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WE have lately experimented with the "direct black print paper" which is being placed on the market. This is intended as a substitute for blue prints, and its characteristic is that it gives dark purple lines on a white ground instead of white lines on a blue ground. The process is very simple. After the tracing to be reproduced and the paper have been put in the frame and exposed for ten minutes or so in the sun, all that is required to develop the print is to pass it through a water bath. The price of the paper is not very much greater than blue print paper, and its advantages over the latter are obvious. It is a commodity which engineers and architects have long desired. We are not told with what chemical the paper is treated, but on experiment it appears to be an organic compound which is precipitated in the form of a purple powder when exposed to the water bath, and which is bleached to a soluble colorless compound by the action of the sun. Though apparently an organic compound the resulting print is permanent and does not alter after it comes from the bath. It is suitable for photographing from, and in this respect is more convenient than the "blue print."

THE PIG IRON OUTLOOK.

The decrease of stocks during the month of September was more than three times as great as the increase in output, the figures being, respectively, nine per cent. and 2·87 per cent. As published in this journal last week, the decrease of stocks was from 938,000 to 853,000 tons, while the increase of output was from 154,128 to 158,700 tons. Even at the rate of three tons of decrease to one ton of increase it will take some time for the establishment of a normal equilibrium between output and consumption. The decrease in stocks is especially noticeable in the Shenango and Mahoning valleys, less so among the Southern furnaces, and but little in the Hanging Rock Region and in Illinois.

The percentage decrease is as follows: Shenango Valley, 28·80; Mahoning Valley, 13·00; Southern furnaces (Alabama, Tennessee, Virginia and Georgia), 5·00; Hanging Rock, 3·25; Illinois, 0·69.

The excessive stocks still held, coupled with the increase of output, small as this is, would seem to indicate that prices will not experience an immediate advance. At the same time it does not appear likely that they will go still lower. There are many indications, slight, perhaps, when taken singly yet important when considered together, that incline us to the opinion that if there is any material change during the next few weeks it will be in the direction of a stiffening of prices, instead of a continuance or a weakening of those now ruling. The cholera scare, referred to in our issue of September 10th, is now happily past, and there does not seem to be any thing in the political situation to warrant an apprehension that possible changes in the tariff may react upon the iron business as a whole.

So far as the Southern furnaces are concerned at this time, they show the same disposition to hold their stocks as they have shown for the last two or three years. They hold their iron somewhat longer than the other furnaces, for at the close of 1890 they held 7·64% of their output as against 6·38% for the rest of the country, and at the close of 1891, 8·80% as against 6·80%.

It is possible that the holding of stocks, outside of the Shenango and Mahoning valleys, if it can be persisted in, will have before long a salutary effect upon the pig iron market. This, however, can not be said to be very perceptible as yet, whatever the future may reveal.

In the meantime it will depend upon circumstances whether or no buyers should take advantage of a market characterized by this holding of stocks and increasing production.

If the production should remain at its present point and the consumption proceed in its present ratio it would require but a short time to establish an equilibrium, for the state of the iron market is not measured solely by the actual difference at any one time between production and consumption, there comes into play also the factor of rapid increase of production on the part of furnaces that can make iron profitably at prices then ruling, and this must always be taken into consideration.

THE HISTORY OF A PLACER MINE—THE LEMHI GOLD PLACER.

A little over a year ago the Lemhi Gold Placer Company was organized to work certain placers on the Salmon River, in Lemhi County, Idaho. These placers had not been worked, although placer mining had been in operation on the Isemon River for 80 years, and had lain idle until time and the man came in the shape of W. S. PATTERSON, an old California miner it is said, with a nose for gold, who discovered what many people considered worthless property was in reality very valuable. Knowing the readiness of Colorado people to embark in a promising mining enterprise, he journeyed to Denver and interested JAMES TEMPLIN in the affair. Together they proceeded to the mine, examined it, and on their return to Denver succeeded in interesting Messrs. BOAL & JACKSON, lawyers, and H. E. WOOD, assayer, in the concern. The quintette purchased 160 acres of land for $20,000, and located considerable high ground back of the bars

This property, which in all had not cost them over $40,000, they pro-

ceeded to incorporate, issued an extravagantly rosy prospectus and began the sale of 1,000,000 shares of stock of the par value of $5 a share for $1 each.

If the stockholders should receive but a small percentage of what was promised them they would all quickly become millionaires. Nevertheless, a number of the promoters and promisers promptly disposed of their holdings for the comparatively trivial amount of $1 per share. Among these was TEMPLIN, who sold his one-eighth interest for $30,000—a sad exhibition of lack of faith in his own prospectus promises.

The public subscribed largely; all the stock offered was bought up and the shareholders were of course confident that they would receive large dividends. The management began work; a long ditch was needed which absorbed a large amount of money. The location, seventy miles from a railroad. was found to lead to heavy expenses, and finally the working capital was found to be exhausted and the company $100,000 in debt.

Then the management had to stand the complaints of disgusted stockholders. This was the history of the Lemhi Gold Placer Company up to October 4, when a reorganization was effected by Messrs. J. J. Hagerman, ex-Governor Grant and D. M. Hyman, who agreed to take 166,666⅔ shares of a new company, with $500,000 capital in shares of $1 each, pay in $125,000, therefor, the money to go into the treasury as working capital.

The old stockholders are to give up ten shares of the old stock for 1⅓ shares of the new, and are further permitted, after getting a little over a dollar for each ten invested, to buy 100,000 shares new stock at 75 cents each. The other 100,000 shares are to be placed in the treasury.

The new organizers are men of undoubted ability in mining operations. They commenced well by employing the eminent expert, A. J. Bowie, to examine and report on the property, and on his recommendation this organization was effected. We understand Mr. Bowie believes the property capable of earning large dividends, though he utterly rejects as pure moonshine the early promises of the original promoters. Most of the work done was unsuitable and the money was wasted. Under Mr. Bowie's advice the mines should become important producers and probably dividend payers.

THE SEVEN STARS.

The novel form of the prospectus of the Seven Stars Gold Mining Company, and the manner in which it has has been brought before the public by wide-spread advertizing, like a patent medicine, has caused an unusual amount of public attention. I have been asked by private correspondents to "expose" the scheme as a "fraud," and I notice in the New York *Herald* of recent date, two columns of destructive criticism upon the scheme, conveying the imputation of dishonesty in its promoters. The style of the company's announcement invites and warrants, perhaps, such suspicions.

But it is not necessarily, on that account, a fraud. The newspaper critic rests his case, apparently, on the proof that the vendor and the company are practically Mr. H. H. WARNER, of Rochester, a man who has become rich by the sale of a proprietary medicine. That the enterprise is practically a speculation of Mr. WARNER'S is clear. It was not necesasry to prove that fact by ingenious analysis or detective inquiry. It was notorious already.

Mr. WARNER offers his personal guaranty, backed both by the deposit of securities and by his whole fortune besides, for the payment of 15 per cent. annually in dividends upon a certain amount of stock, and for the repurchase at par at the end of two years of any part of the said stock which the holder may then desire to sell. I see no reason to doubt that this offer is genuine, or that Mr. WARNER is amply able to make and to fulfill it.

Moreover, on the strength of accounts received from disinterested parties (among them one who tried to purchase the property, but was too late), I believe the mine to be undoubtedly valuable, and to have been (very probably with a view to its sale) so developed as to permit the estimate by competent experts, with reasonable confidence, of a large aggregate gross value of exposed and available ore reserves. Moreover, of the engineers who have made reports on this point, one at least is known to me as skillful and careful; and I have no reason to doubt, therefore, that there is in sight in the mine a gross value of, say, $2,000,000. If, out of this, $750,000 can be realized in profits, Mr. WARNER'S promise as to dividends can be kept without any cost to him. As to his other promise, that he will take back the stock at par after two years, it is not likely that he will be called on to redeem it to any considerable extent. No doubt the mine will then be in the midst of its boom of prosperity and promise, and those who hold the stock, with dividends guaranteed at 15 per cent. for the next three years, will scarcely wish to let it go. In point of fact, on the assumption that Mr. WARNER'S guaranty is put in satisfactory shape, the safest operation for an outsider would be to buy the stock, draw 30 per cent. in two years, and then unconditionally sell out. But that is what nobody is likely to do, unless the mine should be shown, within two years, to have no considerable resources beyond what are now in sight; and it is scarcely necessary to observe that such discouraging revelations are not likely to be made in time to inconvenience the principal owner.

The stock to be guaranteed amounts (if all is taken) to $1,000,000 par value, or one-third of the whole capital. It will require $150,000 per annum to pay the promised dividend. No doubt Mr. WARNER and his friends who hold the other $2,000,000 of the stock will go without dividends, if necessary, for the five years. On the other hand, the guaranteed stockholders will not get more than this 15 per cent., unless the whole stock earns more than that. In other words, the mine must earn in a year more than $450,000, in order to pay them more than 15 per cent., whereas if it earns only $150,000, they will get 15 per cent. from it. For it is all the same, whether the dividend of 15 per cent. be paid on the guaranteed stock exclusively, or 5 per cent. be paid on all the stock and Mr. WARNER'S party, getting the dividend on two-thirds, turn it over to fulfill the guaranty of the other third.

Supposing, then, that a single person purchases the whole of the guaranteed stock, and that every promise of the proprietors is kept, we shall see that his account stands as follows:

Original investment	$1,000,000
Interest for five years at six per cent.	300,000
Total	$1,300,000
Per Contra.	
Returned in dividends	$750,000
Interest on dividends (four years on first, three on second, etc.)	90,000
Total returned	$840,000

At the end of five years the net investment of that date would be $460,000. This estimate is in reality too favorable to the enterprise, as compared with ordinary investments drawing annual interest. The interest in the above calculation should in justice be compounded. But that we will allow to pass.

For $460,000 the purchaser then owns one-third of the property. In other words, if his investment is to be a safe one at six per cent., the mine must be worth, at the end of five years, and after all, or nearly all, of the value now visible in it has been removed, $1,280,000.

It may be objected that the $2,000,000 gross value now in sight should yield very much more than $750,000 net profits. I do not think it safe to assume that, although it is quite possible. But the essential point is, will these $2,000,000 of reserves be worked out in five years? On that head, I entertain no doubt whatever. At the end of five years, what can now be seen will be gone. And even if it were so much richer than the expert estimate, and so cheaply mined and reduced, that it yielded in fact $2,000,000 of profit, the purchaser of the guaranteed stock might be no better off; for he would get only 15 per cent. unless all the stock got more; and $2,000,000 is less than 15 per cent. for five years on the total capital of $3,000,000.

Now, is it, or is it not, a wise operation to employ or loan $1,000,000 at six per cent., on good security, for the sake of being obliged to invest $460,000 at the end of five years in the purchase of one-third of a mine which now shows $2,000,000 gross value, and in the hope that after this $2,000,000 has disappeared there will be a present net value of $1,280,000 not now visible? The prospectus declares an expectation that another $1,000,000 *gross* will be exposed by further explorations. But that is not enough.

From what I hear about the property I should not be at all surprised if it turned out rich enough to make everybody's investment in it profitable. But it strikes me that the public is asked to pay too much for that promising possibility.

To conclude, I do not class this scheme as a fraud, because I have no good reason to consider the statements of the prospectus as false, or its offered guaranty as insincere or insufficient. But taking the scheme at its best, it seems to be a frank request that the public shall buy this property at a round figure, and present two-thirds of it to Mr. WARNER. The money returned to investors is not the essential part of the bargain. But even if the guaranteed rate of dividend were earned for ten years instead of five (and the mine were, at the end of twelve years, exhausted), the investment would not be better than an ordinary six per cent. mortgage on good real estate. So the price at which the guaranteed stock is sold seems to me a pretty stiff one for the whole property.

I see nothing dishonest in this calm request addressed by Mr. WARNER to the public. His prospectus tells the story plainy enough; and I am not bound upon present information to denounce him as a scoundrel, because I find his wares too dear. He says if I will give him a dollar now, he will gradually return me seventy-five cents; and he does not pretend to know, any more than I do, what I shall ultimately receive for the rest. I am not a gambler, but if I were, I would not care to use a dollar in order to gamble with a quarter.

R. W. R.

BOOKS RECEIVED.

Tables of Equivalents of Metrical and English Measures, Weights, Etc.; Areas of Right-angled Triangles, with Slopes of ¼ : 1 to 4:1; Frogs and Switches for Varibus Gauges, Etc. By Jno. McGee, C. E. Published by the Engineering News Publishing Company, New Yor., 1892.

CORRESPONDENCE.

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

Who Made the First Gas Copper-Refining Furnace in the United States?

EDITOR ENGINEERING AND MINING JOURNAL:

SIR—The first successful gas copper-refining furnace constructed in this country was built by Mr. William F. Durfee by my advice at Ansonia, Conn., in the years 1881-82.

Yours truly, THOS. EGLESTON.

SCHOOL OF MINES, COLUMBIA COLLEGE, NEW YORK, October 15th, 1892.

The Rochester Mining and Milling Company.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In reference to the statement appended to a communication in the JOURNAL of October 1st, which says that "the United States Depository claim of the Rochester Mining and Milling Company, Ouray County, Colorado, considered a promising prospect but has no merits warrranting a capitalization of $1,000,000." I would say that this claim has passed the state of a prospect and is now a mine. It has over 2,000 ft. of drifts, nearly 300 ft. of connecting shafts, and large stopes of good ore opened up. Fifteen to 20 tons of milling ore, averaging 26 oz. silver per ton are shipped daily to the Skylark mill in Ouray. Besides this a certain amount of shipping ore, carrying from 70 to 120 oz. silver, $\frac{1}{10}$ oz. gold, 8 to 12 per cent. lead is mined. The vein is exposed for over 600 ft. and shows from 14 in. to 4 ft. of ore. A cross-cut tunnel to cut the vein 700 ft. below the upper workings is now in 680 ft. and will cut the vein within 200 ft.

On the Highland Chief and Lassie claims, belonging to this company, there is at least 500 ft. of development work showing considerable quantities of galena and gray copper ores. The pay streak averages over two feet thick and mill runs have shown as high as 118 oz. silver, half-ounce gold and 30 to 60 per cent. lead. About all the work now being done is confined to the United States Depository claim, and will be so confined until a mill of 30 tons daily capacity and the cross-cut tunnel are completed. When this is done the other properties will be developed. It is true that the company is capitalized at $1,000,000, but one half of the stock is in the treasury. The reports of experts claim half the valuation to be in sight. H. E. WRIGHT.

OURAY, Colo., Oct. 16.

MUKAI ON MANGANESE STEEL.

Written for the Engineering and Mining Journal by Henry M. Howe.

Tetskichi Mukai, of Tokio, Japan, has examined chemically in the laboratory of Professor Ledebur at Freiberg, and microscopically in that of Professor Martens at Berlin, two samples of manganese steel, and, for comparison a third piece of steel falsely called manganese steel, and actually containing only 0·6% of manganese! Such steel as this last is sold in Germany as manganese steel, which is rather annoying, as the metal has none of the characteristics of true manganese steel. Of the two bars of manganese steel examined by him, one contained 12·3% of manganese and the other 10·6%.

His examination* appears to aim principally to discover the reason of the remarkable toughening which sudden cooling produces in manganese steel, changing it from a brittle to an extraordinarily tough substance.

1. The specific gravity of manganese steel in the suddenly cooled state is apparently greater than that of the slowly cooled steel, while the opposite, in general, holds true of other steels. (The density of the 12% manganese steel was not actually appreciably affected by the sudden cooling. The specific gravity of the 10·6% manganese steel was raised from 7·909 to 7·971 by sudden cooling. The density of this latter sample is thus considerably greater than is common in carbon steel. H. M. H.)

2. The hardness of the suddenly cooled manganese steel is greater than that of the slowly cooled, just as in the case of common steel.

The hardness is (according to Mukai) apparently conferred by the hardening carbon. That is to say, the suddenly cooled steel contains a rather large proportion of mother metal, with which the hardening carbon is alloyed and through which chiefly the hardness of the iron is increased. Sudden cooling increases the hardness of manganese steel incomparably less (than that of common or carbon steel. H. M. H.)

The content of hardening can be determined by analysis and the proportions of the hard mass and the mother mass can be observed microscopically.

3. The content of cement or non-hardening carbon is rather large in manganese steel. This, perhaps, is partly due to the large proportion of manganese steel present. It is the rôle of manganese, as has already been shown in different ways, to increase the proportion of the so-called chemically combined carbon.

But manganese does not alone increase the proportion of combined carbon, but more especially it favors the retention of the carbon in the condition of cement or non-hardening carbon in all cases. The more cement carbon there is in the iron the softer the iron is.

4. The characteristic features of the structure of manganese steel are the parallel dark plates on its surface, which are surrounded by the mother mass. These appearances are often observed in iron rich in manganese. It is especially to be remarked that the parallel plates are prominent in iron in which there is much manganese, and that they are not to be observed in common steel.

5. Although the size of the grains cannot be measured microscopically (for the purpose of this comparison. H. M. H.) because it differs in the same piece, yet one clearly sees under the microscope that the grains of the suddenly cooled manganese steel are greater than those of the slowly cooled. This has hardly been observed in common steel or iron. On the contrary, the structure of hardened common steel should be finer than that of the slowly cooled metal. This peculiarity may be regarded as one of the characteristics of maganese steel.

6. The ductility and malleableness of suddenly cooled manganese steel cannot be attributed to the condition of carbon, for the carbon behaves as in common steel. That is to say, when suddenly cooled the proportion of hardening carbon is greater than that of the cement carbon. This of course makes the steel harder. This can be verified by (a direct examination of) the hardness, but we must bear in mind that manganese appears to favor the retention of carbon in the condition of cement carbon. The ductility should probably be attributed to the molecular condition, which can be observed in examining the structure. But it is still uncertain whether this is due to the manganese.

The above is a rough rendering of Mukai's words.

He seems to lay considerable stress on the supposed power of manganese to cause iron to retain its carbon in the cement or non-hardening state. But his own data seems to question the existence, or at least the scope, of this power. Thus we find that only a comparatively small proportion of the carbon in his two slowly cooled samples of manganese steel is in the cement state, in one case less than half, and in the other only 64 per cent. Whereas in his own slowly cooled common or carbon steel no less than 94 per cent. of the carbon is in the cement state.

* Studien über chemisch-analytische und mikroskopische Untersuchung des Manganstahls, von Tetskichi Mukai, aus Tokio, Japan. Craz & Gerlach, 1892.

THE ELIMINATION OF SULPHUR FROM IRON.*

By J. E. Stead, Middlesbrough.

(*Continued from page* 364.)

Removing Sulphur from Iron in the Blast Furnace.—The following general facts have been so often verified that they may be accepted without doubt: 1. That when sufficient lime is present in the furnace charge to combine with all the sulphur and silica, the temperature being sufficiently high, practically all the sulphur will be found in the slag, and little or none in the metal. 2. That if other things remain constant, as the temperature falls, so as to result in pig iron of closer texture or higher number, the sulphur gradually increases with the increasing number till eventually, when the temperature of the furnace is just sufficient to melt the iron reduced, the greater part of the sulphur will be found in the pig, and little be present in the slag. 3. That the more basic the slag the less sulphur will eventually be retained in the pig iron. 4. That if manganese is charged with the materials, and if the temperature is high enough, less sulphur will pass in the iron and a proportionately greater amount be found in the slag. Mr. Parry, of Ebbw Vale, was, I believe, the first to notice this fact, and it has since been constantly taken advantage of in producing basic iron in the Cleveland and other districts.

Practically all the sulphur charged into a blast furnace in the ore, before it reaches the hearth, must at one time during its descent have combined with the iron. The experience of various investigators which follow, therefore, bear upon the effect of heating together sulphide of iron, or iron containing sulphide, with the various substances which are always present in a blast furnace.

The result of Sir Lowthian Bell's memorable experiment of smelting soda-tank waste with iron ore and coke at low and high temperatures shows us very clearly that at first, when the temperature is low, sulphide of iron must be formed, and that if the temperature is increased in contact with carbon, the iron separates from the sulphur and forms cast iron, the sulphur uniting again with the calcium. Percy ("Iron and Steel," page 37), describes an experiment in which he proves that sulphide of iron, heated at a very high temperature with lime or baryta and carbon, produces sulphide of the alkaline earths and cast iron.

The same author states that iron sulphide and pure iron unite in very variable proportions, and gives the results of experiments in which homogeneous products containing about 9·96% and 14·95% sulphur were obtained by melting together sulphide of iron and iron-wire (p. 33). He likewise says that steam decomposes when heated in presence of sulphide of iron, sulphureted hydrogen being disengaged (p. 35). He states that when sulphide of iron was heated to whiteness for two and a half hours with charcoal, a small globule of metal was reduced, which was equal to about 6% on the total iron treated. In a second experiment, the globule produced by heating the sulphide to whiteness for three hours contained 9·41% silicon and 89·53% iron, and evidently a considerable quantity of sulphur, for sulphureted hydrogen was evolved on treating it with hydrochloric acid. Now, as there was such a large quantity of silicon in the button, we must assume either that the sulphide was not pure, or that the charcoal used as a lining to the crucibles must have contained silica; the experiment could not therefore represent the effect of C or FeS.

Karsten, on repeating Percy's experiments, states that sulphide of iron is not changed by fusion with carbon. Now, as the two authorities differed so much, I thought it necessary to repeat the experiment a third time. A crucible was therefore brasqued with lampblack, and about ten grammes of sulphide of iron were placed on the bottom; this was covered with lampblack, and over the whole a fireclay lid was placed. The crucible was heated to whiteness for an hour and a half; when cold the crucible was found to be nearly melted away with the intense heat, but no trace of metal could be found, and the sulphide had apparently not suffered any change. The following analyses indicate the composition of the sulphide before and after fusion: Iron, before, 74·8%; after, 74·3%. Sulphur, before, 25·4%; after, 25·7%.

Now, although my experiment agrees with that of Karsten, I am not prepared to say that it is impossible to produce cast iron from sulphide by heating it with pure carbon, provided the heat is sufficiently intense. It is possible that the temperature employed by Dr. Percy may have been greater than in the other cases. Considering, however, that the temperature was described as sufficient to melt wrought iron, and that only about 6% of the sulphide was reduced in two and a half hours, we must conclude that, excepting under such conditions as are not likely to occur in any practical smelting process, sulphide of iron is incapable of being reduced by carbon alone to the metallic state.

The next question is, if carbon is incapable of reducing sulphide *per se*, has it the power of removing sulphur from cast iron containing sulphide of iron dissolved in it? Percy answers the question by making an experiment in which white cast iron was fused under charcoal for one and a half hours at a temperature sufficient to melt wrought iron. The result

* Paper read before the Iron and Steel Institute September 22d, 1892, and since revised by the author.

given was as follows: Sulphur, *before*, 0·78%; *after*, 0·34%. The white iron was converted into mottled. Mr. Edward Riley converted white iron into gray by heating it in a crucible lined with retort carbon, and the sulphur was completely removed. Both Percy and Riley agreed to a certain extent; but the removal of sulphur is not so perfect in one case as in the other.

An experiment made in my laboratory, using a crucible lining of pure lampblack instead of impure carbon—such as charcoal or retort carbon, both of which might contain bases capable of combining with sulphur—in which white pig iron low in carbon was kept fluid in contact with carbon for one and a half hours at a white heat, resulted in no elimination of sulphur whatever. The same result was obtained when wood charcoal was substituted for lampblack. The sulphur in the metal was 0·51 per cent., and 0·51 per cent. was found after treatment. There can be no doubt as to the correctness of the analyses, as the sulphurs were determined by two different methods with concordant results. Here, again, my results do not agree with those of other observers, and it would appear as if very slight differences in the conditions under which the experiments are conducted greatly modify the result.

My experiments were made at a temperature above that of the hottest product of any blast furnace, and if the heat was greater than this in Percy's and Riley's trials, and if the difference in our results was caused by greater temperature being employed in the latter, we may assume that the lower degree of heat approximated more closely to what is obtained in blast furnace practice, and that therefore in the reactions which occur therein carbon, *per se*, has little effect in expelling sulphur from iron This conclusion, however, cannot be accepted as final until it has received considerably more attention. The iron used in my trials contained nearly two per cent. of phosphorus, but we fail to see how that would influence the result.

(*To be continued.*)

MECHANICAL NOTES.

Written for the Engineering and Mining Journal by Albert D. Pentz.

A large proportion of the cutting points on a file never do actual service of any kind. On a new file the work is done by the very few highest points, then as these are broken off and worn down others do some service. These last, however, do not have a chance to do much service, being withheld by the worn and dull points from effective contact with the metal. Files again are cut with such blunt tools that their cutting points have no satisfactory backing of material. This backing always is a concave fillet, giving the point great sharpness but no strength. These facts indicate the need of an improved means of making files, or perhaps the finding out of the method by which the Swiss cut their famous Grobet kinds. One of these Swiss files will outcut and outwear four American files; an English Stubbs file will outwear more than two American files, but they are not so evenly cut as the Swiss. It is not solely in the cut that these foreign files are better than ours. They put in honest steel. One maker of files told me what make of steel he used. It is believed that this steel can be bought for less than 4c. a pound by the ton. The Swiss files again, and the Stubbs files also, in a degree, are better finished tools than anything of the kind made in America. A Grobet file is generally about mathematically correct. The hardening in both these foreign files is uniform and good. Year after year, decade after decade, these files come to us. They were the best in the world at the time I entered the door of the first shop that knew my efforts, and they are the best to-day. Now what is the matter with American files? Our steel is good, we have the mechanical ability, and we have the market, for we use more Swiss files than all the rest of the world, and I am of opinion that we consume more Stubbs files than the whole of the British empire. Americans do not need to be ashamed of many kinds of native metal work, but our files are below comparison.

There was a grand demonstration at Bunker's the day the American Suction Company was formed. Things that everyone knew to be facts were disproved, and the laws of Nature were cuffed and buffeted about without the least respect. Bunker had designed a pump; the construction of which does not matter so much as what it could do. When he tried his pump he found that it could elevate water to the third story of his shop, which was where the pump was placed. The height, from the surface of the tank that was being pumped from to the pump, was 35 feet 6 inches, average. The suction was through a three-inch pipe, nearly vertical except where it came into the building. Bunker, appreciating that water falling so far from the pump back to the tank would be blown about by the wind, the tank being in the yard, arranged a pipe 6 inches in size from the discharge back to within four feet of the surface of the water in the tank. Both these pipes were well fitted to the pump and everywhere else throughout so that there could be no leak to injure the machinery in the shop by wetting it. The lower end of the discharge pipe had a reduced nozzle and a globe valve attached to it so that when the pump started this valve could be opened and the effects from the pump be seen at once without waiting for this pipe to fill. It may be as well to mention peculiarities about the suction pipe to the pump. Its lower end in the tank was provided with a half turn terminating upward, having a radius of perhaps 12 inches, and its open end was about 18 inches under water directly below the nozzle of the discharge pipe, which was less than six feet above it. It also was provided with a globe valve a convenient distance above the tank, which valve was always closed when the pump stopped. The gentlemen whom Bunker had interested in his pump were men above the average in intelligence, and were well informed. They knew that water usually could not be pumped by suction higher than 30 feet, and they were on the lookout. One of them dropped a tape line and measured the height of the suction pipe. He found it even higher than Bunker had stated. The water in the tank was clear, so that the suction could be seen distinctly. The body of the pump was honestly mounted, and there absolutely was nothing very peculiar about the whole thing. Bunker, in a little speech, stated that he would let the pump talk for itself. It was placed higher above the tank than theory held it possible to pump by suction. He had no counter theories but the pump had facts. It was possible that the old theories were based on the performances of pumps built on the old principle. However that might be, the gentlemen could now see for themselves what this pump could do. He then blew a whistle; one workman grasped the valve wheel on the suction pipe and another one grasped that on the discharge pipe at the nozzle. Bunker then threw in the clutch to start the pump, which made a part revolution and stopped. This caused the belt to squeal terribly. When the workmen at the globe valves heard the noise of the belt they opened both pipes. A stream from the nozzle shot down into the tank, the squealing stopped, and the pump moved silently and effectively. In answer to a question about siphonage Bunker explained that a siphon would fail at the same point that a suction pump failed. If the column of water in the inlet pipe was heavy enough to create vacuum it would do so whether the device were a pump or a siphon; which is a fact. When the trial was completed to the satisfaction of all, the pump was stopped. One of the gentlemen said on leaving, that "theory has been getting some hard blows lately." Bunker bowed and smiled.

The above roughly indicates the methods employed in a number of mechanical swindles that have come to my notice in many years of experience. This manner of fraud will not cease until intelligent capitalists stop being experts in everything and anything except finance. If they prefer to trust to their own smartness when they investigate mechanical devices rather than employ a competent expert, they may save five hundred dollars and lose twenty-five thousand. As it is, ingenuity exercised as in the above hypothetical case often pays better than that devoted to the invention of useful machinery.

Several recent writers have spoken of the development of machinery and tools by which the economy of manufacture has been advanced so far that most articles at this time are made for a fraction of their cost forty years ago; and in speaking of this development they have called it "science." It is not my purpose here to deny the truth of this definition, and in fact it may be a very good one, for 'science' is a broad term. These writers, some of them, again indicate that this science which improves machinery is taught in the scientific schools and that graduates of these schools are better equipped to improve machinery than men who have practical science alone. I deny this, and on the contrary I assert that the practical men are the better accoutred, and hold myself ready to show that so much of mechanical progress is due to men who have designed from practical knowledge alone, that the volume of their addition to the arts overwhelms the contributions from all other classes, and, further, that the contributions to the arts by those fortified by school science alone are few and not significant. In making these assertions, do not understand me to deny that school science is to be ignored, or that I have anything but the greatest of respect for it as the complement of practice, but having some acquaintance with both there is no hesitation felt in stating that the suggestions and impulses toward invention come from practice and a familiarity with the actual arts, without which mechanical speculation is an immaterial figment of the imagination alone.

BLOWING IN No. 1 FURNACE AT ENSLEY, ALA., ON A NEW LINING.

In Vol. I., No. 2, Proc. Ala. Industrial and Scientific Society, Jno. S. Kennedy, late Superintendent at Ensley, has this to say about blowing in No. 1 furnace there in 1890: "This furnace, as originally built (1887-1888) had a total height of 80 ft., a bosh of 20 ft. and a hearth of 11 ft. diameter. The bosh was located 37 ft. above the hearth, much higher than advisable. When remodeled by the writer, the bosh diameter was reduced to 19 ft. in order to lower the bosh to a point 28 ft. above the hearth level, as it was impossible to alter the bosh angle without expensive changes in the wrought iron jacket. The bosh lining was protected by 1¼-in. horizontal coils of the Hartman pattern.

"The furnace was well dried by nearly a month's hard firing, and the stoves were heated by gas taken from the adjoining furnaces. That the stoves were well dried and warmed is shown by the first temperature being over 800°. This was no disadvantage, as it enabled a rapid increase to be made in the engine revolutions, and no difficulty was experienced in holding the stoves at the desired temperatures. The hearth was filled with a strong cribbing of cord wood and a layer of split pine wood was laid across the furnace at the tuyere level. On this three lengths of cord wood were stood on end; as only pine wood was obtainable, it was thought better to use three lengths instead of two. On this was next filled the fuel blank of Pratt coke; 22,000 lbs., being filled without any limestone, and 78,000 lbs. with 12% of stone. The burden was composed of equal parts of hard and soft ores, and sufficient stone was added to form a slag containing 36% silica, allowing for 2·50% silicon in the iron.

"The first cinder flushed contained 35·41% silica. The first seven charges filled contained: coke, 6,500 lbs.; ore, 4,000 lbs.; limestone, 980 lbs. The burden was raised every seven charges, until the last charges filled consisted of 6,500 lbs. coke, 8,700 lbs. ore, and 2,000 lbs. limestone. A small piece of greasy waste was placed in the front of the nose of each tuyere, and when everything was ready 7,000 cu. ft. of blast was turned on through a hot stove. In less than two minutes all the tuyeres lighted, the temperature of the blast being 820 degrees. The heats were ordered to be kept at 800 degrees, and the revolutions increased gradually until at the end of the first 24 hours the furnace was receiving about 16,000 cu. ft.

"Owing to the favorable auspices under which the furnace was blown in, the dry condition of the stock and the excellent soft ore accumulated while relining, it was thought best to increase the burden before waiting for the first cost, a procedure which was justifiable, as the first iron was soft.

"Cinder was tapped fourteen hours after lighting, and was hot, grey and fluid. The first cast was run sixteen hours after lighting and contained 17½ tons Nos. 1 and 2 soft iron. The first complete furnace day, 84 tons, 2,400 lbs. to the ton, were made, 80% foundry iron; the third day 142 tons were made, and on the sixth day 155 tons, of which 108 tons were foundry iron. By this date the furnace was carrying a burden of 6,500 lbs. coke, 2,700 lbs. stone and 11,680 lbs. ore."

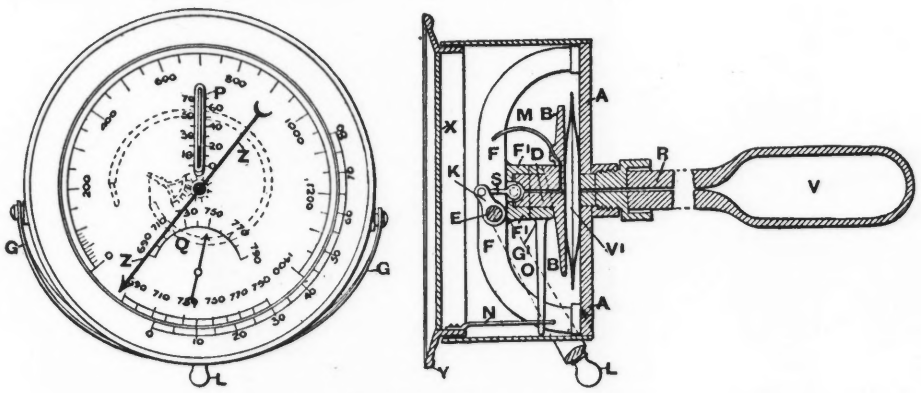
Mr. Kennedy is now superintendent of the new Glasgow C. & I. Co., Ferrona, Pictou Co., Nova Scotia.

WIBORGH'S AIR PYROMETER.

In our last issue we gave a short abstract of a paper on the Wiborgh air pyrometer, read by Mr. Emanuel Trotz, before the American Institute of Mining Engineers. We now give a full description, with the assistance of cuts, of this important and promising instrument. It is capable of indicating with exactness up to a temperature of 1,400° C. The principle on which it works is as follows: A volume of air V is allowed, while in communication with the atmosphere, which has a pressure H, to assume a temperature T, which is to be determined. Communication with the atmosphere is then cut off and another volume, V_1, of known temperature, t, and also of atmospheric pressure H is forced into the volume V. The increase h in pressure arising from this operation is a measure of the temperature T. By calculating from the law of Boyle & Mariotte the formula $T = \frac{V h - V_1 H}{V_1 \alpha H} + \frac{h V t}{V_1 H}$ is obtained, where α = the coefficient of expansion of the air. If t is put equal to 0 then an expression on which a temperature scale can be based is obtained, and if T is put equal to O a zero line varying with H is obtained.

The volume V is inclosed in the porcelain globe V and capillary tube R. This space communicates with the interior of the collapsible metal chamber V_1 containing the extra volume of air to be forced into V. A passage through the stem D opening out of the chamber V_1 at the opposite side to R communicates with the atmosphere, and thus V and V_1 are usually under ordinary atmospheric pressure. After the temperature t of V_1 has been ascertained from the thermometer P, the opening of the capillary passage in D is closed by the piston S, which is actuated by the arm K, axis E, external forked lever G and handle L. On pressing the handle L further, the stem D is forced against the chamber V_1 and thus the air inside it is forced into R and V. The increase in pressure thus caused is transmitted through the lead tube M to a manometer by which the dial pointer Z is deflected. The reading given by this pointer is the temperature T.

As this is a direct reading it is evident that preliminary adjustments have to be made to correct the reading for t and H. For the temperature this is done by increasing the volume V_1 to $V_1(1 + \alpha t)$, and for the atmospheric pressure the same thing is done, reckoning 78 millimeters of pressure equivalent to 30° C. A special piece of mechanism is employed for varying the volume V_1. A movable ring G_1 is interposed between the plate B and the shoulder F_1 of the fixed bridge F; the outer end is plane and its inner end is helical. When the front Y of the case is turned round according to a scale upon it, the lever N deflects the arm O attached to the sleeve G_1, and presses the plate B more or less against the chamber V_1 and thus varies the volume of air contained in it. By aid of the scale on the bottom of the fixed dial the correction is also made for the barometric pressure which is indicated by the aneroid Q. After these two preliminary adjustments, all that has to be done is to pull the handle L upward and to hold it there until the pointer Z comes to rest.

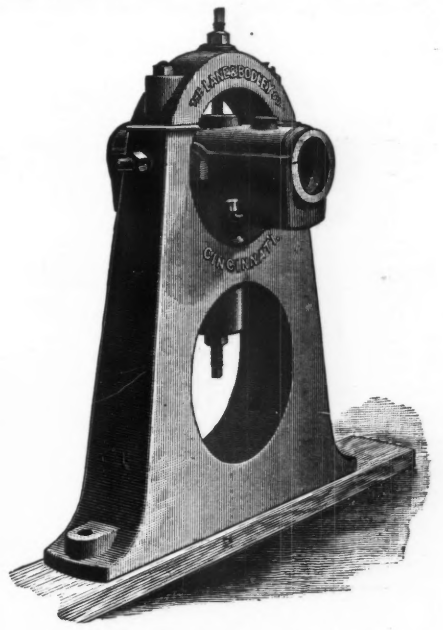


WIBORGH'S AIR PYROMETER.

Glucinum and its Properties.—In a late issue of the *Revue Industrielle*, Mr. Ph. Delahaye writes entertaingly of a recent article by Mr. R. A. Fesenden, in which he advocates the more extended use of glucinum, and even predicts for it a greater future than for aluminum. This metal was named glucinum by the French chemists on account of the sweetish taste of some of its salts; it is also called beryllium, because it was first detected in the beryl. The oxide of the metal was first isolated by Vauquelin in 1798, and the metal itself by Wöhler in 1829, who prepared it by fusing the chloride with potassium. He obtained it as a dark grey powder which, by burnishing, took on a metallic lustre. It remained for Debray, that most fertile inventor of processes, to obtain the metal in a coherent state. This he did by bringing the vapors of the chloride and of metallic sodium together in a current of hydrogen. The metal so obtained is silver-white and does not decompose water even at a red heat. Its atomic weight is 9.1 and its specific gravity 2.1. Its rigidity, as compared with iron, is as 1,350 to 750 at 10°C. Its resistance to elongation is 65 kilos, as compared with 47.7 kilos for a wire one millimetre in diameter. Its electrical conductivity is equal to 105, that of silver being 100. In regard to its price so much can not be said: According to Mr. Fesenden, 5% glucinum ore can be bought for 24 cents per pound, or at the rate of $4.80 per pound of glucinum. In regard to its manufacture, he states that Castner's method of making aluminum does equally well for glucinum, and that estimating on a yield of 50%, the metal can be manufactured for about $15 per pound. There is undoubtedly much conjecture in this, but even so it is interesting and worthy of attention. The principal glucinum containing minerals in this country are the beryl, bertrandite and phenacite.

SHAFTING STAND FOR HIGH-SPEED ENGINES.

A new and convenient shafting stand has just been placed on the market by the Lane & Bodley Company, of Cincinnati, O. As will be seen from the accompanying illustration, the length of the bearings is made four times the diameter of the shaft. The bearings are held in place by four screws, two horizontal and two vertical, so that the shaft can be easily aligned, and the oil boxes may be removed without disturbing the shaft. The bearings are lined with special metal and are lubricated by a self-oiling chain feed. All who have had experience with high-speed engines will understand the advantages of this shafting stand.



HIGH SPEED SHAFTING STAND.

THE OUTPUT OF PIG IRON IN GREAT BRITAIN DURING THE FIRST HALF OF 1892

The statistics of the pig iron production in Great Britain during the first half of 1892 have just been issued by the British Iron and Steel Association. As was to be expected the effect of the protracted Durham coal miners' strike during the early months of the year has had a tremendous influence in decreasing the output of those iron producing districts which were dependent on their supply of coke from Durham. Compared with the first half of 1891, when the output was 3,712,387 tons, the production during the first half of the present year, viz., 2,790,918 tons, cuts a very poor figure, being in a minority of 921,469 tons, roundly 25 per cent.

At the same time, however, it must not be overlooked that on the 30th June, 1892, the stocks were 595,122 tons lower than on the 30th June, 1891. There is little doubt, however, that the British iron trade has shrunk a little irrespective of the strike, and that it is entering on a period of depression. The districts of Cleveland, Cumberland, show the greatest decreases of output, and, in fact, Cleveland shows a falling off of over 50 per cent. Scotland, on the other hand, shows a very satisfactory increase.

Compared with the previous half years the first half of 1892 shows off badly, as will be seen from the following table:

		Tons.			Tons.
January-June,	1887	3,668,115	January-June,	1890	4,168,464
" "	1888	3,902,804	" "	1891	3,712,787
" "	1889	4,083,597	" "	1892	2,790,918

The most important decrease of stocks during this last half year are shown as follows:

	June 30, 1892.	June 30, 1891.	Decrease.
Cleveland	108,493	392,206	283,713
Cumberland	44,653	190,740	146,087
Scotland	426,441	512,116	85,675
Lancashire	11,426	35,624	24,798

In every district throughout the United Kingdom there were decreases

Rapid Electrolytic Deposition of Copper.—At a meeting of the Royal Institution of Great Britain, Mr. Swan obtained a perfectly coherent deposit of copper by using a current of 1,000 amperes per square foot of cathode. The method employed was as follows: In a copper nitrate bath containing a small proportion of chloride of ammonium, two copper plates of 140 square centimeters each were placed at a distance apart of 25 millimeters; then a current of 140 amperes was passed through the plates for one minute. At the expiration of this time a solid electrotype of the cathode was obtained which with the current ordinarily employed would have required more than an hour in its formation.

Liability of Mine Owners.—A decision of considerable importance has recently been handed down by Chief Justice Paxson of the Pennsylvania Supreme Court, in which he reverses the decision of the Court of Common Pleas, awarding damages to Barbara E. Haley in her suit against the Philadelphia & Reading Coal and Iron Company, owner of the Greenback colliery. There was a fire in these mines and her husband lost his life, but it was proved that the fire was due to the negligence of a mine boss. On the point at issue Justice Paxson said: "We have repeatedly held that the owner of a mine is not responsible for the negligence of a mine boss, unless he is incompetent and the owner knows him to be so."

STUDIES IN STRUCTURAL GEOLOGY.*

By Bailey Willis, U. S. Geological Survey, Washington.

During the last seven years the geology of the Appalachian Province has been very fully investigated and the report of the studies will be published shortly in the "Thirteenth Annual Report of the United States Geological Survey." The details of the geology of this district will not be so interesting to mining engineers as to geologists, so I purpose here to confine myself to an account of some experiments which we have conducted with wax models with the object of investigating the formation of synclines, anticlines, folds and faults by lateral and vertical pressure.

The beds of shales and sandstones which constitute this Appalachian Province were probably deposited in an ocean occupying the space west of the older rocks which extend from Eastern Pennsylvania and New Jersey to Eastern Virginia, North and South Carolina, Eastern Georgia and into the Atlantic sea bed. These shales and sandstones vary in thickness from 30,000 ft. at Mauch Chunk, Pa., to 10,000 ft. in Tennessee, Georgia and Alabama. For extent and regularity of composition there is nothing like them in the world. They exhibit over their whole range the results of lateral compression which has evidently acted from Northwest and Southeast, but the effect of this compression varies in different regions.

In the region extending from Lebanon Valley to Chilhowee Mountain in Tennessee their structure consists of numerous short anticlines and synclines closely pressed together. From the Chilhowee Mountain east to Georgia and North Carolina the principal characteristic is cleavage. From the anthracite basins of Pennsylvania to New River, Virginia, the structure consists of open folds, and the southern extension of this district along the strike is characterised by great faults among the folds. This folding and faulting throughout the Appalachian Province was so interesting that it induced us to devise a series of experiments with models in order to ascertain the exact causes of the formations found here. This has been done, of course, many times before, but never to my knowledge have the results and conditions so resembled those of nature.

In starting out on these experiments we recognized the following conditions as necessary: (1) The materials used in the model to represent stratified rocks should vary in consistency from brittle to plastic, according to the depth at which the deformation is supposed to take place; (2) the compression should be carried on under a movable load to represent the weight of the superincumbent strata; (3) the piles of strata should rest on a yielding base, to simulate the condition of support of any arc of the earth's crust. We used wax as our principal material; when mixed with plaster of Paris, a hard brittle substance is obtained, and when mixed with Venice turpentine, it becomes soft, even to the consistency of butter. The load was 1,000 lbs. of shot. Soft mixtures of wax and turpentine were employed as the yielding base. The model was surrounded with shot in order to avoid friction in the pressure box. The compressor was a simple oak box whose sides while bolted together were removable. After the layers had been placed in position they were squeezed up by the slow advance of a piston from one end.

The three accompanying illustrations give the results of experiments with three different models. In Figs. 1 and 2 the illustrations

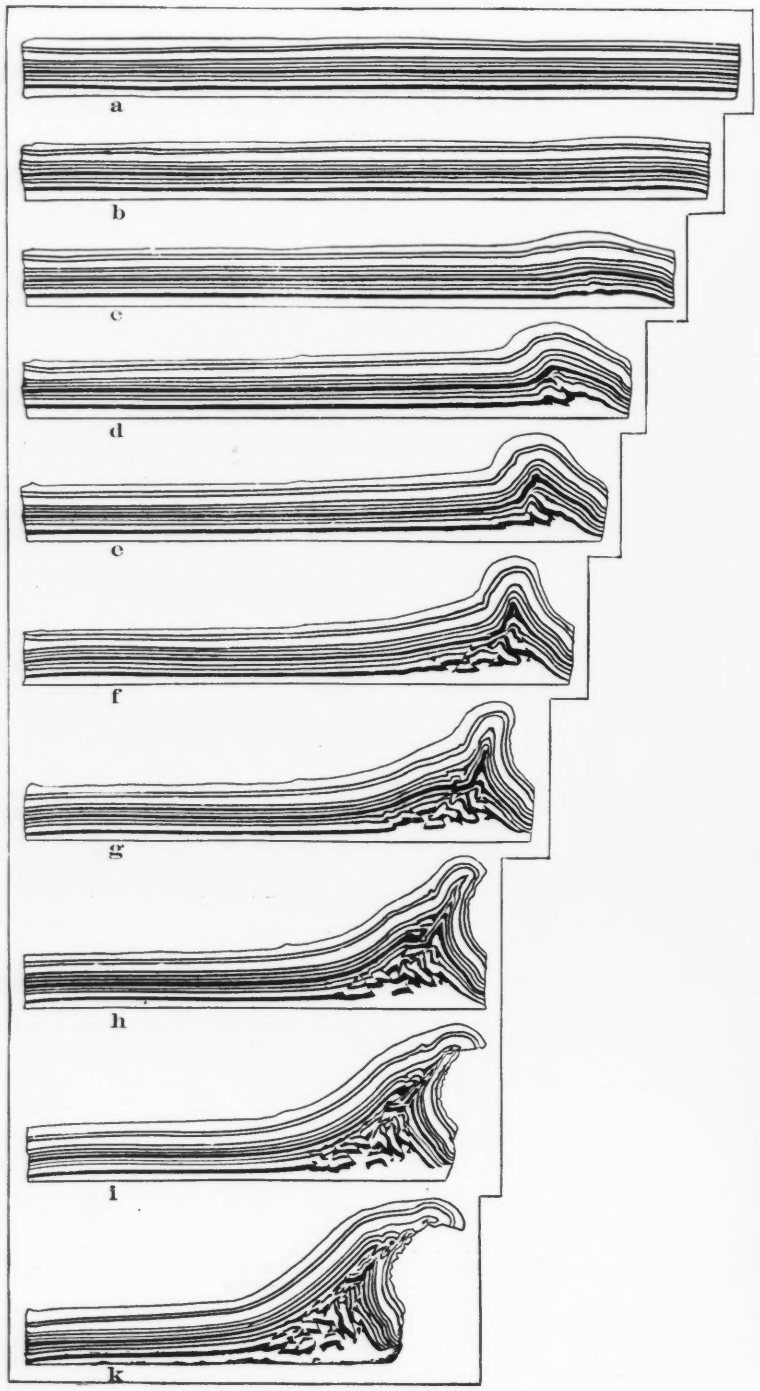


Fig. 1.

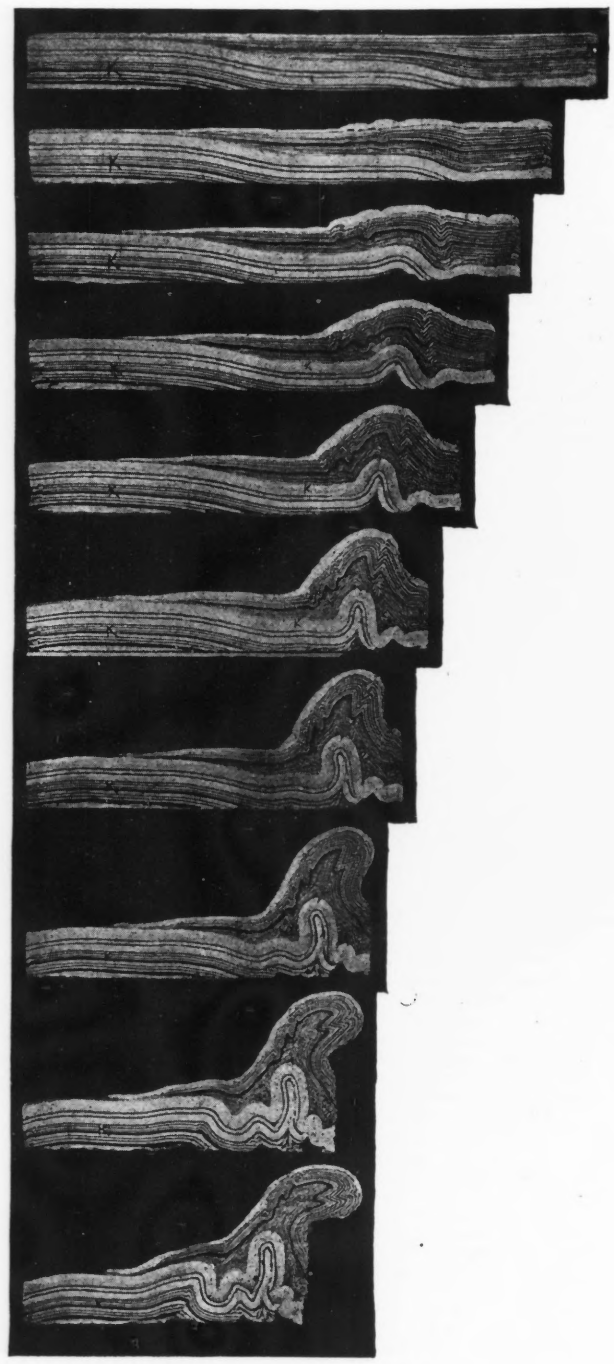


Fig. 2.

* Abstract of a paper read before the American Institute of Mining Engineers, Plattsburg Meeting.

are one-tenth of the actual size, and in Fig. 3 are one-half the actual size. In Figs. 1 and 2 the compression was produced under a load of 1,000 lbs. of shot by a piston advancing from the right. In Fig. 1 the upper five layers were soft and composed of 3 parts of wax, 2 of plaster and 2 of turpentine; the middle seven layers were softer, being composed of 3 of wax, 3 of plaster and 6 of turpentine; the lower seven layers were still softer, being composed of 2 parts wax, 2 of plaster and 6 of turpentine. The harder layers, forming a competent arch, gave the soft base room vertically, to which it adapted itself under horizontal compression by wedge-shaped shearing.

The model represented in Fig. 2 was made to represent a syncline of deposition formed by thinly bedded deposits on a massive layer which rested on a softer base. The massive layer is white in the figures and was medium soft, being composed of nine parts of wax, nine of plaster and four of turpentine; all the rest was soft, as in the upper five layers in Fig. 1. The initial dip determined the anticline; shear faults were developed in the softest material; and overturned dips were produced in the complex folds over the single arch.

Fig. 3 shows shear faults and folds developed in butter-like material by horizontal compression under a weight of 1,000 lbs. of shot. The end near the piston is only shown in this figure.

These illustrations of our experiments are only three out of a great number and it is impossible here to give any detailed account of them. I will, however, give the general conclusions which we have deduced from our experiments as regards their application to the explanation of geological phenomena. 1. When a thrust affects a stratified mass laterally it is transmitted in the direction of the strata and through each stratum, according to its relative inflexibility. At any bend the force is resolved into components, one radial and the other tangential to the dip beyond the bend. The radial component, if directed upward, tends to raise the stratum and its load; if directed downward it tends to depress the stratum and displace its support. 2. A thrust so resolved can only raise an anticline which is strong enough to sustain the load lifted by its development; such an arch we call "competent." Since strength is a function of the proportions of a structure, it follows that for a given stratum the size of a competent anticline will vary inversely as the load, and for a given load the size will vary as the thickness of the effective stratum. Original anticlines, however, which are coextensive with the conditions of deposition may have limits longer than their simply competent arches would have. 3. The superincumbent load borne by a competent anticline is transferred to the supports of the arch at the points of inflection of the limbs. Hence soft strata are thinned on the limbs and thickened on the axes of folds within the competent arch. Thus we may explain the great local thickening of coal beds along anticlines, and the spaces occupied by some large bodies of iron ores along similar lines of relief from pressure, as in the Lake Superior mines. 4. When a competent arch is raised by a thrust from one side the load transferred may so depress the resulting syncline further from the force, that an initial dip will be produced in otherwise undisturbed strata. This dip will rise to a bend from which a new anticline may be developed. This anticline is a result of the first and may be called "subsequent" in distinction from original folds. Since subsequent folds are simply competent structures, their size will be determined by conditions of thickness and load; they also must be parallel to the original folds and to each other. A good example of an original fold and subsequent anticlines is afforded by the Nittany arch and the group of adjacent parallel anticlines which extend northeast from the Broad Top basin.

These laws, besides being of great interest in explaining geological formations, will prove of considerable value to the civil and mining engineer; their application in supplying a theory of the deposits of the Appalachian Province need not be gone into here, as the matter is of no particular interest to mining engineers. It is also impossible in the present paper to give an example of the application of the laws to the planning of underground work, for every case requires a special method of treatment

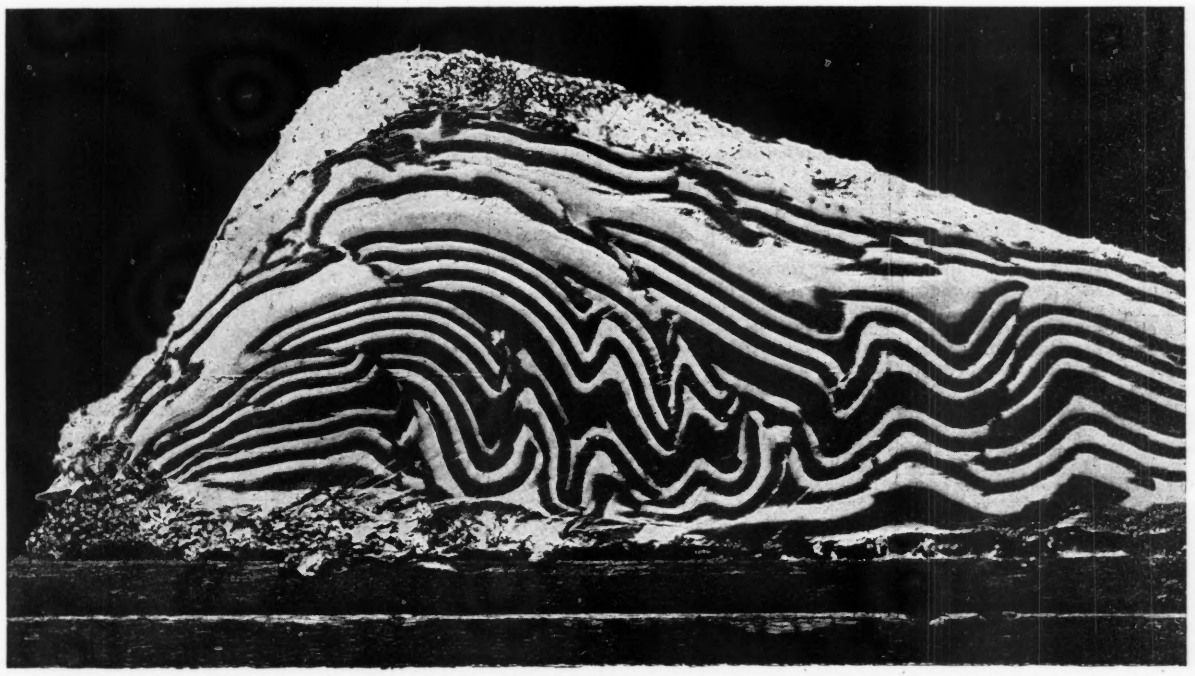


FIG. 3.—STUDIES IN STRUCTURAL GEOLOGY.

THE CHEMISTRY OF THE CYANIDE PROCESS.

Written for the Engineering and Mining Journal by Chas. Butters Ph. B. and John Edward Clennell, B. Sc.

Solubility of Gold in Potassium Cyanide.—That metallic gold is soluable in cyanide of potassium has long been known as a scientific fact. Faraday pointed out that gold-leaf immersed in the solution became so thin that it transmitted green light. Prince Bagration observed (J. pr. Chem. xxxi, 367) that the very finely divided gold obtained by precipitating a solution of the chloride with ferrous sulphate may be dissolved by this reagent. Elsner showed, however (J. pr. Chem. xxxvii, 333), that the presence of oxygen is required for the solution of the gold. A solution is obtained which, on evaporation, yields colorless octahedral crystals of the composition $KAuCy_2$ (auro-potassic cyanide) which may be looked upon as a double cyanide of gold and potassium (KCy.AuCy). The reaction which occurs may, therefore, probably be represented by the following equation:

$$2\ Au + 4\ KCy + O + H_2O = 2KAuCy_2 + 2KHO.$$

There are two interesting points indicated by the above equation which it is well to bear in mind in conjunction with the application of potassium cyanide as a solvent for gold on a commercial scale.

1. That the quantity of cyanide theoretically necessary to dissolve a given weight of gold is infinitesimal in comparison with the weight actually required in practice. Taking Au = 196·8, K = 39·04, and Cy = 25·98, we see that 130·04 parts by weight of potassium cyanide should be capable of dissolving 196·8 parts of gold, or, approximately, two parts of the cyanide should dissolve three parts of gold. The minimum actual consumption in treating free milling ore, assaying, let us say, 10 dwts. per ton, is about 3 lbs. per oz. of gold recovered—roughly, 40 parts by weight of cyanide for 1 part of gold. In the leaching tanks alone a pound of cyanide is generally consumed per ton of material treated.

2. That an extremely small quantity of oxygen is sufficient to bring about the solution of the gold, 15 96 parts being required for 596·6 parts of gold, or one part for nearly 25 parts of gold. The quantity present in a porous mass of tailings, to say nothing of that dissolved in the water used in making up the solution, would be considerably in excess of that actually required for the reaction.*

Decomposition of the Cyanide.—How, then, does it happen that such an enormous consumption of cyanide occurs? In the first place we must bear in mind the great instability of the simple cyanides. Hydrocyanic acid is, from a chemical point of view, perhaps the weakest acid known. It is liberated from its salts by all mineral acids, by carbonic acid, and by all organic acids of common occurrence. Then atmospheric carbonic acid is accountable for a certain amount of decomposition, in which a constant evolution of hydrocyanic acid takes place after the reaction:

$$2\ KCy + CO_2 + H_2O = 2\ HCy + K_2CO_3$$

Then, again, we must consider the proneness to oxidation which the cyanides exhibit, and which, in fact, lies at the base of most of their technical applications. Potassium cyanide readily changes into cyanate, and ultimately into carbonate:

$$KCN + O = KCNO;\ 2\ KCNO + 3\ O = K_2CO_3 + CO_2 + N_2$$

The presence of alkalis, which always occur in commercial cyanide, tends to induce that peculiar and little understood decomposition termed "hydrolysis."† In this reaction the alkali appears to determine a chemical

*The solubility of atmospheric oxygen amounts to about ·006 litre in one litre of water at the ordinary temperature and pressure. Assuming that a minimum quantity of, say, ·0025 litre is dissolved in each litre of 25 tons (50,000 lbs.) of cyanide solution, a quantity of oxygen, amounting to ·175 lb., will be available for bringing about the reaction on the gold. This amount is of course considerably more than that actually required for the solution of the 40 oz. of gold which might be contained in a charge of 75 tons of tailings.

† The decomposition of the solution by "hydrolysis" occurs mainly in the zinc boxes, and seems to be induced by this presence of th metal.

change in which water plays a part, while the alkali itself is not in the least affected. When hydrocyanic acid is treated with concentrated mineral acids or with boiling alkalis, the reaction is as follows:

$$HCN + 2\,H_2O = HCO_2(NH_4),$$

ammonium formate being produced.

The hydrolysis of potassium cyanide, which undoubtedly occurs to a considerable extent when excess of alkali is present in the solution or has been added to the tailings before treatment with cyanide, gives rise to ammonia and potassium formate.

$$KCN + 2H_2O = NH_3 + HCO_2K.$$

The smell of hydrocyanic acid, generally noticeable in the neighborhood of the cyanide tanks, is partly accounted for by the decomposition due to atmospheric carbonic acid, alluded to above. But there are grounds for supposing that in dilute solutions a dissociation of the cyanide takes place, so that what we term a weak solution of potassium cyanide is in reality a mixed solution of potassium hydrate and hydrocyanic acid:

$$H_2O + KCy = HCy + KHO.$$

The truth of this theory is supported by the extraordinary fact that a distillation of hydrocyanic acid takes place when a current of a neutral gas (*e. g.*, nitrogen) is passed through a cold dilute solution of cyanide. This being the case, it is evident that hydrocyanic acid, which is an extremely volatile body, must be constantly disengaged from all vessels in which weak cyanide solutions are freely exposed to the air.

Where the agitation or circulation systems are adopted, the consumption must be still greater, since these methods involve a constant exposure of fresh surfaces.

The tendency of the simple cyanides to form double salts with each other, or with other metallic compounds, must likewise be taken into account. Salts of iron, and to a lesser extent, salts of aluminum, magnesium, calcium, and the alkali-metals are liable to occur in tailings, especially such as have been long exposed to atmospheric influences.

We have said enough to show that, even under the most advantageous circumstances, an enormous waste of cyanide must take place. Some of these losses are doubtless preventible; the use of closed tanks, and careful attention to the purity, both of the cyanide itself and of the water used for dissolving it, would reduce the extent of the decomposition in a very marked degree.

Action of Cyanide on Pyritic Material.—Let us now consider what additional decompositions occur when cyanide is applied to the treatment of pyritic ores or tailings. To understand the action of cyanide on these ores, or the products derived from them, we must briefly describe their composition and the chemical changes to which they are liable. The surface ores of the celebrated "banket" formation consist, as we pointed out in our previous paper, almost exclusively of silica and oxide of iron. These occur in the form of rounded quartz pebbles, imbedded in a softer matrix highly charged with ferric oxide, which imparts its characteristic reddish tinge. The gold is found in this matrix associated with the oxide of iron, or sometimes in small scales on the surface of the pebbles. The pebbles themselves carry little or none. At a lower level this "free-milling" banket passes into an ore precisely similar in structure, but much harder, and containing the iron in the form of sulphide instead of oxide, which gives it a peculiar bluish tint.

There can be little doubt that the free-milling ores have been formed by gradual oxidation of the pyrites through the influence of air and moisture during a long period of time, and in fact we see this same change in progress whenever pyritic material has been exposed to the action of the atmosphere. The first effect observed is the conversion of ferric sulphide into a soluble sulphate, free sulphuric acid being simultaneously produced:

$$FeS_2 + H_2O + 7O = FeSO_4 + H_2SO_4.$$

Certain insoluble basic sulphates, of variable and somewhat complex composition, are gradually formed by the action of air on the ferrous sulphate.

$$2\,FeSO_4 + O = Fe_2O_3 . 2\,SO_3 \text{ (Wittstein).}$$

A certain amount of soluble ferric sulphate is likely to be produced at the same time:

$$10\,FeSO_4 + 5O = 2\,Fe_2O_3\,SO_3 + 3\,Fe_2(SO_4)_3 \text{ (Berzelius).}$$

(basic sulphate) (ferric sulphate)
insoluble. soluble.

The pyritic ores likewise contain small quantities of arsenic, copper, and sometimes cobalt and nickel, but the amount of these foreign metals has so far been so small that they have not practically interfered in the cyanide treatment. We may here note, as a fact observed in the treatment at the Robinson Chlorination Works of pyritic concentrates purchased from the various gold-mining companies, that copper and arsenic seem to occur in gradually increasing quantities with the increasing depth of the working. These elements may in the future be a source of serious trouble in the application of the cyanide process.

Suppose, now, that we attempt to treat a charge of partially oxidized pyritic tailings directly with cyanide solution. The moisture in the tailings has a distinct acid reaction, chiefly due to the presence of free sulphuric acid. This, of course, liberates hydrocyanic acid.

Ferrous sulphate (green vitriol) reacts upon the cyanide with formation of ferrous cyanide, a yellowish-red flocculent precipitate:

$$FeSo_4 + 2\,KCy = FeCy_2 + K_2SO_4.$$

This, however, is under ordinary circumstances slowly converted into potassium ferrocyanide by the excess of cyanide present.

$$FeCy_2 + 4\,KCy = K_4FeCy_6.$$

If sufficient acid be present, the ferrocyanide reacts upon an additional quantity of the ferrous salt, ultimately giving rise to a blue precipitate or coloration (Prussian blue).

$$3\,K_4FeCy_6 + 6\,FeSO_4 + 3O = Fe_2O_3 + 6\,K_2SO_4 + Fe_7Cy_{18}.$$

The appearance of a blue coloration on the surface of the tailings, or in the solution, is a sure indication that acid iron salts are present, and that an enormous waste of cyanide has taken place.

Ferric salts, when present unmixed with any ferrous compounds, decompose cyanide solution with evolution of hydrocyanic acid, and precipitation of ferric hydrate.

$$Fe_2(SO_4)_3 + 6\,KCy + 6\,H_2O = Fe_2(OH)_6 + 6\,HCy + 3\,K_2SO_4.$$

This reaction takes place in two stages, the first being the formation of a soluble but very unstable ferric cyanide, giving a dark brown solution:

$$Fe_2(SO_4)_3 + 6\,KCy = Fe_2Cy_6 + 3\,K_2SO_4.$$

This decomposes as follows:

$Fe_2Cy_6 + 6\,H_2O = Fe_2(OH)_6 + 6\,HCy$, giving rise to ferric hydrate, part of which is in a finely divided colloidal condition, and is with difficulty removed by filtration, as it chokes the pores of the filter.

A mixture of ferrous and ferric sulphates, such as is probably always present in partially oxidized pyritic tailings, causes the appearance of a blue color on addition of cyanide, after the free alkali of the commercial product has been neutralized, Prussian blue (ferric ferrocyanide) being produced when the ferric salt is in excess. $18\,KCy + 3\,FeSO_4 + 2\,Fe_2(SO_4)_3 = 9\,K_2SO_4 + Fe_4(FeCy_6)_3$. and Turnbull's blue (ferrous ferricyanide when the ferrous salt is in excess:

$$12\,KCy + 3\,FeSO_4 + Fe_2(SO_4)_3 = 6\,K_2SO_4 + Fe_3(FeCy_6)_2.$$

(To be continued.)

THE AREAL WORK OF THE U. S. GEOLOGICAL SURVEY.*

By W. J. McGee.

When the U. S. Geological Survey began its work some 20 years ago, only a small portion of the public domain was mapped out, so that the first thing to be done was to prepare a topographical map. It was not considered then nor is it considered now, necessary to prepare a detailed map; all that was and is desired is a map giving the main landmarks and the contour lines, surveyed and drawn with just sufficient accuracy for the scale of the map and no more. It was at first decided to use the scale of four miles to the inch throughout most of the domain and employ the scales of two miles and one mile to the inch in more important centers. However, the methods of survey have been so much improved since then, and the cost per mile so much reduced in consequence, that it has been found consistent with economy to abandon the four-mile-to-the-inch scale, and subsequently the two-mile-to-the-inch scale was abandoned also. This adoption of the one-mile-to-the-inch scale was also rendered necessary, as it became evident that the requirements of geologists would not be met satisfactorily by the smaller scales. The total area surveyed topographically to date is 537,000 square miles, distributed over 42 states and territories. Four states, viz., Connecticut, Massachusetts, New Jersey and Rhode Island, together with the District of Columbia, have been completed. Each sheet of the maps is about 15 × 18 in. and the side of the one-mile to-the-inch map represents 15 minutes of latitude. The sheets are engraved on copper and are printed from stone transfers. Each sheet is printed from three plates, giving respectively the hydrography in blue, the altitudes between contour lines in shades of brown, and the topography in black. Altogether 615 sheets are now printed in the different scales out of the 694 sheets surveyed for. No legal provision has yet been made for the public sale of these maps.

No system has ever yet been uniformly adopted among civilized countries for representing the geological structure and characteristics in maps. Most geological authorities at present adopt some arbitrary system of coloring according to their own taste and fancy, so that the art of geological mapping may be said to be only in a experimental stage as yet. The system adopted by the U. S. Geological Survey is novel, and is thought to meet the requirements of engineers, miners, etc., in a better way than any other method yet proposed or tried. The system provides for the separation of rock formations into four classes, viz.: 1. Fossiliferous or fragmental; 2, volcanic; 3, granitoidal and schistoidal, and 4, superficial. These classes of rocks are represented by ground colors and pattern overprints in such a manner that the entire range of available colors may be used for each. The fragmental rocks are represented by the primary colors in orderly arrangement, each color indicating an age-group (Carboniferous, Silurian, etc.). These colors are used as uniform ground tints and overprints in line patterns represent the distinct formations of which the group is made up. The volcanic rocks are represented by angular figures either on a white ground or over a ground tint representing an age-group. The crystalline rocks are similarly represented by hachures disposed either irregularly or in such a manner as to indicate structure. The superficial deposits are represented by round figures in such a manner that they may be mapped in their normal relation, overlying the older rocks, on the sheets showing the underlying formations. The general system provides for the representation of the geology on the topographical maps. The atlas sheets are colored in manuscript by the geologists in the field and the geological symbols are afterward engraved on zinc. In order to make these sheets available for all uses, provision has been made for printing each sheet in portfolio form, supplemented by as many different impressions of the same map as may be required. Thus the portfolio will usually include a topographic sheet without geological symbols; a geological sheet showing only the age-groups and formations; a structure sheet in which sections drawn to scale are printed on a sheet showing the groups and formation boundaries; sometimes a sheet of columnar sections showing the structure in greater detail; in some cases a sheet showing the superficial deposits only; and when the occasion requires, a sheet of mineral resources, showing the location of mines, quarries, coke ovens, smelters and furnaces as well as mineral areas.

These geological surveys consume much time. Moreover, a variety of circumstances have combined to delay the completion of the surveys except in special districts, such as the Lake Superior iron region, the quicksilver and gold regions of California, the phosphate belt of Florida, the Eureka and Virginia City districts in Nevada, and some mining areas in Colorado.

Final geological surveys of greater or less extent have been executed in 32 states and territories. These surveys cover an area of 117,000 square miles, and are in part represented on 100 regular atlas sheets and a large number of special maps.

The cost of the topographical surveys has varied with the scale and other conditions from less than $1 to over $5 per square mile. The average cost of the survey, including drawing, has been $3 per square mile on the one mile to-the-inch scale and the total cost since the first has been about $4 per square mile. The cost of the geological survey has varied between much wider limits. In fairly representative districts the cost has averaged $5 to $6 per square mile. The average cost from the beginning has averaged $8 per square mile, but this cost includes preliminary expenditure on instruments, books, laboratories, etc.

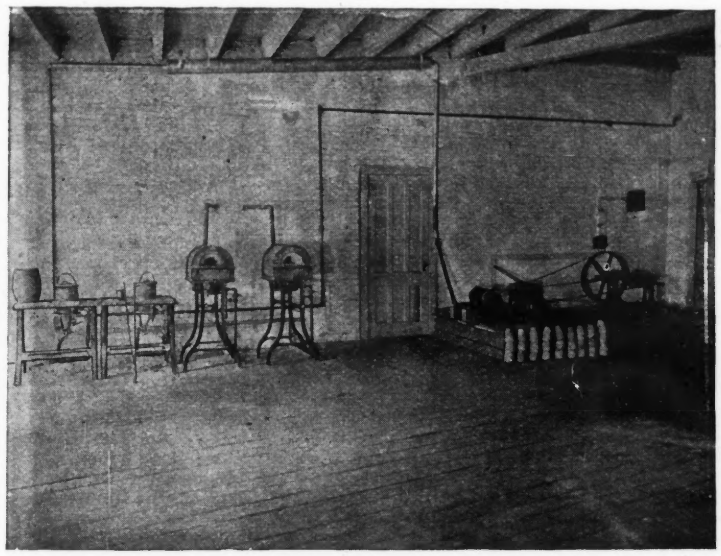
* Abstract of a paper read before the American Institute of Mining Engineers, at the Reading meeting.

A GAS ASSAY PLANT.

Messrs. Ledoux & Company, assayers and metallurgists, of this city, have recently put into operation what we believe to be the first gas assay plant in any commercial laboratory in New York. It was constructed by Messrs. E. P. Richhelm & Co., manufacturers of jewelers' furnaces and fixtures and agents for the American Gas Furnace Company.

As will be seen in the illustration, Messrs. Ledoux & Company's plant consists of two crucible and two muffle furnaces connected with the gas supply by an inch and a half pipe. A one horse power C. & C. motor connected with the Edison current, which is used in the laboratory for copper precipitation and various purposes, supplies the power which furnishes the blast. The motor operates under a pressure of 110 volts, making 1,800 revolutions per minute. By suitable belting and shafting it is connected with a Crowell positive pressure blower, making 300 revolutions per minute. The air from the blower is led through a 2-in. pipe up to a metallic reservoir hung from the ceiling, about 10 ft. long by 8 in. in diameter, thus rendering the blast steady when delivered at the furnaces which it reaches at a pressure of about one pound per square inch. The two muffle furnaces take a muffle 13 in. by 6½ in., accommodating from 6 to 9 scorifiers at one time and from 12 to 15 cupels. The backs of the muffles are connected with a flue by small pipes easily disjointed, which carry off all lead fumes, and which can be readily cleaned out as required.

The points in favor of these gas furnaces are many. Foremost in importance is the ability to regulate the temprature—keeping it uniform from the beginning to end of the operation. The supply of gas and air are under the instant control of the assayer, the temperature being regulated by the opening or closing of a valve. In 20 minuter after igniting the gas, the muffle is hot enough for work, and there is no danger from ashes left over or heated surfaces when the day's work is done. These furnaces do not increase insurance risk, which is a great point. Another advantage is



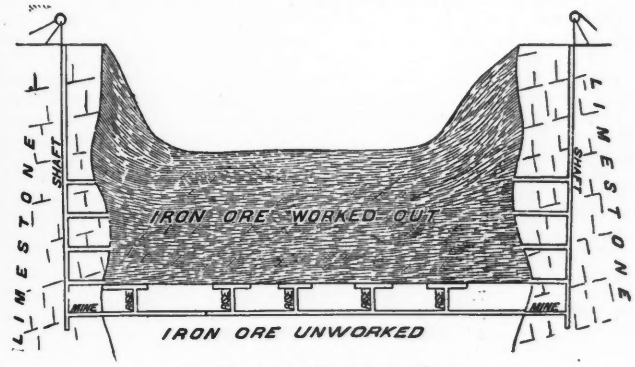
Gas Assay Plant,

the minimum waste heat. The small radiating surfaces, in comparison with a coke furnace, make it possible to operate them without discomfort in the hottest weather. Cleanliness also is another great advantage. The gas burns with a blue flame and there is neither soot, nor smoke, nor dust, nor ashes. What is said of the muffle furnaces applies equally to those for crucible. The question of cost is of course important; the original outlay for motor, blower, furnaces and fittings in Messrs. Ledoux's case was some $750, considerably more than the cost of an equal number of Batterseas, and the operating expenses during a trial of 30 days amounted to some $47.50, of which $10 was the cost of the electricity for the motor and the remainder for 30,000 cubic feet of gas consumed. But as an offset to this, the assayer's time and salary are saved, as in the old process he has to wait an hour or two before the furnaces are ready to operate, and a shut down for an hour or two is a very simple matter, which also is not possible with a coke furnace, the fire of which has to be kept up with its accompanying heat and dirt. If, however, the furnace is stopped and started frequently there is a greater loss from breakage of muffles, which must be taken into consideration. Messrs. Ledoux & Co. inform us that under no circumstances could they be induced to change back again to the old style of furnace for simple assaying. Of course for large meltings and heavy crucible work they still employ melting furnaces at their New Jersey works, and hard fuel.

Chrome Iron in New Zealand.—In a recent report on New Zealand minerals it is stated that chromite, or chromic iron, occurs in the mineral belt of the Nelson district, also at Jackson's Bay, in the Lake Harris range at Milford Sound, where a large block of nephrite was found sprinkled with it, and at Moke Creek, Otago. It is found where olivine rocks occur, and in Nelson as a constituent of the peculiarly hard variety of serpentine known as dunite, sometimes forming more than 50% of the mass. The ore is rich, averaging, it is said, over 55% of chrome oxide. In the Dun Mountain Copper Mining Company's lease a 10-ft. band of the ore occurs. At one time the yield of chrome ore was of considerable importance to the colony, the maximum having been reached in 1862, when 3,843 tons, valued at £24,719, were exported. Almost immediately after that the industry became extinct, and 1866 was the last year of its existence, so far as export was concerned. Altogether 5,666 tons, valued at £37,367, have been exported.

AN ENGLISH HEMATITE MINE.

The iron ore deposit on which are the Park Mines of the Barrow Hematite Steel Company is the largest yet discovered in the Furness hematite district in England. The deposit is 450 yards long and 250 yards broad and is of unknown depth. It occupies an irregular cavity in the limestone of the district and from the surface the mine has the appearance of a disused quarry. Since 1850, the year of its discovery, the ore has been worked continuously and the present output is 600,000 tons per annum. Shafts are sunk in the limestone near the ore deposit at a sufficient distance to prevent injury to the machinery by the workings. At each 10 fathoms in these shafts a level is driven into the ore. As soon as the ore above a particular level has been exhausted drifts are driven in the ore at the level of 10 fathoms deeper and these are connected with each other. At intervals in these drifts raises are driven up to the exhausted level. At the top of these raises workings are opened out in nine feet thickness of the ore, the roof being the rubbish and old wood of the exhausted working above. From the several raises the working out by stoop-and-room goes on in this nine-foot slice, and as soon as it is worked off the next nine feet are worked off in a similar manner, and so on until the particular 10-fathom stage is exhausted. The accompanying sketch, taken from the transactions of the Mining Institute of Scotland, illustrates the method. The ore is sometimes mined in a soft and sandy condition, and at other places it is very hard. The quality varies, and it is often very rich in metallic iron. No mechanical arrangements are used in ventilation, as the air is caused to circulate by natural ventilation between the shafts. Heavy larch is used for timbering. Caps are set on uprights about three feet apart, and the space between is laid with brattice wood, so as to form a close roof. Some of the timber is recovered and used over again, but the greater part is lost in once using.



An English Hemelite Mine.

DIGEST OF RECENT DECISIONS OF THE DEPARTMENT OF THE INTERIOR AFFECTING THE MINING INDUSTRY.

Reported for the Engineering and Mining Journal.

TIMBER LANDS—COAL LAND—MINING CLAIM.

1. The burden of proof is upon a timber land applicant to show that the land applied for is not excepted from such disposition under the provisions of the statute.

2. In determining whether land is subject to entry under the coal land law the means of transportation can not be taken into consideration as affecting the value of the coal which is shown to exist.—(Case involving coal and timber land filed at Oregon City, Oregon)—Smith v. Buckley. —[*Decision Sept.* 14, 1892.]

COAL DECLARATORY STATEMENT—SECOND FILING—PROXY SWEARING.

1. The right to file a second coal declaratory statement cannot be recognized, in the absence of some valid reason for abandoning the first.

2. Final proof will not be accepted on a coal land declaratory statement filed in the interest of others.

3. Swearing to an application, or declaratory statement, by proxy, can find no support in law. (Case involving coal property entry at Seattle. Wash.).—Connor v. Terry.—[*Decision Oct.* 1, 1892.]

MINING CLAIM—SURVEY—CONFLICT.

In case of a mineral entry that is in conflict with a prior pre-emption claim the land embraced within said entry that lies beyond the point where the load or vein intersects said pre-emption claim must be excluded from the mineral survey. *In Re Bi-Metallic Company* holding for cancellation mine entries 2.260 of the *Bassett, Jr., lode claim*, Helena, Montana.—[*Decision October 1st*, 1892.]

MINING CLAIM—PUBLICATION OF NOTICE—REVIEW.

1. The discretion vested in the local register of the General Land office to designate a newspaper within which the notice of a mineral application must be published, is subject to review and control by the General Land Office and the Department of the Interior.

2. A motion for a review will not be granted where no new question has been presented.

3. It is the opinion of the department that the local register shall publish notice of a mineral application in a newspaper which is to be by him designated as being the one published nearest to the claim, not by actual measurement in a direct line between newspaper offices in the same town or city, but in the nearest town or city in which a paper, or papers, of established character and general circulation is or are issued. When several newspapers are published in the same town or city, the register may then designate whichever, in his judgment, will best subserve the public interests and which will give the widest notice to the public that the entrymen are seeking title to a mine.—*Motion for review in the case of Pat Condon et al. v. The Mammoth Mining Co.*, involving mineral entry 1,408 for *the Bradley Lode Claim*, Salt Lake, Utah. (Motion denied.) [*Decision Oct.* 4, 1892.]

THE HOLLAND DIKES.

The question of building dikes to prevent the overflow of rivers has become such an important one in the Central and Southern States, and especially in the Mississippi valley, that engineers in this country must be glad that Mr. William Starling, M. Am. Soc. C. E., has spent some time in Holland, the land of dikes, for the purpose of studying the designs which have been adopted after centuries of experience, and that he has communicated an excellent paper to the proceedings of the American Society of Civil Engineers, describing his experiences in that country.

Almost 60% of all the land in Holland, or, as it should be called, the Netherlands, is protected either from the sea or from the numerous mouths of the Maas and Rhine by means of dikes. Not only is the land very low, but in many instances it is below the mean level of the sea and rivers. This has been caused by the removal of the valueless, peaty topsoil to the depth of several feet in order to expose the more fertile clayey soil below.

The dikes can be divided into three distinct classes: First, those that are used for keeping out the sea; secondly, those at each side of the rivers; and thirdly, those which are built across the country for safety in case a river or sea dike gives away, and which serve the same purpose as watertight bulkheads on board ship. The sea dikes have to be made strong enough to resist the force of storm waves. The two ways of building such a dike would be to make it in the form of either a first class masonry embankment, or in the form of a long sloping earth dike. The former is too expensive and the latter occupies too much foreshore, so that the Dutch have adopted a combination of these two systems. Those exposed to the ocean have a front slope of at least 10 to 1, with the lower portion somewhat steeper; a back slope of 2 to 1, with an inner banquette of 4 to 10 meters, and a crown of 4 meters. The front slope is pitched with stone. All these sea dikes have to be made inordinately strong, so that a study of them is not so interesting as the river dikes.

The circumstances and requirements which govern the construction of a river dike are quite different from those with which we are familiar in connection with reservoir dams. In the latter case the dam is constructed to resist the constant hydrostatic pressure of a body of water. The head of the water is invariably high, and the dam has to be built very solid, and on a rock foundation in order to insure permanence. In Holland, on the other hand, the dike is only called into use occasionally and not for a long time at once. The head against it is comparatively low. There is no rock at any practicable depth on which to build a solid dike. The employment of masonry to any extent would be far too expensive, on account of the great length of the dikes required; and by reason of the comparative scarcity of pure clay, a puddled wall is out of the question. The usual method, therefore, is to construct the dike of layers of clayey earth, carefully dumped down, with a broad base, directly on the surface of the soil, and to resort to various devices to prevent and intercept leakage or seepage-water, and to prevent the dike from being carried away bodily.

There are two kinds of soil met with. Sandy and peaty soil are dangerous to build on direct, as they transmit water without diminishing its head. In such a case the flood water would leak in great quantities under the dike, and very likely the dike would be carried away bodily and destroyed. The other kind of soil, that of the fibrous or honeycombed type, such as vegetable mold and clayey earth, while absorbing water freely, tends to reduce its head, and affords a strong frictional resistance to its flow. Thus, it is practicable to build a dike on such a soil provided certain precautions are taken. Deposits of peat are usually not more than a few feet thick, and can easily be cleared away. If sandy soils are at or near the surface, several feet of clayey soil must be added before the dike proper is commenced, and it should extend inland to a considerable distance in order to act as a hydrostatic balance to the external water whose head is transmitted underneath the dike through the sand. When the sandy stratum is directly underneath, or at some distance below, it is customary to balance the hydrostatic pressure of the water by banquettes on the land side of the dike, and sometimes on the outer side as well. Both slopes of the dike, and to some distance on the land side, are carefully sodded with grass so as to hold the dike together compactly. In many cases it is not possible to use clayey soil throughout the dike, so it is customary to put a thickness of first rate clay on the outer slope, and to use inferior material throughout the rest of the dike. The crown of the dike should be one meter above the highest recorded water mark, in order to allow for high waves. The crown may be from ½ a meter to 8 meters broad, and it is well to make it fairly broad, so that additional height may be added, or that it may be used as a roadway in time of flood. The back slope is usually 2 to 1, and the front slope varies from 2 to 1 where no great waves or current are likely to 10 to 1 where the dike is in an exposed position. It is highly necessary that the direction of the dike should not change abruptly, as such an angle forms a basin in which the wind has full play to raise waves. The dike should run parallel with the direction of the current whenever possible, but it should avoid exposure to winds upstream. It is usual to make the upper part of the dike with a more gradual slope than the lower part, as the upper part is exposed to the shocks of waves and ice, and the lower part cannot be protected by sod, as it is more constantly under water, and the sharper angle makes a stone facing less expensive.

Several methods are adopted for protecting the dikes from the scour of the currents. Those on the sea and on the great rivers are protected by "hoofden," which are spur dikes built of clay and lined with stone, with piles driven through them. They extend out in a long slope to seaward, and when they are meant for river protection they should go out as far as the deepest part of the stream. The river bank can also be protected by spurs made of fascines or zinkstukken ballasted by stiff clay and stones. Another way is to build rows of piles parallel to the dike, and to fill in the space with brush, broken brick and heavy blocks of stone.

In addition to all these protective dikes, sea dikes, river dikes, and bulkhead dikes, there is another class of work to which the dike system is applied. In many of the few districts parcels of ground have been reclaimed by building levees all around it to protect it from the water of the fens. These pieces of land are called polders, and they are all drained, artificially, generally by windmills. When the surface of the polders, consisting of peat, has been cut away, the polders are called droogmakeryen. There are sea polders as well as fen polders, where the reclamation of land from the Zuyder Zee is carried on. In fact, the Dutch are desirous of reclaiming the whole of the Zee in this way.

Mr. Starling's paper occupies over 100 pages of the Transactions of the Society of Civil Engineers, so that it is obvious that very indifferent justice can be done to it in these columns. All who are interested in the subject of river dikes in this country should read the paper in full, as it contains much useful information.

THE VANCOUVER COAL FIELDS.

Although coal was found on Vancouver Island as early as 1831, it was not until 1851 that an attempt was made to mine it by the Hudson Bay Company. Operations were commenced by them at Fort Rupert, near the northern end of the island, but owing to the irregularity of the seams these workings were abandoned one year later. At the same time, however, coal was discovered at what is now the city of Nanaimo, and the company transferred its work to that point.

At present, says United States Consul Myers, of Victoria, in a consular report for September, there are four collieries in operation on the island. Of these, the Nanaimo, Wellington and East Wellington mine in what is known as the Nanaimo district, while the Union Company mines in the Comax district, which is estimated to have 300 square miles. The veins, as a rule, are horizontal, and are from 2½ to 11 ft. thick. The coal is semi-bituminous of Cretaceous age.

The Nanaimo Colliery was first owned by the Hudson Bay Co., who sold it in 1862 to the New Vancouver Coal and Land Co.. Owing to faults in the strata, and other causes, the operations of this company were not profitable, the output between 1862 and 1883 varying from 20,000 to 90,000 tons per annum. In 1884 this company was reorganized with the result that mining was conducted on a more extensive and economical scale. At present the company has five mines, four of which have been in operation since 1884. Shafts Nos. 1, 3, 4, and 5 are all on the same bed, although the quality of coal differs. No. 1 produces a gas coal, which, it is said, will yield 11,000 cu. ft. of gas to the ton. Nos. 4 and 5 furnish coal adapted to steaming purposes. No. 2 (the Northfield,) produces a coal somewhat harder than the others.

The beds dip to the east at angle of 5°. Shaft No. 1 is down 620 ft. through a hard conglomerate rock; the drifts extend under the bay, a distance of 3,000 yards. A shaft 670 ft. deep has been sunk on Protection Island to connect with these workings. The beds of this mine average 7½ ft. in thickness. The Northfield mine has two shafts and a third will soon be added.

No. 3 is about worked out. Nos. 4 and 5, known as the Southfield, are the greatest producers in the district. They are worked by a slope down 800 yds., and a shaft 508 ft. deep. The beds average from 6 to 10 ft. in thickness.

The present daily production of the mines is as follows: No. 1, 600 tons; Northfield, 500 tons; 300 tons at No. 3, and the Southfield, 800 tons.

Wellington Colliery.—This mine was discovered by the late Hon. Robert Dunsmuir in 1869. It was first opened up by a slope which was worked out in a few years. At present there are four shafts from 310 to 375 ft. deep. The beds are 2½ to 10 ft. thick, and the coal is harder than that at Nanaimo. The pillar-and-stall and long-wall system of mining are used in these mines. The output of the colliery averages 1,450 tons per day. Shaft No. 4 produces 550 tons, the seam being 7 ft. thick. Shaft No. 5 produces 450 tons per day, and shaft No. 6, 450 tons per day. A fourth shaft is being sunk between Departure Bay and Wellington.

East Wellington Colliery.—This mine is the property of the East Wellington Coal Company of San Francisco. The veins are from two to five feet thick. There are two shafts in operation, each about 200 ft. deep. The output averages 110 tons per day.

Union Colliery.—This mine belongs partly to the Dunsmuir estate and partly to Leland Stanford, C. P. Huntington and Charles Crocker, of California. The total output, which averages 700 tons per day, is contracted for by the Southern Pacific Railway Company. The mine is worked by slopes and tunnels, shafts being impracticable. Slope No. 4 is in 450 yds., the incline at the entrance being 1 in 7. The seam is 5 to 8 ft. thick, and the coal produced is excellent for coking. The Jeffrey electric coal cutter is in use at this slope. Slope No. 1 is down 700 ft. on a 4-ft. seam. No. 1 tunnel and No. 3 slope are of recent construction.

The development of these collieries since 1874 is shown in the following table:

Year.	Output. Tons.	Year.	Output. Tons.	Year.	Output. Tons.	Year.	Output. Tons.	Year.	Output. Tons.	Year.	Output. Tons.
1874...	81,000	1877	..154.000	1880	..268,000	1883...	213,000	1886..	326,636	1889..	579,830
1875...	110,000	1878...	171,000	1881...	228,000	1884...	394,070	1887	413,360	1890..	678,110
1876...	139,000	1879...	241,000	1882...	282,000	1885...	365,000	1888	.489,300	1891..	1,029,097

The output of the different collieries for the years 1888-91 was as follows:

Collieries.	1888.	1889.	1890.	1891.
Nanaimo	258,817	223,870	389,505	527,457
Wellington	198,392	273,383	174,496	345,182
East Wellington	30,092	51,372	44,602	41.666
Union	2,000	31,204	69,537	114,792
Total	489,301	579.830	678,140	1,029,097

These collieries furnish employment to nearly 3,200 miners, of whom 103 are boys and 510 Chinese and Japanese. The wages paid vary from $2.50 to $3.50 for white miners, $1 to $2 for boys, and $1 to $1.50 for Chinese and Japanese.

In the Nanaimo, Wellington and East Wellington collieries white men are employed as miners, and the Chinese, together with whites, do the work above ground. At the Union Colliery both Chinese and Japanese are to some extent employed both as miners and above ground. Eight hours constitute a day's work in all the mines.

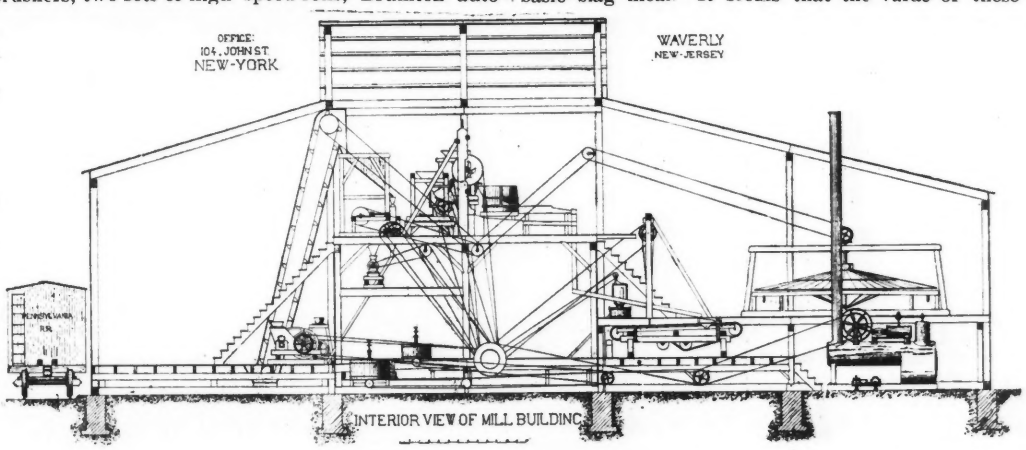
After many years of agitation the provincial parliament in 1890 passed an act prohibiting Chinese labor in the mines, but in 1891 the act was re-

pealed. The following are the principal points of the provincial act regulating coal mines:

Each mine is under the supervision of a certified manager, who gets his authority after an examination from the minister of mines. Inspectors are also appointed by the minister of mines. Their duty is to examine into the state of the mines from time to time. Certified managers make reports to the inspectors. No person, either male or female, under 12 years of age is allowed to work in the mines or above ground. Boys between 12 and 14 are allowed to work, by option of the minister of mines, in mines where the seams are thin, but must not work more than six hours each day. No boy under 18 years old is allowed to operate any engine, windlass, or gin, but a boy over 12 may drive any animal operating the same. Wages are paid by the weight of the coal, deducting rocks and débris. Single shafts are prohibited. Mines must have at least two shafts or outlets separated by not less than 10 ft. of natural strata. Not less than 100 cu. ft. of pure air per minute must be supplied for each person and animal employed in the mine. Each mine is required to be divided into districts of 70 men each, and each district must have a separate current of air. Mines are to be inspected as to ventilation once a day. Mines having had inflammable gas within 12 months are to be inspected at least once a day, and all miners are to be promptly withdrawn in case of danger. The regulations as to safety lamps and lights and the use of explosives are very strict. Each mine is to have special rules, which, under its peculiar state and circumstances, appear best calculated to prevent accident. Old shafts or shafts not in use are to be fenced.

AN ORE TESTING AND SAMPLING PLANT.

Messrs. Ricketts and Banks, of this city, have established a plant at Waverly, N. J., on the line of the Pennsylvania R. R., for handling and sampling ores and metallurgies products as well as deciding in what manner an ore should be metallurgically treated. The sampling machinery consists of two ore crushers, two sets of high speed rolls, Brumton automatic sampler, Sturtevant mill Jeffrey elevators, sizing screens and sample grinders as well as a power drill for sampling bars of bullion, etc.



AN ORE SAMPLING AND TESTING PLANT.

In the testing works there are ore crushers, rolls, a Sturtevant mill, stamp mill, Huntington mill, Challenge feeders, automatic pulp and tailing samplers, amalgamated plates inside and outside of the battery, pans and settlers, Hartz jigs and *spitz-kasten*, slime tubes, Frue vanner and setting tanks. In the dry milling department there is a Bruckner revolving furnace with dust chambers, a reverberatory furnace, barrel chlorinator, generator and tanks, and a full set of tanks for leaching by hyposulphite, cyanide and other processes.

In the smelting department is a Fraser & Chalmers round water jacket furnace 24 ins. in diameter with a height of 8 ft. with a No. 3 Root blower supplying the blast. The assay and analytical laboratory is fully equipped for quick and accurate work, and there is an experimental laboratory attached, devoted to special investigations and researches. The accompanying illustration is a section, showing the interior view of the mill building.

MINING INDUSTRY OF NOVA SCOTIA IN 1891.

According to the official report of the Department of Mines the mineral output of this province for the years 1890 and 1891 was as follows:

	1890.	1891.
Gold, ounces	24,358	24,131
Iron ore, tons	55,191	57,311
Manganese ore, tons	266	41
Coal, tons	1,984,001	2,044,784
Coke made, tons	36,738	34,148
Gypsum, tons	116,003	161,934
Molding sand, tons	170	230
Antimony ore, ton	26	10
Copper ore, ton	1,000	900
Lime stone, tons	35,000	18,000
Grindstones, value	$8,385	$19,800

The output of gold during 1891 shows a falling off of 227 oz. from that of 1890. The ore crushed was 36,543 tons, being the yield of 34 mines. Since 1860 the province has yielded 530,000 oz. of gold. The amount of iron ore mined and smelted shows a small increase over the preceding year. The Londonderry Iron Company rebuilt one of its furnaces, and two new kilns for roasting spothic ores have been added to its plant.

The New Glasgow Iron and Coal Company is building coke ovens of the Coppee pattern of a capacity of 6 tons each.

New iron mining operations have been started at Forbrook which promise well, and a railway has been built from the mines to Wilmot. Over 7,000 tons were produced in 1891.

Long Distance Telephone Between New York and Chicago.—The formal opening of the long distance telephone line between New York and Chicago took place on the 18th inst. The Mayors of the two cities exchanged greetings and many prominent people were present. The line runs from this city to Easton, Penn.; to Harrisburg, Penn.; to Altoona, Penn.; to Pittsburg, Penn.; to Youngstown, O.; to Cuyahoga Falls, O.; to Maumee, O.; to South Bend, Ind., and to Chicago. It has been in process of construction three months, and is made up of 50,000 large and heavy poles, on which are strung two lines of No. 8 copper wire. There are about 50 poles to the mile. The wire used for city telephones is usually No. 12 copper. By the adoption of the much heavier wire and the consequent acquirement of greater conductivity the circuit between here and Chicago is operated by three cells of battery, which is all that is required for ordinary local circuits.

A New Tuyere.—A new form of blast furnace tuyere has been invented by Mr. William Butlin, of Wellingborough, England. Instead of the air passage being entirely conical, the cone shape ceases at a few inches from the end and for the remaining distance the passage is cylindrical. The blast issuing from such a mouth is said to hold together and not to spray out in all directions. Consequently it is claimed that the blast penetrates further into the center of the charge, instead of creeping up the walls of the furnace. It is said that at the Irthlingborough Ironworks where the tuyere has been in use for some time, the proportion of foundry iron produced has increased and that the expenditure of fuel has decreased. It is evident, as another advantage, that when the nozzle becomes worn out, the diameter of the aperture is not increased on being repaired. The manufacture of the new tuyere has been taken up by a prominent firm, Hurdswell, Clarke & Co., of Leeds.

Solubility of the Phosphoric Acid of Bone Meal.—According to Mr. H. Otto in the *Chemiker Zeitung*, the consumption of bone meal has greatly declined in the west of Germany in recent years. He ascribes the cause to the cheapness of superphosphate and an increasing demand for basic slag meal. It seems that the value of these different fertilizers has been quite contradictorily stated by different observers, and it is quite probable and the author infers as much, that Mr. P. Wagner's memoirs on this subject have tended to lessen the regard in which bone meal was formerly held, for in these memoirs the phosphoric acid of basic slag is represented to be superior to that of all other manures and bone meal was placed near the bottom. Mr. Otto, in discussing the subject, says that the chief part of the bone meal met with at present in commerce is produced from bones from which the fat has been extracted by benzine. Such meal always contains from 4¼ to 5% nitrogen, and 21 to 23% phosphoric acid ($P_2 O_5$) and 2% of fat. All bone meals containing less than 4% *N.* and 20% $P_2 O_5$, are not purely degelatinized meals, or the entire substance of the bone has not been used, as the solubility of the phosphoric acid of basic slag in Wagner's citrate solution was cited as a proof of its superiority, Mr. Otto makes similar experiments with bone meal and finds that according to the fineness of the meal, from 8.05 to 9.15% of $P_4 O_5$ is soluble in a slightly acidulated solution of ammonium citrate and from it draws the conclusion that its solubility depends upon its freeness from fat.

Quicksilver Statistics.—The receipts of quicksilver at San Francisco, Cal., for September and for the first nine months of the year were as follows

	For September.	Jan. 1 to Sept. 31.
1890, flasks	1,165	9,238
1891	1,113	10,581
1892	1,762	13,978

The exports by sea last month were only 462 flasks, of which 439 went to Mexico, 10 to New Zealand and 13 to British Columbia. The movement by sea for the first nine months of the year has been as follows:

	Flasks.	Value.
New York	2,900	$124,800
Australia	762	31,047
New Zealand	150	6,227
Central America	42	1,669
Mexico	2,085	82,994
British Columbia	215	8,435
Total	6,154	$255,172
In 1891	3,058	134,516

At least 375 flasks of quicksilver shipped to Australia in May, June and July were brought back to this port by the same steamers that carried it away. Reference to this was made in the ENGINEERING AND MINING JOURNAL October 8th.

PERSONALS.

Prof. John A. Church, mining engineer, of this city, has returned from a professional visit to California.

Mr. W. E. Sharon has been appointed assistant superintendent of the Belcher mine, at Virginia City, Nev.

The Michigan Mining School at Houghton is without an electrical course. It is proposed to ask the State Legislature for an appropriation.

Mr. George F. Kunz, the well-known mineralogist, has been appointed honorary special agent of Mines and Mining of the World's Fair.

Mr. Otto F. Pfordte, mining engineer, of Hoboken, N. J., but recently of Pueblo, Colo., has taken charge of the Hornet mill at Telluride, Colo.

Mr. Robert Sticht, formerly metallurgist of the Boulder Smelter, Montana, has been engaged to superintend the erection of a similar plant at Kokomo, Colo.

Mr. Augustus Bowie, mining and hydraulic engineer of San Francisco, has been in this city recently on his return from Idaho, where he has been on professional business.

Mr. E. P. Wilbur, president of the Lehigh Valley Railroad has been elected a director of the Philadelphia & Reading Railroad Company, vice Mr. Thomas Cochran, retired.

Mr. C. F. Dunham, superintendent of the Mula mine, near Monterey, Mexico, for the Monterey Smelting and Refining Company, is now in this city, where he will remain for several weeks.

Mr. B. F. Thayer, the former mine foreman of the Bi-Metallic Mining Company, is now manager of the Coeur d'Alene Silver Lead Mining Company mines which include the well known Poorman mine.

E. Benjamin Andrews, president of Brown University at Providence, R. I., has been appointed by the President a delegate to the International Monetary Conference in place of Gen. F. A. Walker, declined.

Mr. Tyler Calhoun has been promoted from the position of mining engineer of the Tracy City Division of the Tenn. C. I. & Ry. Company to that of superintendent of this company's coal mines at Whitwell, Tenn.

The Marquis de Bolages, director of the Carmaux mines, France, where a great strike is in progress, has resigned his seat in the French Chamber of Deputies, hoping that his action will facilitate a settlement.

The umbrella left by some member of the American Institute of Mining Engineers at the lunch Friday afternoon, the 14th inst, at the Reading meeting, can be recovered by correspondence with the finder through this office.

Mr. J. J. Ormsbee, mining engineer and superintendent of the Tenn., C. & I Ry. Co.'s coal mines and coke ovens at Whitwell, Tenn., has resigned, to become superintendent of the Sequachee Valley Coal and Coke Company's mines at Pikeville, Tenn.

Hon. A. Brand, M. P., and Mr. F. Muir, of England, are now in Helena, Mont. Mr. Brand is president of the Elkhorn Mining Company, Ltd., and a director of the De Lamar Mining Company. Mr. Muir is president or chairman of the latter company.

Mr. John A. Potter has resigned his position as general superintendent of the Homestead mills and has been appointed chief mechanical engineer. Mr. Charles H. Schwab, general superintendent of the Edgar Thomson plant, will succeed Mr. Potter at Homestead.

Mr. Meeks, president of the Colorado Coal and Iron Company; Mr. Curtis, secretary and treasurer of the same company, and Mr. Osgood, president of the Colorado Fuel Company, left New York on Monday, October 17th, for Denver, Colo., for the purpose of attending a meeting of the stockholders of both companies, the meeting being called to ratify the plan of consolidation recently given in our columns. The meeting was held October 20th.

Prof. Charles E. Munro, chemist at the torpedo station at Newport, R. I., since 1886, has resigned his Government position to accept a chair at the Columbian University in Washington. Since he has been at the torpedo station he has greatly improved the process of the manufacture of gun cotton, and he recently produced an excellent grade of smokeless powder, which is said to be superior to the foreign make. Prof. Munro will assume his new duties on November 1st.

OBITUARY.

W. G. Maurer died at Girardville, Pa., last week, aged 52 years. At one time he was one of the owners of the East and West Bear Ridge collieries.

O. J. Cook, superintendent of the Monterey mine near Silver City, Utah, while ascending the shaft was instantly killed on Monday, October 10th, by the unfastening of the bucket. He fell a distance of 175 ft.; striking on his head.

Thomas Bell, one of the oldest pioneers and mining men of California, died in San Francisco on the 16th inst., through the results of a fall in his residence. Mr. Bell was a pioneer in California, having arrived in 1850. He was one of the incorporators of the Bank of California, and at the time of his death was one of its directors. He virtually controlled for the Rothschilds a quicksilver output of the state, being personally largely interested in the New Idria, New Almaden, Great Western and other California quicksilver mines. He was a large owner in the famous North Broomfield gravel mine, in the Trinmfo mine of Lower California, the Father De Smet, Caledonia and other mines of the Black Hills group, as well as a number of properties in Tuscarora and Comstock districts in Nevada. He leaves a fortune valued at $4,000,000, which will go to his wife and six children.

James I. Bennett, a prominent iron manufacturer of Pittsburg, died at Allegheny City, October 11th, at the age of 70. Mr. Bennett for many years was very prominently identified with the iron industry in western Pennsylvania. He was born in Crawford County about 70 years ago and at an early age came to Pittsburg, taking a position with the firm of J. Painter & Sons. Later he entered the firm of Reese, Graff & Woods. When Reese, Graff & Woods went out of business, Mr. Bennett, John Graff and a Mr. Marshall became the owners of their plant under the firm name of Graff, Bennett & Marshall. He at once became the recognized head of the firm, and when the name of the firm was changed to Graff, Bennett & Co., the firm was considered one of the largest and most solid iron manufacturing establishments in the country. The firm at one time owned the Clinton mill on the South Side, two blast furnaces at Leetonia, O., a structural iron works at Thirty-second street, Pittsburg, and was largely interested in the Isabella furnaces and the Kittanning rolling mill. Mr. Bennett was at one time president of the Pittsburg & Lake Erie Railroad Company and a director of the People's National Bank.

SOCIETIES.

The National Academy of Sciences will meet at Baltimore, October 31st. The sessions of the Academy will be held in the physical laboratory of the Johns Hopkins University, public sessions for the reading of scientific papers being held on Tuesday, Wednesday and Thursday of that week.

At the stated meeting of the Franklin Institute, Philadelphia, September 21st, Edwin J. Houston, president of the electrical section, described his improved methods of fixing and delineating the magnetic field, and gave illustrations of the projection of views.

F. Lynwood Garrison described some of the recent trials of Harveyized nickel-steel armor plate made by the Bethlehem Iron Company. These plates were tried at the private proving grounds of the company. They stood the firing test (five shots from an eight-inch gun, powder charge 81¾ lbs., Holtzer projectile of 250 lbs. weight) very well indeed. The plate was 8 × 6 ft. × 10½ in., and weighed 18,600 lbs. It received "a total energy of impact of 25,040 foot-pounds, fully fifty per cent. greater than the plates were subjected to in the previous trials, and exhibited, nevertheless, much less injury than the plates in the former tests." These tests are given in his report in the journal of the Institute.

Louis E. Levy described his new process for the producing photo-intaglio engravings, and submitted specimens which were greatly admired. The paper will probably be published. W. N. Jennings showed some remarkable photographs of lightning, taken by himself from a rapidly moving train in North Dakota at midnight August 8th, 1892.

The secretary, Wm. H. Wahl, described with lantern projections the Buckman automatic tin-plate machine as used at the works of the American Tin-plate Machine & Mfg. Company, Philadelphia. The secretary announced that plans were being made for distributing to every member of the Institute a copy of the journal without increase of cost in annual dues.

In the Chemical Section, meeting of September 20th, Dr. Arno Terne gave an historical account of the Association of Agricultural Chemists, and discussed the merits of the methods used in the analysis of fertilizers.

In the Electrical Section Dr. W. H. Wahl had a paper on the plant and process used by the Tacony Metal and Iron Company, Philadelphia, for electro-plating the large ornamental iron work for the City Hall, with an aluminum alloy.

The Institute awarded the Scott Legacy premium and legacy to Baldwin for his boiler-tube cleaner, and the Longstreth medal to the Mackay & Rossendale Company.

INDUSTRAL NOTES.

The Beckett Foundry and Machine Company have removed from their old office at 121 Liberty street to the Central Building, No. 143 Liberty street, New York.

Rollers and finishers from the iron mills of Western Pennsylvania and Ohio met at Youngstown, O., on the 10th inst., to organize a Finishers' Union. This is regarded as a splitting off from the Amalgamated Association.

The B. F. Sturtevant Co., Boston, Mass., are shipping one of their large steam fans to a mining company for ventilating. This company manufacture ventilating fans of all sizes, either with or without engines to drive them.

Owing to increasing competition, the business of the important copper and smelter works of Pascoe & Grenfell, at Swansea, England, established a century ago, will be wound up. The closing of the works will throw 700 persons out of employment.

The Berlin Iron Bridge Company, of East Berlin, Conn., have received from the Jackson & Woodin Mfg. Company, of Berwick, Pa., the contract for the new car wheel foundry. The building will be from the designs of the Berlin company, made entirely of iron.

The new 350-ton concentrator building at the Bunker Hill & Sullivan Mining Company, Wardner, Idaho, will be heated with the Sturtevant blower system. This is the second order for the system, it having been used for two years in their 450-ton concentrator with the best success.

A fire occurred in Jersey City, N. J., on the 16th inst. which damaged a number of establishments. The losses are estimated at $125,000, divided as follows: Vulcan Iron Works, $40,000; Theodore Smith & Brothers, $25,000; Wallis Iron Works, $25,000; David Birdsall, $25,000, and Wm. H. Heyniger, $10,000.

The largest number of Homestead strikers returned to work on the 17th inst. at the company's terms who have yet applied in the same length of time. These men were all given employment. It is reported further that the steel workers who live up Munhall Hollow and at Gehringtown are organizing to return to work in a body.

The plate department of Light's rolling mill, Lebanon, Pa., which has been idle for the past 17 months, started up recently, giving employment to a number of additional men. The department closed down in April, 1891, owing to a costly break of the engine. The strike followed in June, 1891, and the plate department has remained idle ever since.

The Bristol Rolling Mill Company at Bristol, Pa., has been compelled to make an assignment. The property was first levied on October 15th, on executions issued by the Quaker City National Bank, for an indebtedness of $21,000. Later in the day the assignment was made. Liabilities are about $100,000. The cause of the trouble is said to be mismanagement.

A charter was issued on the 18th inst. by the Secretary of State of Pennsylvania to the Elk & Lycoming Gas Fuel Company, to pipe natural gas from Horton, Fox, Bensinger, Jones, Highland, and Spring Creek townships, Elk County, Pennsylvania, to Renovo, Lock Haven, and Williamsport, Pa. The capital is $50,000, and the principal office in Ridgway, Elk County.

The first crusher to be set up at the hard ore mines in the Lake Superior region has just been put in operation at the mines of the Minnesota Iron Company, at Tower, Minn. It is a Blake sectional rock crusher weighing 23 tons, and its jaws are large enough to take in a lump of ore 20 in. by 24 in. The makers are the Lake Shore Iron Works, at Marquette, Mich.

The well known firm of Henry R. Worthington has opened a new branch office at No. 1,762 Larimer street, Denver, Colo., where it will carry a full line of pumps, water meters and repair parts. Complete arrangements have also been made for handling the increasing business in that section, which has necessitated the establishment of a branch office at Denver.

The Lidgerwood Manufacturing Company, 96 Liberty street, New York, will soon publish for gratuitious distribution, a 40-page pamphlet, illustrating, with a number of finely executed half tone plates, the Lidgerwood rapid unloader, a new device used for discharging dirt, ballast, gravel sand, or other material from flat cars. The rapid unloader has been used for the past year with great success.

The Haugh-Kurtz Steel Company, of Anderson, Ind., manufacturer of open-hearth steel ingots, billets, castings, etc., is making a number of large castings for the United States government. It recently cast the largest crank shaft ever made, it is said, in the United States, and also large cylinder heads. It is now on with work weighing 3 tons and upward respectively. A large crane and a 42-in. planer have recently been installed.

In the case of the Central Trust Company, of New York, against the United States Rolling

Stock Company, Judge Bruce, of the Federal Court, decreed that unless the defendant company pays the interest and principal on the bonds and indebtedness, amounting to $1,150,000, within 30 days, that the company's car works plant at Anniston, Ala., and Decatur, shall be sold.

The Pennsylvania Railroad Company will soon begin, at its works at Altoona, Pa., the construction of the largest freight car ever built by any American or European company. The car will have 32 wheels and a carrying capacity of 124 tons. It will be used for transporting the cannon which is now being cast at the Krupp Works, Essen, Prussia. This gun is expected to arrive in this country early in the ensuing year, for exhibition at the World's Fair, together with several other pieces of heavy ordnance and an immense armor-plate manufactured by the Krupp Company.

A certificate of organization was filed at Trenton, N. J., yesterday, incorporating the Mechanical Rubber Company with a capital of $15,000,000. The incorporators are Henry W. Cannon, president of the Chase National Bank of this city; James B. Ford, John F. Townsend, president of the Knickerbocker Trust Company of this city; William Barhour, of the Barbour Brothers Company, Paterson and this city, and D. H. King, Jr., builder, of this city. This company is organized to carry on the business of making, purchasing, and selling india-rubber goods and apparatus for mechanical and all other purposes, and all goods of which rubber is a component part, also the various materials entering into the manufacture of such goods.

It is the intention of the Pennsylvania Railroad Company to place a system of interlocking signals all along the road. At present the company is erecting a power-house in the vicinity of Holmesburg Junction, near Philadelphia, to furnish power to the new system. Already the automatic system of signaling is used between Pittsburg and Wall station. It is operated by the wheels of the locomotive. Two wires are placed along each rail. These are connected with signals, the wheels of the locomotive completing the circuit. The new system not only gives warning of approaching trains, but tells their exact location within two blocks ahead and behind it.

The Walburn-Swenson Manufactory Company, successors to the Fort Scott Foundry and Machine Works Company of Fort Scott, Kansas, having decided to remove to the East where they will manufacture several patented specialties for use in those states and for export, are offering for sale their foundry and machine shops at Fort Scott. This is one of the most perfectly appointed plants in the West. Constructed in 1886 from the most approved plans, the buildings are of large capacity, well lighted and arranged for traveling cranes. They are situated on 13 acres of high ground, and are connected by switches with all the railroads entering the city. Their advertisement will be found in another column.

In regard to the expiration of the Bell Telephone patents the "Commercial Bulletin" says: Bell's patents issued in 1876, giving him the sole right to use an undulatory current of electricity for the transmission of speech, expires March 7th, 1893. Bell's "magnetic" patent issued in 1877, giving him the sole right to use a certain method for transmitting speech, expires in 1894. This covers the ordinary telephone. Thus after March 7th, 1893, the broad claim is gone; and after January 30th, 1894 the magnets patent will be open to the public. But the Bell company holds the Berliner patent which may run for thirteen years more on the microphone and there is no known way to conduct an exchange business commercially without the use of this instrument. But when the magnetic patent expires in 1894, it will be practical to establish private or direct lines of telephones, because the hand transmitter can be used as a transmitter to talk through as well as to hear with.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

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

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

No charge will be made for these services.

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

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

Goods Wanted at Home.

2,806. Stave and hoop making machinery. Virginia.

2,807. A small planer and matcher suitable for light custom work; also a saw gummer. Virginia.

2,808. Filter press and steam pumps for oil refining. North Carolina.

2,809. 500 ft. 25 or 30 lbs. second-hand T rails. Virginia.

2,810. A 36-in. swing by 16 ft. bed engine lathe, a 24-in. back gear drill press, and a heavy universal milling machine. Mississippi.

2,811. A second-hand lathe, sufficient to handle 15 ft. shafting, a 30-in. by 30-in. by 5 ft. planer, and a power drill press. Mississippi.

2,812. Machinery for a 5 to 10 ton ice plant. Virginia.

2,813. Machinery for manufacturing 100 to 200 bales cotton a year into cotton rope. South Carolina.

2,814. A quantity of 2½ in. and 4 in. second-hand wrought iron pipe in good condition. Alahama.

2,815. Detailed estimate and full particulars for an inexpensive pumping plant for irrigating purposes. Power to be supplied by a gasoline, naphtha or kerosene engine. Capacity of pump to be 1 cu. ft. per second, with lift of 60 ft.. Washington.

2,816. A wood splitter. Virginia.

GENERAL MINING NEWS.

The Associated Press reports the consummation of a big deal in coal lands, by which the extreme activity of the Chesapeake & Ohio Railway in building branches up Gauley River and Loup Creek, in West Virginia, and paralleling its tracks for 18 miles on the opposite side of New River, is said to be explained. The people in the arrangement are the McKell Coal Company, of Chillicothe, O., 30,000 acres; H. C. Lowe, of Brooklyn,, 40,000 acres; a syndicate with Drexel, Morgan & Company as agents, 40,000 acres. These lands are in a body on New, Loup, and Gauley rivers, and 20 mines are being opened now on the McKell land. Twenty each, it is said, will be opened immediately on the Lowe and Drexel-Morgan lands, and be in operation by January 1st. It is claimed that the New River coal can be mined and coked cheaper than anywhere else in the United States, and that it contains 5% less ash than the Connellsville coal. In addition to the foregoing purchases, M. E. Ingalls, C. R. Green and others have bought 60,000 acres of gas coal, all in a body, in Raleigh County, W. Va., and the Chesapeake & Ohio R. R. is building into it.

ALABAMA.

Fort Payne Coal and Iron Company—An adjourned meeting of the stockholders was held October 19th in New York City to take into consideration some means looking to a reorganization of the company and to hear a report from its receiver, W. K. Sheldon, of Fort Payne, Ala. More than two hundred holders of stock and bonds were present. Judge Turner, of Birmingham, Ala., presided. Mr. Sheldon made his report, but previous to its presentation Judge Turner gave a long statement as to the prospects of affairs at Fort Payne. He suggested that the stockholders appoint a committee of business men to take into consideration such plans as might be brought out at this meeting to reorganize the company and save the property.

Walter I. Ballou, of Woonsocket, R. I., asked the chair what class of stockholders would be liable to creditors for unpaid stock—those who took stock from the company or those who got it as transferees? The chair said in his opinion those who purchased from the company.

Receiver Sheldon reported that the debts to the company, less the assets, would be more than $400,000. He suggested the appointment of a committee to devise ways and means of reorganization. On motion of Hon Henry B. Pierce, a committee, consisting of R.P. Kingman, of Brockton; C.A. Williams of Providence; J. R. Clark, of Boston; E. J. Fletcher, of Brockton, and W. L. Lowell of Newton, was appointed to formulate some plan of reorganization.

ALASKA.

(From our Special Correspondent.)

THE NORTH AMERICAN TRANSPORTATION & TRADING COMPANY.—This is the company formed this year, and which has even already revolutionized the mining industry in the interior of the country. A steamer was taken up in sections to St. Michaels, on Norton Sound, 80 miles from the mouth of the Yukon, and there put together. She was then loaded with provisions, the framework for a trading post at Upper Ramparts, 2,000 miles from the river mouth, and a complete hydraulic plant. Many of the miners have decided to winter up country this season, and they will now be able to get provisions, etc., and at a reasonable rate. The placer fields on the Upper Yukon are rich, but as flour sold for from $15 to $18 per sack and miners had to abandon diggings that did not pan out at least $10 per day, for with the short season and these high rates they would have nothing left at the end of the season. Now this is changed. Flour will be sold for $3 per sack, and everything else in proportion. As soon as navigation opens next year the company propose sending up the river $150,000 worth of provisions and machinery, when some important results will be obtained.

ARIZONA.

Pima County.

Austerlitz, Oro Blanco.—This mine has 40 men at work taking out ore. Work on the grade for the mill is going on, and the timbers are arriving. The mill has not yet been received.

Yuma County.

Bonanza, Harqua Hala.—The new machinery for the 20-stamp mill to be erected is being received at the mines. The ore, it is said, continues in abundance, is of as good grade as ever, and the present mill of Messrs. Huhhard & Bowers is turning out gold regularly.

CALIFORNIA.

(From our Special Correspondent.)

The assessments falling delinquent this month will be apportioned as follows: Mono County, $12,500; Nevada County, $8,000; Placer County, $7,000; Yuba County, $1,000; total, $28,500.

Kern County.

(From our Special Correspondent.)

The Maltby Mine, Woody.—The mine was abandoned some time ago on account of water. Recently a shaft was sunk to tap the mine below the old workings. The pay chute has been found to be about 60 ft, long, with the vein ranging from 5 to 25 in. wide and carrying an ore seam about 5 in. thick and milling over $300 per ton in gold. The ground from tunnel to the old works having been stoped out the last run of 38 tons yielded 221 oz. of gold, valued at $2.762 or an average of over $73 per ton. In this run the ore was not assorted.

Mariposa County.

(From our Special Correspondent.)

Buena Vista Mine, Crocker's Station.—A ledge of rock, between eight and nine inches wide, has been struck at a depth of 15 feet. The ledge is widening as the shaft is sunk, and as the ore ranges from $62 in gold and $1.67 in silver and upward, and is improving with depth, the outlook is encouraging.

Mono County.

(From our Special Correspondent.)

Bulwer Consolidated Mining Company, Bodie.—A dividend of 5 cents per share has been declared. Mill work being carried on in the mine is not of any exceptional interest save in the east crosscut, 200 level, which is being extended in the hope of uncovering an ore body of importance.

Bodie Consolidated Mining Company, Bodie.—A small seam of ore in the north drift, above the 300 level, is very good and shows signs of widening out.

Placer County.

(From our Special Correspondent.)

Some rich strikes have been made in the county this week. Out of the twenty-nine tons of rock crushed in the Ophir district on Wednesday $5,000 was realized, and there is plenty more of the same kind of rock in sight. Early in the week, too, a nugget valued at $2,600 was taken out from a claim in the Butcher Ranch District.

COLORADO.

Dolores County.

Enterprise Mining Company.—The Rico "News," in commenting upon the differences between this company and the Rico-Aspen Consolidated Mining Company, says: "It has been an open secret that from the moment that the Rico-Aspen came into the field they met with the antagonism of the Enterprise, and a few months ago the Rico-Aspen people claimed that the Enterprise company was mining on the Rico-Aspen ground. Manager Browne of the Rico-Aspen succeeded in getting President Moffat to insist upon a joint survey. The survey proved the Enterprise to be mining nearly a 100 ft. on the patented Vestal ground. Injunction suits were immediately started, and since that time surveys are said to show that the Enterprise has extracted and on several claims is extracting ore, the following properties of the Rico Aspen having been entered: The Contention, Vestal (contact and vertical), Aspen, Selenide and Old Discovery."

Gunnison County.

Augusta.—This mine has been bonded and leased to C. McGahren, of Aspen, and M. J. Kelly, of Virginia City, Nev.; according to the "Elk Mountain Pilot," the consideration was $200,000. The bond is to run 32 months. Work will be commenced at once, and will be confined this winter to the old workings, but next summer a tunnel will be started at the base of the mountain to cut the vein at a great depth. The bond price is considered very high.

Hinsdale County.

According to the Lake City "Phonograph" the shipments of ore from Lake City during September were 68 cars or 714 tons. Of this about 500 tons were concentrates, chiefly from the Ute & Ulay Mines, Limited. In the other shipments were several carloads of Carson Camp ores that make returns of $5,000 to the carload, besides the shipment by express that gave returns at the rate of $10,000 per ton.

San Miguel County.

Smuggler-Union Mining and Milling Company.—The Bleichert tramway from the Rio Grand Southern Railroad track in Pandora Park to the mouth of the tunnel now being driven by the Smuggler-Union has been completed and is in successful operation. The length of the line between the termini is 5,400 ft., with an elevation of 1,870 ft. The upper or stationary cable is 1⅛ in. in diameter, and weighs 280,000 lbs. The traction cable, ⅞ in. diameter, weighs 120,000. Fourteen supports were required, the highest being 120 ft. and the lowest 15 ft. above the surface, placed at intervals of 75 ft. to 1,100 ft.

The last is said to be the greatest span covered by a wire tramway in this county.

The tramway is equipped with 36 buckets, placed at intervals of about 300 ft., each having a capacity of 5 cu. ft. moving at an average speed of 250 ft. per minute. Ten tons of ore per hour are delivered at the bins of the lower terminal, and this amount can be increased when necessary by placing the buckets closer together and using more of them. The ore bins at the lower terminal are situated on both sides of a side track of the Rio Grande Southern, and have a capacity of 250 tons; at the upper terminal, a capacity of 100 tons. Hand labor is now employed for loading the buckets, but will be supplanted by an automatic feeder, supplied direct from the ore bins. The Trenton Iron Company constructed the line.

IDAHO.

Ada County.

A special correspondent of the Spokane "Review," writing from Boise, says: "The opal fields on Snake River, near Caldwell, are causing considerable excitement. New York gem exporters have written that specimens forwarded to them are high grade fire and milky opals. No systematic mode of mining the gems has yet been followed. The fire opals are found embedded at intervals in a well defined ledge of dark blue granulated rock. The ledge is apparently about 50 ft. wide and has been traced from Squaw Creek to a point in the hills opposite Hot Springs, a distance of 37 miles. Milk opals are found in yellow granulated sandstone. Several fine opals have been found embedded in these ledges, but have been destroyed in attempting to remove them.

Boise County.

Boise City, Oct. 18 (*by telegraph*).—The bonds in the case of Pettibone, Murphy, Devine and St. Clair, the Cœur d'Alene rioters, convicted of conspiracy in the United States Court at Cœur d'Alene City, were not approved by the clerk of the court here. Joseph Pinkham, United States marshal, accompanied by Deputies John Richards and Harvey Harris, left yesterday with the prisoners for the United States penitentiary at Detroit.

Homestake.—There are 200 tons of ore on the dump which it is said will run $90 per ton; $10,000 was paid for the mine six months ago. The 10-stamp mill is nearly ready for crushing. The owners of the Homestake Placer gulch secured $1,745 from five tons of last season's bed rock cleanings.

Muddy.—The tunnel being run to cut the vein at the 600 ft. level is now in 1,065 ft. and is going ahead at the rate of 50 ft. per week.

Seven Devils District.—This district is exciting considerable attention owing to the occurrence of native gold in the copper ore; $1.200 in gold has been obtained in two weeks. Drake's shaft is now down 100 ft. and the gold occurs as fine wires throughout the copper. It is reported that Boston people who are interested in the district will put up a smelter in the spring. The Queen Bess, one of the claims in this district, has been bonded for $5,000.

Wolverine.—The shaft has reached a depth of 600 ft. and the miners are cutting out a station. As soon as that work is completed another level will be opened up for stoping. The 20-stamp silver mill is still running.

Idaho County.

(From our Special Correspondent.)

Elk City Placers.—Mr. L. H. Patchen has just returned from Elk City, where he with others own some 80 acres of placer ground. He was accompanied by a placer expert, who tested the gravel by panning and secured an average of 8 cts. to the pan, or $2 to the cubic yard. Mr. Patchen thinks that $1 would be a fair average judging from the several tests made from different parts of the ground. The gold is coarse. The gravel will average about 5 ft. to bed rock. He contemplates putting in a 1,200 ft. flume next season.

Red River Placer Company, Elk City.—This company is composed mostly of Chicago capitalists who own ground six miles up the gulch adjoining Mr. Patchen's claim. They propose working their claim by means of a steam dredge. A boat 40 × 70 ft. will be built on which will be placed the dredging machinery and along the side will be run sluices in which the dredge will empty its load, the sluices carrying the debris to the rear of the boat. The machinery has to be packed in on mules at a cost of 2 cts. to 7 cts. per pound. The company own some 900 acres of ground about two-thirds of which they propose to work as above. Grayville, the terminus of the wagon road, is about 50 miles from Elk City. There are a number of gold ledges in this section but they have never been worked on account of the diffienlty experienced in getting machinery to reduce the ores. The county commissioners are now surveying a road from Grayville into this camp and will construct the road early next year.

Kootenai County.

Enterprise.—This mine has been sold by W. T. Smith for $8.000 to a Montreal syndicate. The claim is an extension of the Copper lode.

Owyhee County.

De Lamar Mining Company.—During the month of September 2,490 tons were crushed. Total expenses, $36,000; total receipts were $76,140, as follows: Bullion, $62,020; ore shipped, $13,600 and miscellaneous, $520. The net profit is estimated at $40,140.

INDIANA.

Jay County.

The Crissel well, which is the heart of the new Portland oil field, and whose drilling has been anxiously awaited, has proved to be a big gasser. It is the largest that has been struck in that section and is perfectly dry, without a sign of salt water or oil.

KANSAS.

Cherokee County.

During the week ending October 15th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 2,662,270; rough ore, pounds sold, 1,866 500; zinc ore, pounds sold, 884,930; lead ore, pounds sold, 181,300. Sales aggregated a total value of $13,279.

KENTUCKY.

Bell County.

It is announced that the Louisville & Nashville Railroad Company will build an extension of the Cumberland Valley division in Southeastern Kentucky from a point near Pineville up Clear Creek, a distance of 12 miles, passing through the Log Mountain coal and timber district. The new road will reach the thickest vein of high grade cannel coal yet discovered in the Pine Mountain, and several superior veins of coking coal. The Log Mountain district comprises over 30,000 acres, all owned by Messrs. F. A. Hull, of Danbury, Conn,; Thomas Cairns H. P. Wyman and Dwight Cutler, of Grand Haven, Mich. These gentlemen have organized the Log Mountain Coal, Coke and Lumber Company, with $2,000,000 capital, and the main office has been located at Pineville. This company will lease coal lands for mining on royalty, and a very active development is expected.

MICHIGAN.

Colby.—At this mine on the 18th inst., when the day shift was going down, the cage, containing 19 men, fell over 700 ft. to the bottom. One man was instantly killed, and all had legs broken. Many were injured internally. It is thought that four will die. They were using a "patent" cage, provided with "safety catches," which refused to work.

Gold.

The Ishpeming "Iron Ore" says of the gold belt: "The mill at the Fire Centres company's property has not yet been started up. The Beaver shafts are being sunk and show no change from the condition heretofore mentioned. Both are favorable. At the Crescent the rock shows freely of gold, and the company now has a stoping face in the granite bluff of about 30 ft. in height. The company is now searching for the continuation of the vein on the opposite side of the hill. The sinking of a shaft at this place will commence soon.

Ropes Mining Company.—The skip incline will be completed to the 15th level in a short time, when driving to cut the vein will be begun. The winze from the 14th level is said to be in ore of excellent quality. Good ground is also showing up on the 5th level. Superintendent Weatherstone is of the opinion that good bodies not heretofore encountered will be met with in the upper levels, and the prospects for an improvement in the lower ones are good, says "Iron Ore."

Copper.

Calumet & Hecla Mining Company.—It is reported that the ore from No. 1 shaft is running rich. Work in the Whiting shaft is progressing satisfactorily. The shaft is 2,700 ft. deep and work was begun October 13th, in starting the fourth crosscut to No. 4 shaft, Calumet. These drifts become shorter as the shaft is sunk deeper. The present one will be only about 750 ft. long, while the first one at the 34 level was over 1,500 ft.

Carp Lake Mine.—According to the Michigan "Copper Journal" an option on this property has been given to a Cleveland syndicate. This mine is one of the oldest in the Lake country.

Centennial Mining Company.—A correspondent of the Boston News Bureau sends the following telegam concerning the strike recently reported: "Just returned from Centennial. The strike was what is termed in miners' parlance a counterfeit vein, a bunch of rich ground overlying the veiu. They have gone through it. No certainty of reaching Calumet rich streak witbin limits."

National Mining Company.—This company has struck a mass of copper in the 14th level, amounting to three tons or more. The largest piece will clean up about 1,800 lbs. of mineral. The company has now 10 tons of copper about ready for shipment.

Quincey Mining Company.—According to the monthly report the construction work at No. 6 shaft—the old Pewable mine—is nearing completion, and hoisting from one skip road with the new engine has been commenced. This shaft was sunk 124 ft. during the month. The new rock house is nearly completed, and will be ready for use as soon as the rock and steam hammers are in place.

Quincy Mining Company.—The skip fell 1,500 feet on October 17th, doing considerable damage.

The fourth head of the mill will start working Saturday, October 22nd.

Tamarack, Jr., Mining Co.—Concerning the work at this mine the Calumet and Red Jacket "News" says that although No. 2 shaft is not being sunk at present that drifting both north and south has been proceeding steadily each drift being now in a distance of about 150 ft., the ground gone through showing a little copper. The No. 1 shaft is down to the 4th level. The drift here going south is not showing up as well as the one above, but it carries some copper. The south drift at the 3d level is in about 500 ft., the lode here is some 12 ft. wide, from four to six ft. being rich rock, and the drift has supplied some good stoping ground. A winze is being sunk from the 4th level, and it is now down some 70 ft., the bottom being in good ground.

Wendigo Copper Mining Company.—The exploring work of this company on Isle Royale has at last definitely ceased, says the Michigan "Copper Journal."

Iron—Marquette Range.

Cambria Iron Company.—Orders have lately been received from headquarters to ship several cargoes of this ore. Up to the present time but little has gone forward. The Cambria was delayed considerably this summer by reason of a fire which destroyed the engine house and plant of machinery contained therein. Repairs have now been made and the mine is again running as formerly.

Iron Cliffs Mining Company.—This company has given an option on a "40" section of its property to Mr. J. Jacka. Machinery has been taken to the ground and explorations will commence at once.

Lake Angeline.—The water has been brought down to a narrow strip that is fast becoming narrower. The task of removal will soon be finished, and then there will be increased activity in this ore basin. The scow has been moved to its last station and a suction pipe of some 200 feet in length has been run from the pump. This will be extended to the deepest point in the lake and will take all the water without further shifting of the pump. The bottom of the lake shows much mud, but this soon dries when exposed to the sun.

New York Iron Co.—Ore shipments have ceased for the season and the men are now employed mining. During the time shipments were made no ore was mined.

South.—This property is located a short discance to the south of the Swanzey mine and is in the hands of Mr. Edward Lobb and others. Last week the new owners struck a vein of hematite and at present writing the entire bottom of the shaft is in ore, says "Iron Ore." Specimens containing a high percentage of iron are taken out, and there are prospects that the near future will show something valuable.

Iron—Menominee Range.

A dearth of labor seems to exist througbout the entire district, says the "Diamond Drill." The Shafer management complains of a shortage of men as previously noted, the Claire was recently compelled to abandon the night shift; the Dunn could use more men to an advantage; the Mansfield carries a "standing" advertisement for men at "good wages and steady employment," and so it exists at nearly every operating mine in the district. The McIntosh Brothers are unable to secure men for $2 per day for work on the Milwaukee & Northern extension. To sum it up, in the Crystal Falls district wages are good and men are scarce.

Claire Iron Company.—Work at this mine has been somewhat impeded by a scarcity of miners. During this week, however, enough miners were secured to man the night shift. The output is maintaining a big average and this mine will figure largely in the total output of the district in 1892, 65,000 tons being already to its credit. On October 12th a hole from the open pit into the old Youngstown workings was blown through. This was caused by a deficiency in the maps of the Youngstown workings. No damage was done save that which will follow by a drainage of water into the Youngstown during the winter.

Curry Iron Company.—According the Norway "Current" a pinching of the hanging wall on the ore body at the seventh level of No. 1 Curry, is causing considerable anxiety. The ore in the level above extended several hundred feet further and was found in the first room from the shaft at the lower level, but in continuing the work rock was encountered, which the management has so far found itself unable to go through or around. However, the trouble is not considered of a permanent nature. The crosscut which is being driven from the south vein to the north one, and the 4th level of the Curry, is now in 115 ft.

Dunn Iron Company.—About a year ago it was feared that the north lense at the Dunn would "pinch out," as the ore body at the seventh level was very narrow as compared with the levels above, but since then developments in the underground workings have dispersed all such fear, and to-day at the ninth level the ore body at No. 2 shaft has widened out to such an extent as to warrant and insure further sinking, says the "Diamond Drill." The quality of the ore has also improved. At No. 1 shaft considerable ore has been found under the new stripping in places where it was not expected. Shipments have been maintained at the usual rate and will to-day aggregate about 122,000 tons.

Lumberman's Mining Company.—At the reorganization of this company Mr. S. M. Stephenson was elected president and Mr. P. L. Kimberly, vice-prisideut.

MINNESOTA.

Vermilion Range.

The ground known as the "Lone Dick" quarter has been leased to Alfred Merritt and R. H. Palmer at an advanced royalty of $10,000 and subsequent royalty of 30 cents a ton for the term of 30 years.

Iron—Vermillion Range.

Duluth Ore Company.—It is said that this company has purchased the interests of John R. Berringer in the west forty of the Biwabik and that a deal is just being completed to turn the property over to P. L. Kimberly to be operated in connection with the Biwabik.

MONTANA.

Deer Lodge County.

A movement is on foot in Granite looking toward the organization of a new mining company, says the Philipsburg "Mail." The ground which it is proposed to take in lies east of the Granite mines and consists of the Eureka, Broadhead, Rocket, Neversweat, East and West Lexington and the Monte Christo claims, which are owned by Charles F. Donyes and others. The object of the projectors is to run a tunnel on the Eureka, which will serve to develop all the other claims. This tunnel will be commenced this fall and continued about 600 ft.

Algonquin Mill.—This mill has been shut down for repairs and a general clean-up. This mill has turned out nine bars of fine silver bullion in three weeks.

Bell.—This mine has been leased, 30% being paid on ore shipped. The upset price is $25,000. The shaft is now down 50 ft., at which depth it cut shipping carbonate ore. As far as explored there are three streaks, all of which is good ore.

Bi-Metallic Extension Mining Co.—The *Phillipsburg Mail* says of this property: "There has been but little to report from this property since the north vein was reached, but development work has continued steadily. It is an acknowledged fact that the company made a mistake in crossing to the vein at the depth it did, but of course this could not be told until the vein was reached and its condition disclosed at that depth, and it was then seen that the cross cut was not deep enough. It was plainly evident that it had tapped the vein on the apex, and while little ore of value was found in it the indications are so favorable for a large body lying deeper that the company has since been sinking in the vein.

There is no indication that the operations will be discontinued on the property. It is true, of course, that it has but a small working fund left, but it will manage in some way to keep the work under way.

Jefferson County.

A special dispatch to the Helena "Mining Journal" says: "Wickes and vicinity are very quiet on account of the low price of silver. Mine owners can not make it pay. The Corbin concentrator is running full time, working ore for the Alta mine and is concentrating 200 tons daily. The new mill at Corbin is running again, experimenting on low grade ores. The Frisco concentrator up in Cataract district, about eight miles from Wickes, has been running six weeks and is doing good work; doing mostly custom work for the Black Bear, Eva May and Series. Nearly all the prospectors are busy doing assessment work for the year 1892.

Elkhorn Mining Company, Limited.—This company reports for the month of September ore crushed 1,125 tons; ore sold, 405 tons; total expense, $23,992; total receipts, $56,502; estimated profit, $32,510. Work on the 1,450 south drift has commenced.

Lewis and Clarke County.

American Development and Mining Company.—According to the latest report the new Golden shaft is down 35 ft. A whim is to be purchased and two shifts of men employed. The Roadside tunnel cut the vein at a depth of 80 ft., disclosing a fine body of ore. Two new tunnels have been started on the Sunlight claim, and are being driven with three shifts of men. At a distance of 190 ft. one of these tunnels will undercut a point on the surface where the vein is shown to be 20 ft. in width, all milling ore. Several new buildings are being erected.

Belmont Mining Company.—The last two clean-ups at this mine have been reported to have been very satisfactory, and the company to be making money. Ten stamps are at work with plates and vanners, and ten with pans and settlers. The old tramway from the mine to the mill is being repaired.

Whitlatch Union & McIntyre Gold Mining Company.—The clean-up from the test run on the ore from this property was very satisfactory. The mill has worked well, the tailings showing only a small percentage of loss.

Meagher County.

Galt.—This vein runs parallel with the Queen of the Hills, nearly 400 ft. apart. The tunnel is in 600 ft. An upraise for air is being made. This mine shows 4 ft. of ore in the tunnel that assays, it is claimed, from $250 to $300 per ton.

Queen of the Hills Mining Company.—In the tunnel which is in about 1,000 ft. there is a vein from 2 to 9 ft. wide. At the mouth of this tunnel, and about 300 ft. from the creek, a new shaft is going down. At 150 ft. a cross cut was run in about 2 ft. when an ore body, samples from which assaying from $300 to $500 per ton, was found.

Misscula County.

Tom Cowan and others have discovered and are working a 20-ft. vein of free milling cold ore near Sternsville. The average ore from three cuts is said to run $20 per ton.

Park County.

Castle Noble Mining Company.—The Helena "Mining Journal" reports a strike on this property. The lead is said to be 4 ft. wide and to contain 100 oz. silver, $5 in gold and 30% lead per ton.

Crevice Mining and Milling Company.—The mining camp of Crevice is, according to local papers, attracting considerable attention. The above company has just completed laying a mile of pipe to supply its mill with water. Twenty stamps are in place and work will commence shortly.

Golden Star Mining Company.—This property is developed by a tunnel in 75 ft., all in ore, the lead running from 15 to 36 in. in width, and the ore assaying from $10 to $137 per ton. The company has recently completed and is now running a 3-stamp mill, which has been running since its completion with satisfactory results.

Independent Mining Company.—The mill which was only recently started has been forced to stop on account of an accident to the boiler, and it is not likely to resume work under a month. The company will keep its force to work, however, having leased the mill of the Hidden Treasure Mining Company for 30 days. Up to the time of the accident, the company was crushing 18 tons per day, which, it is said, averaged $50 per ton.

Silver Bow County.

County Assessor M. L. Holland, as required by law, has prepared a table of statistics for the past year. It is a very interesting compendium of figures. The yield of copper and silver bullion for the year is valued at $17,955,007. There are 11 mills and smelters in operation in the county. The daily wages of employés in the mining and smelting industries are as follows: Blacksmiths and carpenters, $4.50; engineers, $4; feeders and firemen, $3.50; laborers, $3; masons, $6; miners, $3 50; ore sorters, pumpmen, roasters and smelters, $3.50; smelter helpers, $3.25

Anaconda Mining Company.—The "Daily Metal Market" says: "We can state upon undisputed authority that this mine will close down on November 10th and remain closed for three months. The action will be taken for the purpose of cleaning up ores and flue dust now on hand, and making certain alterations and repairs. It has no bearing on the copper market. The production for 12 months will not be decreased, because upon again starting the production will be materially increased, bringing it up to the average of past years." This action, said Mr. Haggin in an interview, was due to the desire of making repairs, as the mines had been running for some time. It is more probable that the curtailment of production according to the terms of the copper "combine" has made this step necessary.

NEVADA.

(From our Special Correspondent.)

The assessments falling delinquent during the current month are apportioned as follows: Elko County, $20,000; Storey County, $35,500; total, $55,500.

Elko County,

The following are the latest official weekly reports of the superintendents of the Tuscarora mines:

Commonwealth Mining Co—Second level, in line stope there is a streak of fair-grade ore. In drift from No. 3 to line stope nothing of value was encountered. Third level—West drift from No. 1 raise discontinued; vein matter in face of drift gives low assays. A west drift has been started in the vein, giving low assays. South drift or raise has been started in the vein, exposing some low-grade ore. Hoisted one car fair-grade ore, assays $190 per ton, and five cars second class, assay value $23 per ton.

Navajo Mining Company.—The stopes above the 350 ft. level are looking very well and continue to yield a good quality of ore.

Nevada Queen Mining Co.—East stope—the ore seam is narrow and produces but little ore. Hoisted two cars first-class ore, assay value $225 per ton, and five cars second class, assay $26 per ton.

Nevada Queen Mining Company.—At the annual meeting of this company 77,000 shares were represented and the following officers were elected: P. C. Hyman, president; Thomas Cole, vice-president, and Thomas Bell, G. W. Grayson and William Bowers, directors. R. R. Grayson was re-elected secretary and F. F. Coffin superintendent. The financial statement showed an overdraft of about $9,000, but has an offset ore valued at between $13,000 and $15,000.

North Belle Isle Mining Company.—No. 1 north drift, south 300 ft. level, extended 4 ft., the vein being of good width with considerable high-grade ore scattered through it. North intermediate from No. 1 raise. No. 3 drift south 400, extended 6 ft., the vein getting better, the ore solid and good grade.

Esmeralda County.

Mount Diablo Mining Company.—A shipment of 5,851 oz. of fine silver has been received at the company's office in San Francisco. The mine is yielding the usual quantity and quality of ore and the company's mill at Soda Springs is doing good work.

(From our Special Correspondent.)

Gold Recovery Company, Salt Lake City.—The gold tailings bought by this company are being worked by the cyanide process with satisfactory results. There are about 8,000 tons of tailings, averaging $8.40 to the ton. Of these 30 tons are being worked each day.

Storey County—Comstock Lode.

Belcher Mining Company.—The latest official weekly letter says: "The north drift on the 400 ft. level has been advanced to a total distance of 52 ft. north of the vertical raise. The face is in soft porphyry, with seams of low grade quartz through it. An east crosscut has been started from the north lateral drift on 300-ft. level, at a point about opposite the joint shaft. It is out 20 ft. and the face is in a vein formation composed of porphyry and streaks of low grade quartz."

Crown Point Mining Company.—The latest official weekly letter says: "We continue to follow the ore north and south on the 160-ft. level in the south stope. In the west stope the pay ore on the fifth floor maintains its width and quality, as reported last week. On the surface the dumps are full of ore, which will be reduced as soon as milling facilities can be obtained through an increase in the flow of water in the Carson River."

Consolidated California & Virginia Mining Company.—This company, says the San Francisco "Report," contrary to expectations, lost money last month, and ran behind its expenses to the extent of $3,000. The company now has an indebtedness in Virginia and in San Francisco aggregating about $11,500. Among last month's expenses were the following items: Salaries and wages, $28,000; mine supplies, $10,813; reduction of ores, $25,500, and royalty to Comstock Tunnel Company, $2,428.04.

Potosi Mining Company.—The official returns of the working of Potosi ore at the Nevada mill for September show that the quantity of ore crushed during that month was 1,800 tons; gross proceeds in bullion, $36,261.03; cost of reducing, $10,800; net proceeds in bullion, $25,461.03; assay value per ton, $22.64; gross average per ton, $20.14; net average per ton, $14.14. The mill worked the ore up to 89% of its assay value.

Savage Mining Company.—The official report of the ore worked and bullion produced at the Nevada mill for account of the Savage Mine during the month of September is as follows: Bullion produced—gold, $10,128.59; silver, $26,396.96; total, $36,525.55. Discount on bullion, $9,790.95; net amount cash received, $26,734.60; tons of ore milled, 2,250; average battery assay, $22.23; average car sample assay, $26.62; percentage obtained, 73% of the average battery assay.

(From our Special Correspondent.

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

Mine.	Tons hoisted.	Car sample assay.	Tons milled.	Av. battery assay.	Bullion product, week.	Bullion shipped.
		$		$	$	$
Con. Cal. & Va.....	988	27.82	980	23.03	.....	30,693.25
Overman.....	67	17.82	158	.....	.....	.....
Occidental.....	170	.....	[1]80	17.20	.....	.....
Potosi.....	429	24.75	365	24.08	.....	[2]701½ lbs.
Savage.....	[3]493	22.35	525	20.76	7,629.30	.....
Silver Hill.....	139	29.25	189	24.56	.....	[4]79½ lbs.

[1] Mill idle 3 days for repairs. [2 4] Crude Bullion. [3] Cars.

It will be noted that, with one exception, the weekly product is not given, and in other instances also the law is otherwise evaded.

Hale & Norcross Mining Company.—On Wednesday Judge Heobard rendered a decision denying the defendant's motion for a new trial in the case of M. W. Fox against the Hale & Norcross Mining Company et al. In affirming the original opinion and decision the court gave a crumb of comfort to the directors of the Hale & Norcross Company, with one notable exception, when it alluded to the able argument of counsel on behalf of C. S. Wheeler, one of the defendant directors. "It appeals," said the court "strongly to my sympathy in support of the motion so far as Mr. Wheeler individually is concerned as I now reconsider the case in the light o every fact, circumstance and result, I wish that my judgment might allow me to grant to him, as well as to all of the defendant directors, save one, who are similarly situated, the advantage of a new trial. I wish that upon the first consideration on this case and consistent with my ideas of law and duty, I could have absolved these defendants from all responsibility.

"Two of the defendent directors I know personally; all of them I know by reputation, and beyond their relations to and connection with the grave charges made and proved in this case, I know nothing to their disadvantage. With the single exception of H. M. Levy, I believe they would have scorned a division of the spoils of the conspiracy in any amount whatever."

This is pretty hard on "chief looter" Levy, and, perhaps, a shade too light on the other directors. For instance, and quite apart from any known facts which might be proven against him, Major Eagan has come into court and pleaded what is known here as the "baby act."

It is almost certain he will not get the redress he craves. The law specifically states how a defendant wrongfully accused and implicated, innocently and through no fault of his own, with guilty parties, may obtain a hearing and be justified before the law. Major Eagan has most carefully abstained from taking that course and to the ordinary mind that alone ought to place him outside the pale of public sympathy. The fact is that Major Eagan, as well as others of the directors, dare not take the proper legal means to secure redress, for they would be met with evidence that, in all probability, would sink them deeper in the mire than at present. That any one of them would "scorn a division of the spoils of the conspiracy" is open to doubt. Not very long ago Alvinza Haywood transferred a valuable business building on Montgomery street, close to Sacramento, to Major Eagan, and the "value and consideration" is commonly reported to have been the love and affection the ancient mill-owner bore the Hale & Norcross director. Certain it is that very shortly afterward, when troubles loomed ahead of the mining company, Major Eagan deeded over the property to his wife. The fair inference is that he then intended to face judicial proceedings with the old saying in his mind that "one can't get blood out of a stone," nor recover money for damages from a penniless soldier.

Of course such knowledge was not in the possession of Judge Hebbard and his decision is based on the evidence adduced during the trial. Despite, however, the sympathy expressed for the defendant directors the Court aptly defines the situation in saying: "I am thoroughly satisfied that these same directors, by their gross carelessness and negligence, by the violation of the trust reposed in them by the stockholders of the company and by the violation of the duty imposed upon them by law, allowed and permitted the other defendants to misappropriate the property of the corporation."

White Pine County.

Keywest.—Another strike has been made in this mine, now under bond and lease to A. D. Young. The strike consists of a 6 ft. body of ore at a vertical depth of 40 ft., and, it is said, the deposit increases in width. The ore assays 78% lead and 74 oz. silver.

NEW MEXICO.

Grant County.

According to the Silver City correspondent of the New York "Sun," some work is being done in the placers at Pinos Altos, but there is not enough water to carry on extensive operations, and it is not probable that there will be much water in the mountain streams before spring, as rain seldom falls here in the fall or early part of the winter.

The Silver City correspondent of the New York "Sun" writes as follows: "Another strike has been made at Cook's Peak. A large body of lead carbonate has been discovered in the Inez mine. Although there have been several rich strikes in the mines in this district within the past few months, none, it is said, is as rich as this. The ore in the camp averages about 58% lead and 8 oz. in silver per ton. The ore in the Inez runs about the same in lead as the other mines in the camp, but it is richer in silver. No camp in New Mexico has ever made such progress as Cook's Peak. Previous to this strike in the Inez the camp was producing about 100 tons of ore a day, and the value of the output was greater than that of any other camp in the territory. The owners of the Inez expect to ship three car loads of ore a day, and the output of other mines in the camp will be increased, so that the total output of the mines there will not be less than 200 tons a day by the close of this month. Ore mined on the west side of the peak is freighted to Crawford station on the Atchison, Topeka & Santa Fe, between Silver City and Deming, and ore mined on the other side of the mountain is shipped from Florida station. A narrow gauge railroad to the mines is projected, and construction will be commenced in a short time. The survey for the mine has already been made.

Brockman.—The first clean-up at the Brockman mill at Lone Mountain was made two weeks ago, and resulted in 240 lbs. of silver bullion. The owner of the mill has under consideration a plan to increase the capacity of the mill, in order to treat custom ore from the Lone Mountain and Central districts.

Carlisle.—Ten stamps in the Carlisle mill are running on ore from the Laura mine. Only the low grade ore is treated in the mill. The best ore is shipped to the smelter. The Alabama mine at Carlisle has a 4-ft. body of ore which averages $80 per ton in gold and silver. The ore is shipped as it is mined, without sorting. There is more doing in Carlisle now than at any time since the Carlisle Gold Company (limited) suspended operations about three years ago. This company was mining and treating over a 100 tons of ore a day.

Ohio.—Messrs. Bell & Stephens, of Pinos Altos, shipped 181 ozs. of gold bullion recently from the Ohio mine. Their mill has been running steadily on ore from this mine, but ore has been accumulating, until there are about 400 tons of ore on hand, and the working force in the mine has been reduced, in order to keep the production down to the capacity of the mill, which is about 20 tons a day. A tunnel is being driven from the bottom of the main shaft on the Ohio to the surface on the side of the mountain. Work was commenced at both ends of the tunnel, and it is expected that the connection will be made within a week. The mine will be drained th ough the tunnel, and the expense of mining the ore will be less than it has been heretofore.

OHIO.

Jefferson County.

Royal Gas Company.—This company has raised rates three times since entering the market, the advance aggregating 50 per cent. Now it has shut off the fuel supply from the Jefferson Iron Works, while the Acme Glass Works, because of a shortage of gas in day time, will be compelled to run only at night. The company gives notice it is expecting some new gas wells in shortly, and insists that it will have an abundant supply in winter.

Seneca County.

The Sloman gas well near Tiffin was torpedoed recently and developed a flow of 1,800,000 cu. ft. per day with a pressure of 475 lbs.

OREGON.

According to the Baker "Democrat," A. O. Eckson, chief engineer of the Oregon Pacific Railroad, W. L. Robert, of Corvallis, and L. L. Scott, president of the Portland Loan and Trust Company, have patented a process for saving the flour gold of Snake River. The principle of the process consists of forcing gold carrying sand over a silver plate and through three separate mercury baths. The flour gold is thus secured. The mercury baths are charged with some composition that amalgamates the metal. Outside of the labor the Oregon invention can be operated for 10 cents a day, and any of the Snake River bars will yield from $4 to $20 per day to a man when gold is saved. This idea is hardly a new one, and we do not think it will prove a success. It would seem, on the face of it, that by passing the gold through a mercury bath that it would readily amalgamate, but unfortunately such is not always the case. The idea has been tried and found wanting.

The Bedrock "Democrat" has the following concerning the mines of the state: The mill plant of the Robinson Mining Company at Elkhorn Mountain is about completed, and will be started crushing by first of the month. Its capacity will be 25 tons every 24 hours. The Hurdy Gurdy Mining Company is erecting a Tremaine prospecting mill on their property near Rock Creek. The new ten-stamp mill on the White Swan mine is being built. The placer season throughout Baker and Grant counties is about over and the yield has been greater than for many years. The season's run at the Nelson mine is about closed. Good times are reported from Cracker Creek. The Eureka and Excelsior mines are running with a large force. The North Pole Company has a large force of miners employed and the mill-building operations are being pushed rapidly ahead. Upward of 300,000 lbs. of machinery purchased in the East will soon arrive here. The Baker City Foundry and Machine Works is engaged in turning out 13,000 lbs. of shoes and dies for the White Swan mill, besides a large amount of other work for various mill plants throughout the country. It has been about conclusively demonstrated, we are informed, that the White Swan ledge is a continuation of the Virtue mine and is a true fissure.

PENNSYLVANIA.

Coal.

The Tresckow colliery near Hazleton, worked only nine hours per day last week owing to a scarcity of water.

The Jeanesville and Yorktown collieries worked one full day last week and four hours each day for the remainder.

At the No. 1 stripping in Jeanesville the steam shovel is at present cutting through a bed of rock nearly 22 ft. high.

Delaware & Hudson Canal Company.—The workings of this company's colliery No. 3, at Plymouth, caught fire on the 13th inst., and for a time the destruction of the mine was threatened. Prompt and active work for several hours brought the flames under control, but all the timbering at the bottom of the shaft was burned out and the mine will be idle some time in consequence.

Kaska William colliery, near Middleport, one of the largest collieries in that section, has been abandoned, having been worked out. For two years the work of robbing the pillars has been on and is now completed. The mules were hoisted and shipped to the Lehigh Coal and Navigation Company, at Lansford, to be used in the mines in that vicinity. The abandoning of this colliery throws a large number of men and boys out of employment. The company proposes to sink a new slope in the vicinity.

Pennsylvania Railroad Company.—It is asserted upon seemingly reliable authority, says the Scranton "Tribune," that this company is preparing to tap a new field in the anthracite region. The district affected is that of which Ashland is the center. A party of railroad officials recently have been making preliminary surveys over the mountains between William Penn, where a branch is at present being constructed, and Mt. Carmel, where it is proposed to connect with the Northern Central tracks. Other surveys have recently been made at Girardville.

Philadelphia & Reading Coal and Iron Company.—The new slope which is being sunk by this company at the new Elmwood colliery at Mahanoy City, is progressing rapidly. It is the intention of the company to widen out the tender slope and drive it 100 yards or more below the present level.

Oil.—The following items are from the Pittsburg "Times:" The People's Gas Company drilled its well on the Dickson farm, south of Willow Grove into the sand on the 16th inst., and it started to flow at the rate of 30 barrels an hour. The Fitzgibbons & Co. well on the Fisher farm, northeast of McDonald, has been drilled through the fifth and will make a very light well. The Patterson & Sohn well on the Erhmantrout farm, at Undercliff, is in the 30 ft. and showing for a well. Three miles southwest of Sistersville the Victor Oil Company has drilled in a well on the Keener heirs' farm, that is showing for a good producer. The production of the McDonald field on the 16th inst. was estimated at 20,500 barrels. The runs from the Sistersville field were 14,735 barrels.

Washington County.

Manufacturers' Natural Gas Company.—The well of this company, located on the McNary, is finished and reported a good gasser. It has been turned into the company's line. The Jefferson Gas Company is putting down a well in the Canonsburg district near the Spear oil well.

Philadelphia Gas Company.—This company is finishing its new gas pipe line from the Linden Gas Field to the Cook Farm, north of Cannonsburg. It is a little over four miles in length, and will give the company complete facilities for carrying gas from its Canonsburg wells. The work of building it was commenced a month ago. Engineers have been at work for several days on the survey of the natural gas line from the Pleasants gas field to Parkersburg, W. Va. C. C. Davis, of Harrisville, who is in the employ of the West Virginia Company, has begun the work of securing the right of way. The enterprise will be pushed as rapidly as possible.

SOUTH DAKOTA.

Lawrence County.

Deadwood & Delaware Smelting Company.—This company has made the last payment for the Ross-Hannibal Mikado, and Calumet & Carthage mining companies, properties. The total paid was $140,000, according to the Deadwood "Daily Pioneer." The new stack which is to be erected at the smelter will be, it is said, the largest matte stack in the world. The furnace will be 36 ft. in height. It is thought that the new stack will treat over 150 tons of ore daily.

Seabury-Calkins Mining Company.—At a recent meeting it was decided to purchase a diamond drill and prospect with it from the 178 ft. level in the shaft.

Pennington County.

Rapid City Chlorination Works.—The capacity of this plant has been recently increased by the addition of two roasters, and the plant can now treat from 80 to 140 tons per day.

TENNESSEE.

Bledsoe County.

The Sequachee Valley Coal and Coke Company are opening new coal mines at Pikeville, and are to build 100 coke ovens at once. C. P. Perrin, general manager; J. J. Ormsby, superintendent.

UTAH.

Juab Co.

North Eureka.—A body of quartz heavily stained with iron has been encountered in the drift running northeast from the shaft. Development will be continued throughout the winter.

Salt Lake County.

Inland Salt Company.—This company is sinking a 6 in. well 800 ft. on its ground at the lake, and when that depth is reached 4½ in. pipe will be sunk 600 ft. further, at which point it is expected to find natural gas.

Old Dixon.—Large shipments of both first and second class ore are being made. The ore body is 8 ft. wide. According to the Salt Lake "Tribune" large quantities of smelting ore are accumulating. The hoisting work will be in operation by the end of October.

Sensation Group.—The owners of this group are doing some extensive development work, says the Salt Lake "Mining Journal." The new tunnel, being driven to cut the pipe of ore in the upper workings is now in a distance of 225 ft. Ore from this deposit assays as high as 32 per cent. lead, 180 oz. in silver and $2 in gold. The old tunnel is in 360 ft., and in it a 11 ft. body of low grade ore has been opened out, and it is the intention of the owners to build a concentrator in the spring at the mine and treat the ore on the spot.

VIRGINIA.

Botecourt County.

The iron mine of F. E. Sheets at Bessemer has been leased to Mr. Stevenson, who is mining ore. Night and day shifts are employed. The ore is said to be of good quality.

WASHINGTON.

Stevens County.

The Spokane "Review" reports the finding of a vein of rich gold ore along the extension of the Spokane & Northwestern Railway.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

Slocan.

Washington—According to the Spokane "Review," a one-third interest in this mine has been sold by S. K. Green to T. E. Jefferson, for $35,000 cash. At present the property is developed by a 65-ft. tunnel on the vein. It is claimed that the ore runs $150 in silver and 70 per cent. lead.

FRANCE.

A cable dispatch announces that a part of the workings in the St. Bel pyrite mines, in the Department of Rhone, collapsed on the 13th inst. A number of miners were caught under the falling debris and three of them were killed. Several others were badly injured.

MEXICO.

Michoacan.

Considerable activity is reported from Tlalpujahua. The Santa Gertrudis y Anexas Company is still at work sinking its shaft and will soon have it completed to a sufficient depth to commence crosscutting. In the meantime it is taking out some fine ore above water level and will shortly ship another carload, says the "Mexican Financier." A new Cameron stationary pump has just been placed on the tunnel level at the shaft, where it throws the water up to the surface tanks which supply the boilers

The Santa Rosa has been shut down for a time, but will start work again as soon as certain business arrangements have been concluded.

The Concepcion and the Coloradillas group of mines will shortly be sold to a syndicate of English capitalists who, it is said, are prepared to spend all the money necessary to make the property dividend-paying.

The owners of the Nacional mine have resumed work on the shaft. The grading of the new mill is almost finished. The machinery is now en route. Its erection will be superintended by Mr. A. J. Rigby.

A new steam hoist, taking the place of the old mule-power hoist, has just been erected at the La Luz de Borda mine. The company is now better able to cope with the little water in the shaft and to sink more rapidly than formerly. The vein in the shaft averages about 2¼ ft. width of good milling ore and about 6 in. of rich shipping ore. The crosscut being run to tap the Trigueros vein is now nearly finished.

Candelaria & Anexas Mining Company.—In a recent issue of "El Minero Mexcano" Mr. P. Porto gives an extended account of the present condition of this company and its mines. From it we learn that the company was formed in 1873 with a capital of $5,640, and paid between 1874-'80 some 23 dividends aggregating $350,000. The vein of the Candelaria has a dip of 45° and a width of 18 in. It contains gold and silver in equal amount. The company owns 14 mines, which include 41 pertenencias. The Candelaria mine has three shafts, all 200 metres in depth. All the other mines are opened up by shafts, but none so extensively as the Candelaria. About 1,000 miners are employed. The weekly output is from 75 to 90 tons of ore, the greater part of which is exported to the United States, or sold to the Metalurgica Mexicana Company, of San Luis Potosi The ore containing less than 56 oz. per ton is treated at the company's mill.

The monthly expenses amount to $25,000. The average of the ore as shown by the returns to the Consolidated Kansas City Smelting and Refining Company, are, per earga of 300 lbs, as follows:

Ore 1	Silver	22.40	marcs.	Gold	15.46	ounces.
" 2	"	9.35	"	"	4.13	"
" 3	"	5.24	"	"	1.71	"
Ordinary	"	2.95	"	"	0.67	"

There is enough ore in sight to warrant the belief that the present situation will continue for a considerable length of time.

The output during the last four months has been as follows:

Sales to the Metalurgica Mexicana de S. Luis Potosi, $49,210.56. Sales to the Consolidated Kansas City Smelting and Refining Company, $141,934.43. silver remitted to New York, $22,310.00. Silver remitted to New Mexico and Zacatecas, total, $230,966.70.

Sonora.

Pan-American Mining Company.—This company which controls the MacArthur-Forrest process in Mexico has made a contract to treat a dump of 100,000 tons of gold tailings.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo.; Baltimore, Pittsburg Deadwood, S. Dak.; St. Louis, Helena, Mont.; London and Paris, see pages 406 and 407.

NEW YORK, Thursday Evening, Oct. 20.

This has been another "Columbus" week, the Federal Government having decreed a holiday tomorrow. The exchanges have adjourned until next Monday. As a conseqnence the week's business has been small, and in the mining market features of interest have been "conspicuous for their absence."

The Comstocks show a slight decline this week. Unless new developments are made at the Great Lode to warrant them, present prices will go still lower. By certain unmistakable symptoms we are led to believe that speculators in San Francisco cannot keep up an activity which is altogether fictitious, or prices which are unduly inflated. During the week Consolidated California & Virginia declined from $4.10 to $3.25; total sales, 350 shares. Of Crown Point there was a sale of 100 shares at $1.30. Belcher was very quiet, only one sale of 50 shares at $4 is reported. Gould & Curry declined from $1.50 to $1.10, with sales during the week of 400 shares. Of Hale & Norcross 250 shares changed hands at $1.55@$1.60. Ophir opened at $3.10 and declined to $2.50; sales during the week aggregated 250 shares. Of Yellow Jacket 260 shares were sold at $1.15@$1.55. Comstock Tunnel stock was quiet, only 700 shares being sold at 13c.; there were sales of the bonds, 2,000 at 17 and 19. We publish elsewhere in this issue an abstract of the last annual report of the Comstock Tunnel Company. Other sales were as follows: 100 shares of Alta at $1.35; 300 shares of Best & Belcher at $1.70@$2.20; 400 shares of Chollar at 90c.@$1.15; 200 shares of Julia at 16c.; 220 shares of Mexican at $1.80@$1.85, and 200 shares of Potosi at $1 05.

None of the Tuscarora stocks were dealt in during the week.

Of the California stocks Bodie Consolidated shows sales of 200 shares at 35c. Bulwer was stationary at 35c. with total sales during the week of 500 shares. Owing to a typograpical error the date of dividend No. 21 of the Bulwer Consolidated Mining Company, a notice of which was published in our last issue, was made to read as payable on October 21st. It should have read payable October 31st. Of Mono 800 shares were sold at 35@36c Plymouth Consolidated, which has not been traded in for a long time, this week shows sales of 380 shares at 70@90c. Sales of Brunswick Consolidated aggregated 2,800 shares at 8@10c. The superintendent of this company, writing under date of the 12th inst., says: "The situation at the mine shows no material change. The prospects in the drifts are about the same. The tests made daily show good milling pay ore. The shaft shows improvement, the foot wall coming up to its natural pitch. I look to get the high grade ore found in the shaft above the 600 ft. level. For the past week the East drift has been extended 8 ft.; total, 66 ft. West drift advanced 8 ft.; total, 76 ft. The shaft has been sunk 1 ft.; total, 26 ft. The width of the ledge in the drift is the same as last reported.

The Colorado stocks are quiet this week. Little Chief shows sales of 1,000 shares at 25c. No sales of other Colorado stocks are reported.

Ontario this week was dealt in to the extent of 120 shares at $40.50. Of Horn Silver 300 shares were sold at $3.60.

Alice was in good demand at 55@65c.; total sales aggregated 1,100 shares.

Phœnix of Arizona shows the largest transactions. During the week there was a steady demand for it and 5,600 shares were sold at 50@56c.

Boston, Oct. 19.

(From our Special Correspondent.)

There is a good degree of activity in the copper stocks, and the general tendency is to higher prices. The market is, however, purely speculative in its character, although we note some buying of the better class for investment; of these there are not many offering, and it is difficult to fill orders without advancing prices.

Boston & Montana continues to be the leader, and declines readily whenever there is any pressure to sell, and recovers quickly when the short interest tries to cover. The stock sold down to $33⅛ in the early dealings, with recovery to $37. and a subsequent decline to $35¾. at which figure sales were made to-day. Over 8,000 shares were traded in the past week.

Butte & Boston shows but little change, being made at $6¾@$9⅞, and a few small lots at $10.

Calumet & Hecla sold at $290, and later at $294.

Tamarack was in fair demand at $160.

Tamarack, Jr., declined to $19 for small lots.

Centennial, on better reports as to the late find in the mine, advanced from 6½ to 7¼, losing only ¼ in final dealings.

Franklin declined from $15 to $14¼ without any special reason assigned, but there is very little stock offering. Kearsarge has been in very good demand at $11¾ to $12, and its friends claim that it is worth a good deal more money. Osceola is one of the most active stocks on the list. Its prospects for dividends are considered good, and the price it is selling for is not high when compared with some others. It opened at $34¾, declined to $34, rallied to $36¼ and closed at $35½.

Atlantic sold at $10⅜ to $11¼ on small transactions.

Wolverine declined to $1½, but subsequently recovered to $2.

Allouez & Arnold were both inactive, with sales at $1 to $1¼ for the former, and $1½ for the latter.

We note a sale of Mesnard at 50c., and there is more inquiry for the low priced stocks, which may develop into activity later on.

Napa quicksilver sold at $5⅝ @ $5¾.

3 P. M.—The market after the noon hour developed more strength and prices advanced from $¾ to $1 per share on the leading specialties. Boston & Montana advanced from $35¾ to $36½, Osceola from $35⅛ to $36. Franklin sold at $14½ and Kearsarge at $15¼. Tamarack, Jr., was very strong on favorable news and sold up to $23, reacting only to $22½ on last sale.

MEETINGS.

Adams Mining Company of Colorado, at the office of the company in the city of Leadville, Colo., November 17th, at 12 o'clock noon. Transfer books close October 30th and reopen November 20th.

Chrysalite Silver Mining Company, at the office of the company, 13 Burling Slip, New York, November 2d, at 12 o'clock noon. Transfer books close October 26th and reopen November 3d.

Idaho Consolidated Mining Company, at the office of the company in New York, October 26th, at 3 P. M.

Standard Gold Mining and Milling Company, at the office of the company, 208 Century Block, Minneapolis, Minn., November 15th, at 10 A. M. Transfer books close November 5th and reopen November 16th.

DIVIDENDS.

Bulwer Consolidated Mining Company, dividend No. 21, of five cents per share, $5,000, payable October 24th, at the Farmers' Loan and Trust Company No. 20 and 22 William street, New York.

Daley Mining Company, dividend No. 68, of twenty-five cents per share, $37,500, payable October 31st, at the office of Messrs. Lounsbery & Co., No. 15 Broad street, New York. Transfer books close October 25th and re open November 1st.

Homestake Mining Company, dividend No. 171, of ten cents per share, 12,500, payable October 25th, at the office of Messrs. Lounsbery & Co., Mills Building. No. 15 Broad street, New York. Transfer books October 20th and reopen October 26th.

Ontario Silver Mining Company, dividend No. 197, of fifty cents per share, $75,000, payable October 31st, at the office of Messrs. Lounsbery & Co., Mills Building. No. 15 Broad street, New York. Transfer books close October 25th, and reopen November 1st.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am. per share.
Alpha, Con., Nev...	9	Sept. 2	Oct. 6	Oct. 27	.10
Atlas, S. Dak.....	6	Sept. 26	Oct. 31	Nov. 21	.001
Brunswick Con.,Cal	4	Sept. 29	Oct. 31	Nov. 17	.02
C'mm'nwe'lth Con., Nev	9	Sept. 7	Oct. 13	Nov. 9	.10
Crown Point, Nev..	58	Sept. 15	Oct. 20	Nov. 10	.25
Derbec BlueGravel, Cal	10	Sept. 14	Oct. 17	Nov 7	.10
Eureka Con. D., Cal	5	Sept. 19	Oct. 24	Nov. 14	.07
Jack Rabbit, Cal....	1	Sept. 17	Oct. 19	Nov. 8	.05
Kentuck Con.....	5	Oct. 5	Nov. 8	Nov. 29	.10
Mexican, Nev.....	46	Oct. 13	Nov. 17	Dec. 7	.25
North Belle Isle,Nev	2.	Sept. 11	Oct. 6	Nov. 7	.10
Northwestern, B. C.	5	Aug. 27	Oct. 24	Nov. 12	.20
Overman, Nev.....	65	Oct. 5	Nov. 1.	Nov. 30	.30
Savage, Nev.....	79	Oct. 7	Nov. 9	Nov. 29	.50
Silver King, Ariz...	8	Aug. 6	Oct. 7	Nov. 4	.25
South Eureka, Cal..	1	Sept. 10	Oct. 12	Nov. 1	.01
Yellow Jacket, Nev.	52	Sept. 5	Oct. 7	Nov. 10	.25

The total sales of Pipe Line Certificates at the Consolidated Stock Exchange for five days ending Oct. 20th amounted to 120,000 barrels.

METAL MARKET.

NEW YORK, Thursday Evening, Oct. 20, 1892.

Prices of Silver Per Ounce Troy.

Oct.	Sterling Exch'ge.	London. Pence.	N. Y. Cents.	Value of sil. in $1.	Oct.	Sterling Exch'ge.	London. Pence.	N. Y. Cents	Value of sil. in $1.
15	4·85½	39⅝	†	·661	19	4 85½	39¼	85¾	·657
17	4·85½	39⅝	86¼	·662	20	4·85½	39 1/16	85¾	·657
18	4·85½	39⅜	85⅛	·653	*21	....	....	....	....

*Holiday. † 86⅛ @ ⅝

Silver has been firmer owing to a combination of circumstances. The surplus put on the New York market over Government needs shows a reduction as compared with the offerings a few months back.

The prospect of the monetary conference offering some suggestions of a practical character, which, while not making any radical changes, would have a temporary support to silver, gives a moral tone to the situation. It is also to be observed that trade relations in the East have improved, especially in China. And this improvement has occasioned the large shipments of bullion which have gone this year to the Orient.

There were sold during the week ending Friday, October 22d, 1,078,000 ounces in silver bullion certificates, at from 85 to 87¼ cents per ounce.

The United States Assay Office at New York reports the total receipts of silver for the week to be 127,000 ounces.

Government Silver Purchases.

The Government has purchased during the week the following quantities of fine silver at the accompanying prices per fine ounce:

October 17th, 702,000 oz. at 86·6c. to 86·9c.
October 17th, 399,000 oz. at 85·9c. to 86·25c.
Total to date, 3,181,000 oz.

Friday being a holiday, no offers will be considered by the Treasury Department until Monday, October 24th.

Gold and Silver Exports and Imports at New York for Week Ending October 15th, 1892, and for Years from January 1st, 1892, 1891.

	Gold.		Silver.		Excess. of
	Exports.	Imports.	Exports.	Imports.	Exports.
Week..	$9,665	$7,167	$121,200	$14,000	$112,638
1892.....	58,786,053	7,031,454	19,938,744	2,130,821	66,562,532
1891.....	75,331,472	18,926,903	14,508,071	1,798 698	69,113,942

During the week ending October 22d, the exports and imports, so far as ascertained, have been as follows: Exports, gold, $257,220; silver, $235,625. Imports, gold, $252,530; silver, $191,258. The greater part of the gold imported was French coin, that exported was Spanish coin to Havana. All but $57 of the silver imported was foreign silver coin, all that exported was Mexican coin, and it went to England.

NOTES OF THE WEEK.

The excess of exports is now nearly the same as that of last year, although there is a difference of nearly 17,000,000 in the amounts of gold exported in the two years. The reason for this is to be found in the fact that gold is not returning to us so fast as it did last year.

We very greatly regret to learn that Gen. Francis A. Walker has been compelled to decline his appointment as delegate to the International Monetary Conference. President Harrison has nominated Mr. E. B. Andrews, president of Brown University, to fill the vacancy. Prof. Andrews is a recognized authority on political economy and has made a special study of monetary questions.

A cablegram from London of October 18 states that the Italian government contemplates appealing to the Conference to withdraw the sanction of legal tender from small silver coin outside of the country of issue, the object being to prevent the outflow of small coin through operations of smugglers, which all legal means have hitherto failed to accomplish. If carried into effect a large amount of Italian small coin now held in France would have to be redeemed by the Italian government.

According to a late press dispatch from London, Austria continues to draw gold on every available occasion. Russia also is demanding gold, and the contemplated Chilian loan will entail still further shipments. It is probable that these different demands have had something to do with the small amounts sent to this country.

Domestic and Foreign Coin.

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

	Bid.	Asked.
Mexican dollars.....	$ .67½	$ .68
Peruvian soles and Chilian pesos.....	.61	.63
Victoria sovereigns.....	4.85	4.90
Twenty francs.....	3.86	3.90
Twenty marks.....	4.74	4.78
Spanish 25 pesetas.....	4.78	4.81

Copper.—The market remains firm, though during this week there has not been much doing, consumers not caring to pay the higher prices asked and sellers not caring to part with their holdings except at good prices. The reports that the Anaconda is to close down on the 10th proximo, or thereabouts, has gained strength, but yet it will not do to place much reliance on this occurring, though should it take place the price of copper ought to advance materially, as production will thus be decreased at the rate of 35,000 tons per annum. The price of lake copper we have to give nominally as 12c., but second hand parcels, of which there are but few, might still be bought at a little less. For casting copper the demand is quite good at 10¾c., while Arizona pig copper, 96%, is reported to have sold at 10c.@19¼c., mostly at the latter figure. The European market shows considerable firmness and a pretty large business has been done from day to day. G. M. B. Copper closes firm at £45 15s. for spot and £46 5s. for three months prompt, and the rise in silver is reported as having caused a large business in copper and yellow metal with India. For manufactured we quote:

English tough, £48@£48 10s.; best selected, £49@£49 10s.; strong sheets, £55 10s.@£56; India sheets, £52 10s.@£53; yellow metal sheets, 5d.

Copper statistics show an increase of 1,800 tons for the first half of this month.

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

To Liverpool—		Lbs.	
S. S. Naronic.....	Copper Matte.	240,747	$12,000
To Liverpool—	Copper.	Lbs	
S. S. Aurania.....	17 pigs.	3,463	$350
To Rotterdam—	Copper.	Lbs	
S. S. Werkendam	540 bbls.	675,000	$77,625

Tin has been rather irregular this week. On Saturday last a fairly large business was done at 20·80 for spot and October metal, but on Monday the price went up to 20·90@20·95. Then came a reaction, caused by the manipulations in the London market, and prices dropped to 20·70, only to gain new strength and advance to the closing figures of 20·80 for spot and October and 20·90 for November and December, the tendency being firm, owing to the good rate of consumption. In London a large business was done, especially on the days on which the decline was most marked, and it becomes more and more evident that strong hands abroad are trying to accumulate stocks. The closing quotations are £95 6s. 6d. for spot and £95 for three months prompt.

Lead is dull and lifeless, and the few transactions have been at the last figures reported. We have to quote about 4@4·025c. New York. The foreign market is rather weaker and Spanish lead is now obtainable at £10 7s. 6d and English at £10 10s.

Spelter.—Most smelters appear to be well sold out for the balance of this and the first half of next year, and with the winter coming on, and the uncertainty always experienced then regarding supplies, better prices are looked for. We hear that, with the exception of two smelters, who have a little, there is not one who has any stock on hand. The galvanizing trade is reported to be very active, and we quote 4·425@·45 New York. In Europe there is a better feeling, and prices have now recovered, being quoted at £19 for ordinaries and £19 5s. for specials.

Antimony shows a decided improvement, Cooksons now being held for 12c., L. X. for 11⅛@¼ and Hallett's at 10¾.

Nickel is steady.

IRON MARKET REVIEW.

NEW YORK, Thursday Evening, Oct. 20, 1892.

Pig Iron Production.—The following table gives the number of furnaces in blast and the estimated production of pig iron in the United States during the week ending Saturday, October 17th, 1891, and for the coresponding week ending October 15th, 1892. Also the total estimated production from January 1st of last year to these dates. This table has been corrected by the official returns of the American Iron and Steel Association for the first six months of each year. The figures are in gross tons.

Pig Iron Production During Week Ending October 17th, 1891 and October 15th, 1892, and During Both Years to Date.

Fuel used.	Week ending—				From Jan. '91.	From Jan. '92.
	Oct. 17, 91.		Oct. 15, '92.			
	F'cs.	Tons.	F'cs.	Tons.	Tons.	Tons.
Anthracite..	86	33,500	67	29,500	1,468,860	1,385,796
Coke	162	135,300	129	120,000	4,258,600	5,432,700
Charcoal....	59	12,900	40	9,200	440,127	424 325
Total.....	306	181,700	236	158,700	6,167,527	7,242,821

The pig iron market has been quite uneventful during the last week, and no indications of large buying or variation in prices is recorded. Buying is restricted in this district to small parcels for quick delivery, and very little future contracting is being done. The outlook in the market generally is without doubt stronger than it has been for some three or four months now. The production is increasing slightly, and also the stocks are being reduced, so that the consumption is becoming more healthy. This improved state of the market has not had any effect yet on buyers who have been holding off for some considerable time in anticipation of a further fall in prices. It is probable now, however, that buyers will become a little more ready to trust themselves with forward contracts. We believe the state of the market warrants the laying in of stocks and the providing for forward delivery, as any fall in price at present is unlikely, and difficulties may be met with soon in concluding transactions with dealers. The attitude of the Southern producers is becoming more promising. They continue to refuse to do business at all at the low figures recently accepted, and they are also threatening to advance their schedule rate by 25 cents all round. This action on their part will certainly be for their own good and the Northern producers are exceedingly glad of it. It is probable that this attitude of the Southern producers will help very considerably in strengthing the general prices in the North and will have only a second influence to the increase of consumption in rehabilitating the pig iron market. Prices still continue at No. 1, $15; No. 2, $14, and grey forge $13 to $13.50 at tide water.

Spiegeleisen and Ferromanganese.—Nothing is being done in spiegeleisen, and the nominal price is $27. There has been a good deal of activity in ferromanganese, as we predicted a fortnight ago. The Columbus celebration last week interfered with transactions, and this week another hindrance has been met with. The buyers mostly want to contract for five or six months ahead, and dealers will not dispose of their imported article for 1893 delivery owing to the uncertainty of future supplies. Consequently the amount of business done is not so great as it otherwise would have been, but probably buyers will have to come to dealers' terms, as it would be impossible to sell ferro for next year's delivery when it is doubtful whether there won't be sufficient supply of foreign bars then. The price may be quoted at $61 for early delivery of 80% quality.

Steel Rails.—The same report is given in steel rail circles this week as we have been accustomed to for some months back. There are no new orders coming on and the mills are entirely confined to work on regular renewals. The steel rail producers have, however, plenty of work on billets and structural material, so that they do not feel the depression in steel rails. The price is as usual, $30 at mill and $30.75 at tide water.

Rail Fastenings.—No new orders are reported in track material. Prices rule as follows: Fish and angle plates, 1·55@1·65c. at mill; spikes, 1·90@2c.; bolts and square nuts, 2·40@2·70c; hexagonal nuts, 2·70@2·80c., delivered.

Merchant Iron and Steel.—There is no feature of interest to report in the markets for the various branches of merchant iron and steel. The orders are few and in small parcels. There is no variation in prices, which stand as follows: Mushet's special, 48c.; English tool steel, 15c. net; American tool steel, 6½@7½c.; special grades, 13@18c.; crucible machinery steel, 4·75c.; crucible spring, 3·75c.; open hearth machinery, 2·25c.; open hearth spring, 2·50c.; tire steel, 2 25c.; toe calks, 2·25@2·50c.; first quality sheet, 10c.; second quality sheet, 8c.

Structural Iron and Steel.—The most interesting item of news this week is that contracts have just been signed for two important extensions of the Brooklyn Elevated Railroad. One contract refers to the extension from the present terminus of the Fulton Avenue line to Cypress Hill Cemetery, and the other refers to the South Brooklyn extension from Thirty-eighth street and Fifth avenue to Sixty-seventh street and Third avenue, with a branch line to Thirty-ninth street ferry. The former calls for 4,000 tons of structural steel and has been let to the Edge Moor Bridge Works, at Wilmington, Del.; and the latter calls for 6,000 tons of structural steel and has been let to Cofrode & Saylor, of Philadelphia. Mills in this district are much disappointed that the orders have gone Philadelphia way. The all-round price is said to have been 3c. erected, an exceedingly low price, perhaps the lowest on record. There are plenty of other orders on hand and new ones are coming in well. There is a very pleasing prospect for many months to come for structural iron people, and this branch of the iron and steel trade exhibits the greatest strength and prosperity of any. A large quantity of 20-in. German beams have been disposed of lately here at the average price of 2·25c., an extremely low rate. This importation of broad beams from Germany is due to the great scarceity of the domestic article lately. Prices in structural material vary a good deal, according as to whether the deliveries are to be quick or to be spread over the winter months. The following list shows a considerable latitude accordingly: Beams, 2 3@2·55c., except for 20 in. beams which are 2 75c.; angles, 1·95@2·15c.; sheared plates. 1·90@2·10c.; tees, 2·30@2.60c.; channels, 2·35@2·50c.; universal plates 2@2·10c.; bridge plates, 2@2.10c.; steel hoops, 1·90c.@8c. All on dock.

Buffalo. Oct. 19.

(Special Report by Rogers, Brown & Co.)

With evidences of improvement all around us we are still unable to see any change for the better in this immediate vicinity. In fact the market is exceptionally quiet. Iron is being used largely, the quantity called for on old orders being more than enough to tax the carrying capacity of all the cars obtainable. The advance in prices among the Southern furnaces does not seem to have caused a ripple here and buying goes on even more slowly, if possible, than for the six month past. We quote for cash f. o. b. cars Buffalo. No. 1X Foundry Strong Coke Iron Lake Superior ore, $15.25; No. 2X Foundry Strong Coke Iron Lake Superior ore. $14.25; Ohio Strong Softener No. 1, $15.25; Ohio Strong Softener No. 2, $14.25; Jackson County Silvery No. 1, $17.30; Jackson County Silvery No. 2, $16.80; Lake Superior Charcoal, $16.50; Tennessee Charcoal. $17; Southern Soft No. 1, $14.15; Alabama Car Wheel, $19; Hanging Rock Charcoal, $20.50

Chicago. Oct. 20.

(From our Special Correspondent.)

The present volume of business in Chicago is extremely large and in the opinion of experts is fully ten to twenty per cent. greater than ever before, with an outlook that was never more promising than now. The building boom this year, irrespective of that in the neighborhood of the World's Fair at Jackson Park, has been exceeded once only, the year after the great fire in 1871. This has necessitated the use of immense quantities of iron and steel, so that while the iron trade elsewhere was dull it was comparatively active here.

The market for crude iron continues fairly active, and while transactions as a whole have not been as heavy as they were earlier in the month, there is enough business to go around. Inquiry is good for local as well as Southern coke iron, and some of it is for good sized quantities. The advance made by leading Southern furnaces is steadily maintained, and quite large tonnage has been booked at the advanced price, With regard to finished iron and steel the outlook is very encouraging. Thus, while business for prompt or nearby deliveries is moderately good and values steady, the tendency to a lower range of prices for shipment late in December and next year is becoming more prominent. Some contractors are already holding aloof in hopes of obtaining better figures a little later.

Pig Iron.—Probably the most encouraging feature of the steady maintenance of prices and trade is the further reduction in stocks of coke and charcoal iron. Demand for coke iron of local make is fair; current prices decidedly firmer and quotations more closely adhered to. This latter has to some extent caused consumers to act more conservatively in the matter of placing orders, and the buying last week was not as heavy as the week previous. Some agents believe that the falling off is attributable to the large sales made early in the month. Anyhow sales of local iron have been lighter. Southern iron is in good demand and inquiry large, mostly for strong foundry and soft grades. Consumers are becoming convinced that the advance has come to stay for awhile and transactions are of good volume. Lake Superior charcoal iron is stronger and inquiry better. A few sales of several hundred tons have been made at $16.50@17, according to quality.

Quotations per gross ton f. o. b. Chicago, are:

Lake Superior charcoal, $16.55@$17.00. Lake Superior coke, No. 1, $14.25@$14.75; No. 2, $13 50@$14; No. 3, $13.25@$13.75; Lake Superior Bessemer, $16.50; Lake Superior Scotch, $15@$15.50; American Scotch, $16.50@$17.00; Southern coke, foundry No 1, $14.50; No. 2, $13.25; No. 3, $12.50; Southern coke soft, No. 1, $13.25; No. 2, $12.75; Ohio silveries, No 1, $17; No. 2, $16.50; Ohio strong softeners, No. 1, $17; No. 2, $16.50; Tennessee charcoal, No. 1, $17; No. 2, $16.50; Southern standard car wheel, $20@$21.

Steel Billets and Rods.—Several large orders are pending for billets, and quotations are unchanged at $24.50. Rods are in steady demand at $34.50.

Structural Iron and Steel.—Demand for material for this season is now limited, hut inquiry for next year is large, and there is a vast amount of work in sight. Contracts for another million dollar bridge across the Missouri at Sioux City, Ia., have been let. Quotations, car lots f. o. b. Chicago, are as follows: Angles, $2@$2.10; tees, $2.30@$2.40; universal plates, $1.95@$2; sheared plates, $1.95@$2; beams and channels, $2.25@$2.50.

Plates.—Mill business is fair for small to medium sized quantities, and price depends materially according to shipment; if required this year they are steady, if next year, concessious are made. Store trade is moderate. Steel sheets, 10 to 14, $2.30@$2.40; iron sheets, 10 to 14, $2.20@$2.30; tank iron or steel, $2.10@$2.15; shell iron or steel, $2.75@$3; firebox steel, $4.25@$5.50; flange steel, $2.75@$3.00; boiler rivets $4.00@$4.15; boiler tuhes, 2¾ in. and smaller, 60%; 7 in. and upward, 70%.

Merchant Steel.—Specifications for merchant steel on account of contracts alread placed and for material for immediate shipment are active. Manufacturers are well pleased with the volume of trade in progress in this line. A fair demand is noted for tool steel. We quote tool steel, $6.50@$6.75 and upward; tire steel, $2.10@$2.20; toe calk, $2.40@$2.50; Bessemer machinery, $2.10@$2.20; Bessemer hars, $1.75@$1.80; open hearth machinery, $2.40@$2.60; open hearth carriage spring, $2.25@$2.30; crucihle spring, $3.75@$4.

Galvanized Sheet Iron.—Business is much restricted on account of overcrowded condition of mills result ng in slow shipments. Large lots are quoted at 70% off on Juniata and 70 and 10% off on charcoal and jobbing quantities at 67½% off on the former and 70% off on the latter.

Black Sheet Iron.—Demand is quite good and prices are steady at 2·05@2·95c. for No. 27 common. Soft steel sheets are 10c. higher. Dealers quote 3·10c. from stock.

Bar Iron.—Mills in this vicinity, despite the continued good demand, are inclined to shade quotations, and 1·60c. Chicago is common. Youngstown mills, however, refuse to quote less than 1·50c. rates, with half extras at mill, and with the present condition of trade lower figures are unwarranted. Warehouse trade is active at 1 80@1·90c. rates.

Nails.—Steel cut are not held as firm by makers and $1.65, 30c. average, is shaded on round lots from mill. Johhers quote $1.70 from stock, and business fair. Wire nails are more active at $1.60 base f. o. b. Chicago in quantities. Jobbing quotation is $1.70 in less than carloads.

Steel Rails.—It is a little early yet for railroads to place contracts for the coming year, and orders for immediate shipment are limited to very moderate sized quantities. Local mills, however, are well satisfied with the outlook, which they consider equal to that of a year ago. Standard sections are steady at $31@$32.

Scrap.—There is a better inquiry in the market, and orders for small lots are frequent. Quotations are somewhat firmer. No. 1 railroad, $15; No. 1 forge, $14; No. 1 mill, $9.50; fish plates, $17; axles, $19; horseshoes, $15.50; pipes and flues, $7; cast borings, $5.50; wrought turnings, $8; axle turnings, $9.50; machinery castings, $10; stove plates, $5.50; mixed steel, $10.60; coil steel, $14; leaf steel, $15; tires. $14.50.

Old Material.—A consumer bought 500 tons of iron rails at $18.25, which is regarded as high Dealers, though who are asking more for round lots. Steel rails are quiet at $12.50@$14.50 according to length, etc. Car wheels show no movement at $14.50 @$15.

Louisville. Oct. 15.

(Special Correspondence of Hall Bros. & Co.)

The developments of the past week have been such as to give further confidence, hut furnaces appear conservative and apparently do not wish prices unwisely advanced and the small increase that has already heen made can no doubt be maintained. While stocks have been materially reduced (and will douhtless continue to diminish if conservatism prevails) the output is increasing and many plants now idle are ready to blow in as soon as signs indicate a probahle profit. With prices kept at a reasonahle level until available stocks have been largely cut down, the improvement would he more permanent and more advantageous to all, hut if prices are hastily and unwisely raised in advance of the real merits of the situation, it would simply encourage excessive production and allow available stocks to remain large, and the producers would likely soon lose the natural advantage to he gained by a conservative policy in not advancing prices hevond reason, for it is a conceded fact that available stocks to draw from, even though only a few weeks' supply, has naturally a depressing iufluence upon prices. Es pecially would this he true if many idle plants should start up, and there should he a slacking up in the huying movement, as it would not only leave stocks heavy, but would leave an excessive active production, whereas if prices are kept below the point of inducing idle plants to start up for some months yet, the indications are favorable for some permanency in demand and improved prices.

Hot Blast Foundry Irons.—Southern coke No. 1, $13@$13.50; Southern coke No. 2, $12.25@$12.50; Southern coke No. 3, $11.75@$12; Southern charcoal No. 1, $16@$17; Southern charcoal No. 2, $15.00@$15.50.

Forge Irons.—Neutral coke, $11.50@$12.00; cold short, $11.25@$11.50; mottled, $10.75@$11.

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

Philadelphia. Oct. 20.

(From our Special Correspondent.)

Pig Iron.—Statements of brokers and agents happen to he strangely contradictory to-day, and yet market conditions and quotations are probably about what they were last week. There is an uncertainty among large huyers whether or not to follow up the policy of huying for winter delivery. This week's course shows that very little of this will he done at present. Incorrect statements are being made in some quarters relative to the tone of the market. Shrewd huyers can ohtain iron as low as at any time, provided they do not insist on certain oversold brands. Quotations for No. 1 continue at $14.50 to $15.50; No. 2, $13.50 to $14. Forge, $13 for the hetter hrands. Bessemer has been taken, but the market is likely to remain inactive for two or three weeks to come.

Foreign Material.—Brokers are endeavoring to sell ferro-manganese for winter, but buyers have done nothing whatever.

Steel Billets.—This has been an off week in billets, and nothing is likely to he done before next week. Quotations, $25@$25.50.

Muck Bars.—An effort has heen made by agents of mills to make a few contracts at an advanced price, This is a had time for such an experiment. The week's business has heen unimportant.

Merchant Iron.—The week will be the poorest we have had for some time. Very little new business has been done. Car builders have declined to extend contracts. A rumor is out that some mills are again shading quotations. The average figures are $1.70 to 1.80.

Nails.—The stores are getting rid of nails very well considering the lateness of the season.

Skelp.—One or two good-sized skelp orders have heen secured. The market is strong.

Pipes and Tubes.—The market has remained quiet, but the agents of mills say there is a large amount of business visihle, which, if secured, will further help to strengthen prices.

Sheet Iron.—The mills have no husiness to report, hut the distribution from stores is quite large, and work is heing crowded at all points.

Plate and Tank Iron.—The plate mills are all crowded, as usual. The activity is very gratifying to the plate mill men. The usual brilliant anticipations are indulged in, relative to an abundant winter's business at pretty good prices.

Structural Material.—The market is very strong, though new orders this week have heen trifling. Quotations are unchanged. Some hig orders are predicted for next week,

Steel Rails.—Dull at $30.

Pittsburg. Oct. 20.

(From our Special Correspondent.)

Raw Iron and Steel.—The market during the week has shown up reasonably well so far as the volume of business is concerned. Prices for certain kinds of material are down to a very low figure. In conversation with a leading consumer of pig iron, he remarked: "Prices are considerable helow what they ought to he. I believe it would he better for all parties if raw iron was $1.50@$2.00 per ton higher. There is certainly scarcely any profit to makers at present prices. My faith is so strong that prices will soon take an upward movement that I never allow my stock of pig iron to he reduced helow 3,000 to 3,500 tons, so as to he ready for what will take place in the near future."

The party who made the ahove remarks has a large mill and has heen engaged in the iron business all his life. Production is gradually being curtailed, and it is now down to wholesome proportions. Mill and foundry irons seem to have heen the first to receive the improving impulse; but Bessemer pig iron and steel slabs and billets continue to manifest stubbornness. The easiest way to explain why such a discrepancy exists is to fall hack on supply and demand and attribute the comparative weakness in the soft steel products to the lack of active demand for them. Prices, without exception, are the lowest ever recorded.

"Cold Shuts" remedy to make better times is a good one; here it is: "Intellectual capacity and nerve, or sand, as the slang men put it, is the combination that never stops to consider difficulties, or create imaginary obstructions, hut it goes in to win, and, unless the possihilities directly oppose it, it wins. Do your own fighting with destiny, therefore, you that are pricked by the necessity for diversification and relief, and may success and much of it attend your efforts." A dispatch from Youngstown says "Harry Evans," secretary of the Iron Manufacturers' Association, has prepared a detailed statement of the twelve months' shipments in and out of the valley.

The shipments from the rolling mills, in gross tons, were: Muck har, 13,500; finished iron, 278,000; mill cinder, 57,500. The pig iron shipments from the hlast furnaces are 448,000 gross tons. Julian Kennedy is chief engineer of the construction of the Ohio steel plant to he huilt here.

An Eastern iron merchant has this to say: "The steady improvement in the iron trade is exercising a perceptible influence upon consumers of pig iron who are manifesting greater eagerness to place orders for future delivery. The present output and more is heing taken, and although the capacity in blast is expanding, there is no probahility that the production will greatly exceed the demand for a long time at least. The sellers feel decidedly that the advantage is with them, and uniformly decline to accept long time contracts at present prices. Rumors of an advance in all three grades are in circulation, hut meet with an emphatic denial."

PITTSBURGH, Oct. 20 (*by Telegraph*).—Billets have advanced to 24 at maker's mill with sales at that figure.

Coke Smelted Lake and Native Ore.

6,000 Tons Bessemer, Nov., Dec.	$13.60 cash.
2,500 Tons Grey Forge, Jan., Feb., 1893.	12.40 cash.
2,000 Tons Bessemer	13 75 cash.
2,000 Tons Grey Forge	12.50 cash.
2,000 Tons Bessemer, Oct., Nov	13.70 cash.
1,000 Tons Grey Forge	12.50 cash.
1,000 Tons Grey Forge	12.50 cash.
1,000 Tons Bessemer	13.80 cash.
500 Tons Grey Forge	12.50 cash.
500 Tons Grey Forge	12.50 cash.
300 Tons Bessemer	14.00 cash.
200 Tons No. 1 Foundry	14 50 cash.
200 Tons No. 2 Foundry	13.50 cash.
100 Tons No. 1 Silvery	16 50 cash.

Charcoal.

100 Tons Lake Superior, Foundry	19.00 cash.
100 Tons No. 3 Foundry	18.90 cash.
100 Tons Cold Blast	26.00 cash.
75 Tons Warm Blast	18.00 cash.
50 Tons No. 1 Foundry	20.00 cash.
50 Tons Cold Blast	25 00 cash.
25 Tons No. 2 Foundry	18.90 cash.
5,000 Tons Billets, del. next 4 mos.	22.75 cash.
5,000 Tons Billets, del. next 4 mos.	22.75 cash,
3,000 Tons Billets and Slabs, Nov., Dec.—Jan., 1893	23.50 cash.
2,500 Tons Billets, Oct., Nov., Dec.	23.50 cash.
1,000 Tons Billets	22.75 cash.
1,000 Tons Billets, at maker's mill, Wheeling	22.25 cash.

Muck Bar.

2,000 Tons Neutral	24.75 cash.
1,000 Tons Neutral	24 75 cash.
600 Tons Neutral	24.60 cash.

Iron Skelp.

700 Tons Narrow Grooved	1.65 4 m.
600 Tons Wide Grooved	1.62½ 4 m.
450 Tons Sheared Iron	1.87½ 4 m.

Steel Skelp.

800 Tons Wide Grooved	1 50 4 m.

Spelter.

150 Tons Spelter, Oct., Nov.	4.30 cash.

Steel Wire Rods, Five Gauge American.

500 Tons five gauge American at Mill	30.50 cash.

Sheet Bars.

400 Tons Sheet Bars	30.00 cash.

Ferromanganese.

50 Tons, 80 per cent. Imported	63.00 cash.
50 Tons, 80 per cent. Domestic	62.50 cash.

Old Iron and Steel Rails.

1,000 Tons American T's	20.50 cash.
1,000 Tons American T's	20.75 cash.
500 Tons Old Steel Rails	16.00 cash.

Scrap Material.

350 Tons Tank and Cut Pipe, net	14.00 cash.
300 Tons No. 1 R. R. W. Scrap, net	15.50 cash.
250 Tons Iron Axles, net	23.75 cash.
200 Tons Iron Axles, net	25.00 cash.
200 Tons Mixed Turnings, gross	10.00 cash.
100 Tons Cast Borings, gross	7.00 cash.
100 Tons Iron Axles, net	24.30 cash.
100 Tons Wrought Turnings, net	10.25 cash.
50 Tons Cut Horse Shoes, net	23.00 cash.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Oct. 21.

Statement of shipments of anthracite coal for month of September, 1892, compared with the corresponding period last year:

Compiled from the returns furnished by the mine operators.

Regions.	Septemb'r, 1892.	Septemb'r, 1891.	Difference.
	Tons.	Tons.	
Wyoming Region	2,065,502.12	1,741,227.08	I. 324,230.04
Lehigh Region	578,243.09	531,507.09	I. 46,736.00
Schuylkill Region.	1,116,390.01	1,060,624.13	I. 55,765.08
Total	3,760 136.02	3,333,404.10	I. 426,731.12

Regions.	Year to date, 1892.	Year to date, 1891.	Difference.
Wyoming Region	16,800,802.10	15,020,092.01	I. 1,780,710.09
Lehigh Region	4,552,644.14	4,514,357.11	I. 38,307.03
Schuylkill Region	9,158,257.05	8,701,823.11	I. 456,433.14
Total	30,511,724.09	28,236,273.03	I. 2,275,451.06

The stock of coal on hand at tide-water shipping points,

September 30th, 1892, was 638,301 tons; on August 31st, 1892, 691,399 tons; decrease, 53,098 tons.

Statement of shipments of anthracite coal (approximated) for week ending October 15th, 1892, compared with the corresponding period last year.

Regions.	Oct. 15, 1892.	Oct. 17, 1891.	Difference.
	Tons.	Tons.	Tons.
Wyoming Region....	502,438	506,605	Dec. 4,167
Lehigh Region.....	158,668	138,902	Inc. 19,766
Schuylkill Region....	302,081	341,252	Dec. 39,171
Total.....	963,187	986,759	Inc. 23,572
Total for year to date	32,540,358	30,619,102	Inc. 1,921,266

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

EASTERN AND NORTHERN SHIPMENTS.

	1892. Week.	1892. Year.	1891. Year.
Phila. & Erie R. R.....	1,942	69,033	135,350
Cumberland, Md.....	79,465	2,982,032	3,277,034
Barclay, Pa.....	724	55,910	148,602
Broad Top, Pa.....	16,403	484,241	393,754
Clearfield, Pa.....	83 968	3,126,778	3,142,079
Allegheny, Pa.....	28,503	1,004,833	1,003,823
Beach Creek, Pa.....	32,743	1,847,622	1,904,948
Pocahontas Flat Top.....	57,252	2,054,025	1,820.298
Kanawha, W. Va.....	*53,154	1,932,513	2,115,220
Total.....	354,154	13,556,997	13,941,108

* Week ending October 7th.

WESTERN SHIPMENTS.

	1892. Week.	1892. Year.	1891. Year.
Pittsburg, Pa.....	25,635	998.914	987,724
Westmoreland, Pa.....	40,804	1,353,551	1,538,907
Monongahela, Pa.....	14,379	514,351	464,066
Total.....	80,818	2,866,816	2,990,697
Grand total.....	434,972	16,423,813	16,931,805

PRODUCTION OF COKE on line of Pennsylvania R.R. for the week ending October 15th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 101,224 tons; year 4,235,848 tons; to corresponding date in 1891, 3,297,731 tons.

Anthracite.

The anthracite coal market exhibits the same dullness that has characterized it for a month past. The impression that the present state of things cannot exist forever is becoming stronger every day among consumers in the East and North, and current orders in consequence are confined strictly to immediate needs. There is hardly any buying in advance and no such thing as speculation is to be observed. The universal feeling with regard to the future is that prices will be caused to fall in a natural manner and subject to the law of supply and demand, even if nothing is effected by the many lawsuits at present on hand.

The stocks at all points are full to overflowing and the coal cars are ranged in multitudes along the railroads waiting for delivery. The Columbus celebration in New York last week inteferred very greatly with freight traffic and it is not yet in regular order again. Reports come to hand from Philadelphia and the South and West to the effect that shipments are delayed from the same cause, and also that freight traffic has not yet recovered from the cessation of transport during the encampment of the Grand Army of the Republic at Washington a month ago. Consequently from many parts of the South and West the demand for immediate supply is somewhat pressing.

We have in our last two reports mentioned our doubts as to the future of prices in the East and North. We are of opinion that the presence of great quantities of coal at all points that is blocking the way to further output is causing the Reading and its allied companies a good deal of trouble and anxiety. We believe that the time is not far off when the unrestriction of production and the continued holding off of large orders on the part of consumers will make it necessary for the sellers to shade prices if not officially reduce the schedule; that is supposing that no legal remedy is found for the present artificially advanced ratio. Such a remedy as the latter appears to be within measurable distance at present on account of the events hereafter mentioned; but after all the regulation of prices by the law of supply and demand is the only stable and really effective method of governing the cost of a commodity and therefore to that remedy we trust the most surely.

After writing the above paragraph the news comes from Philadelphia, with what basis of fact we are unable to say, that the Reading company is beginning to shade coal prices in the North in order to move the tonnage. It is said that the sea freight from New York to Boston is being cut 50 cents and more a ton, and that a good deal of Wilkesbarre coal is being moved in this way.

As announced in the table at the head of this report, the production of anthracite during the month of September was 3,760,136 tons, an amount 426,731 tons greater than the production in September, 1891, and 760,136 tons greater than the amount allotted for the month by the producers.

The amount sent to market during the first nine months of the year is greater by 2,275,451 tons, or 8·05%, than the production during the corresponding period of 1891. The figures for September plainly show that the "combine" has not been effective in one of its objects, *i. e.*, the restriction of the output; shortly we shall see that it bas failed also in its other and more important object, the sustaining of the price at a higher level than the market justified. Three weeks ago, at their meeting, the authorities recognized the fact that it was useless to announce an output for the succeeding month, as such a proceeding had hitherto always proved itself to be nothing but a solemn farce. At present the output is only restricted by the supply of empty coal cars at the mines.

At a meeting of the Board of Managers of the Philadelphia and Reading Railroad Company on Monday, Mr. E. P. Wilbur, president of the Lehigh Valley Railroad Company, was elected a member in place of Mr. Thomas Cochran, resigned. The object of Mr. Cochran's withdrawal is to enable the Lehigh Valley to have representation in the Reading Board, and thus solidify the interests of the two systems. Mr. Cochran, who has been in the board during the whole reconstruction period, does not now represent any distinct interests in the Reading, so that his resignation is not significant. His advanced years have made it necessary for him to retire from active work.

Another, and perhaps the most serious of the many laws against the Reading "combine," has been brought by the Attorney-General of New Jersey before Chancellor McGill, in the Court of Chancery of New Jersey. On Monday last the Attorney-General appeared before Chancellor McGill and began proceedings against the Central Railroad of New Jersey, the Port Reading Railroad and the Philadelphia & Reading Railroad, charging them as a combination with having advanced the price of coal in defiance of the recent order of the Cout. The Attorney-General asked for the appointment of a receiver for the roads to enforce the former decree of the Court, and to restrain the combination from using the New Jersey railroads for carrying any coal until the advanced prices shall have been reduced. Evidence was submitted by the Attorney-General to bear out his assertion that the combine had advanced the price of coal since it was enjoined from so doing. Attached to the papers were affidavits from Newark coal dealers declaring that the price of coal had been raised three times since the injunction was granted, and asserting that these advances had been caused by the agents of the railroads of the combination. The coal circulars of the agents were made part of the evidence, as were the admissions of President McLeod before the Senate Investigating Committee of this State. Chancellor McGill, after reading the papers, directed that a rule to show cause be issued, returnable on Oct. 27th next.

Attorney-General Stockton then filed an information against the operation by the combination of the Eastern Amboy Railroad and the Lehigh Valley Terminal and Bound Brook railroads. These roads were not included in the first proceeding against the "combine." This information sets forth that under the decision already rendered the operation of these roads by the Reading is a usurpation of authority and unauthorized by law. It mentions the participation of the Lehigh Valley in the combination, and that road's lack of power to control or lease the Easton and Amboy without legislative sanction, being itself a foreign corporation. The information further recites the proceedings in the Central of New Jersey case and the responsibility of the Lehigh Valley for the acts of all the "conspirators." The information concludes with a prayer restraining any of the New Jersey roads from carrying any of the combine's coal until the prices, which were advanced in violation of the injunction already granted, shall have been reduced, and also that a receiver be appointed to take charge of the New Jersey roads, with power to enforce the order of the court. The Chancellor signed the order in accordance with the prayer, and made it also returnable on October 27th.

This action is causing the various companies in the deal more uneasiness than any previous action, not even excepting the Vail case, on which, by the bye, judgment has not yet been given. It is conceded on every hand that the step is bold and high-handed, but it certainly appears to come within the power of the New Jersey Court of Chancery to appoint a receiver to carry on the business. The alternative of either restoring the price of coal to its old level or being forbidden to carry coal in New Jersey means financial ruin to the Reading roads under present circumstances; and if they accept the latter alternative we fail to see how the New Jersey people will be benefited. If the State receiver were appointed to carry on the business in the place of the ordinary officials the business would be practically a State railroad. The defense will be of course that the railroads in New Jersey have not put up the price of coal, as their freight rate has not been increased in that State, and that the companies who have put up the prices are the coal companies, whose headquarters are not in the State of New Jersey, but in Pennsylvania, and, therefore, are out of the jurisdiction of the Jersey Court of Chancery. This is a technical point which will weigh against the Attorney General's motion, and he will consequently be obliged to bring up some further refinement in the law to clinch the argument.

Bituminous.

The state of the market for bituminous coal: Everyone concedes that the demand is excellent, and the majority of producers say that it is just double their capacity to supply. As usual, the transportation facilities are to blame for the inability to meet the demand. The Baltimore & Ohio and Pennsylvania railroads are giving very poor transport to the coal cars; and, of course, during last week the Columbus celebration in New York interfered seriously with freight transport of all kinds. The shipping facilities are also poor, as the vessels have become tired of waiting for car deliveries of coal and the low freights due to the accumulation of vessels at ports. The vessels that are to be had therefore at all ports are enabled to ask for a much higher rate, and as the coal companies are determined to deliver to their customers at all cost before their customers stock shall have vanished, there is plenty of chartering being done at the advanced rates. The rates from Philadelphia to Boston, Salem and Portland are 75@80c.; to Portsmouth 85c., and to Sound ports 70c. From Baltimore, Newport News and Norfolk the rates are to Boston, Salem and Portland 85c.; to Portsmouth 87½c., and to Sound ports 80c.

Two weeks ago we mentioned the rumors which are afloat to the effect that a soft coal "combine" is being discussed at present. This report still exhibits vitality. Last Saturday a Philadelphia paper published a long account, in prominent type, of a scheme of consolidation which is alleged to be ready for being carried out. It is probable that the writer of this article had obtained access to the papers relating to the conference of the Seaboard Steam Coal Association, held in March last. It is true that propositions have been made, and are still being made, for a consolidation of the soft coal interests. Such a step is highly desirable, in the opinion of the producers, owing to the cutting of rates to such a ruinous extent, and if any feasible scheme could be found without doubt the producers would be only too glad to avail themselves of it. The price of bituminous is so low, and the circumstances under which the companies work are so disadvantageous at present, that unless something is done in the near future to put a stop to the miners cutting of prices, many of the companies will go under before many years are over. So far no feasible scheme has been discovered and it is doubtful if such a scheme could be found, for the varieties of coal are so great and the supply of coal at all points is so plentiful that a satisfactory working combine seems impossible. The scheme put forward by the Philadelphia paper is on the face of it impossible, as the first item is the formation of a large company with a stock of $20,000,000. Now the coal companies all complain of shortness of capital and it is hardly likely that they would subscribe what capital they have for the privilege of having their business managed by some one else. Something better than this will have to be proposed before the coal firms will even discuss the matter.

Judge Dennis, of the Baltimore City Circuit Court, on the 17th inst., took up the bill for an injunction brought by Alexander Shaw and others against the West Virginia Central Railroad Company, seeking to restrain the company from disposing of the permanent lease it has on the Piedmont and Cumberland Railroad. The case will last the entire week, and is the first of a series of fights led by John K. Cowan and Alexander Shaw, supposed to be representing the Baltimore & Ohio Railroad and its interests, against the somewhat successful encroachments of the West Virginia Central Railroad in the former's soft coal territory. Alexander Shaw, the plaintiff in this case, is the owner of about one-fifth the stock of the West Virginia Central & Pittsburgh Railway Company. He complains that he has been systematically robbed during a series of years by three prominent men, Stephen B. Elkins, Henry G. Davis and Thomas B. Davis, who own a majority of the company's stock and manage its affairs. He charges that the West Virginia Central & Pittsburgh Railway Company was started as an enterprise of small proportions, but of assured profits, if kept within its proper limits. It fell into the hands of Messrs. Elkins and Davis, and they have so perverted it that it is now a top-heavy concern, and the plaintiff says he has good reason to fear the ultimate bankruptcy of the concern unless the courts will stop these proceedings. The most valuable property of the company, and, the plaintiff claims, the only thing of value, is a small bed of excellent coal, amounting originally to between 700 and 800 acres. It is admitted that the sale of this coal has been the only side of the enterprise that has made profits.

Boston. Oct. 20.

(From our Special Correspondent.)

Although commission men in this market claim to be doing a big business, it is well known that they are not. They cannot very well sell coal, as the dealers have no place to put it. Dealers generally are taking on as much as they can, but that is not much. There are reports in this market of individual operators underselling the combination. The latter holds firm to its present.

We quote, f. o. b., prices at New York: Stove, $4.75; egg, $4.50; free broken, $4.10; chestnut, $4.65; Lykens Valley (at Philadelphia): Broken, $4.85; egg, $5.45; stove, $6; chestnut, $5.

In soft coal there is a good business doing. Dealers are taking as much as they can comfortably handle. Prices here are unchanged. George's Creek coal on cars here is worth $3.40@$3.45 per ton, and Clearfield $3.10@$3.15 per ton.

The demand for tonnage is somewhat better than it was as there is more coal moving. Prices are firmer than last reported but not higher.

We quote: From New York to Boston 50@55c.; from Philadelphia 60@70c.; from Bath 75@80c.. to Providence 60@65c.; from Baltimore 75@80c.; from Newport News, 75@80c.; to Sound Points 60@70c.

The yards are all very busy. Consumers are now laying in a good stock for the Winter. The schedule prices here are strictly adhered to.

We quote: Stove, $6.25; nut, $6.25; egg, $6; furnace, $5.75; Franklin, $7.50; Lehigh egg, $6.25; Lehigh furnace, $6.25.

The receipts of coal at the port of Boston for the week ending October 15th were 36,424 tons of anthracite and 2,296 tons of bituminous, against 42,505 tons of anthracite and 17,175 tons of bituminous for the eorresponding week last year. The total receipts thus far this year have been 1,676,552 tons of anthracite and 658,021 tons of bituminous, against 1,602,690 tons of anthracite and 821,592 tons of bituminous last year.

Buffalo. Oct. 20.

(From our Special Correspondent.)

The weather for several days has been mild, and hut little artificial heat has been required for family use; consequently orders have not been large. Other consumption has been good. Prices unchanged; the feeling among dealers seems to lead to the conclusion that quotations will not be advanced on November 1st, and probably higher rates than those now prevailing will not rule this year.

Bituminous coal firm and with upward tendency, partly in consequence of limited supply through lack of transportation facilities. Demand good to supply propellers, tugs and the ever-increasing manufacturing concerns, to which should be added family trade for open grates, etc., caused by the high price of anthracite.

Lake freights on coal have advanced to Chicago, Milwaukee and Racine, 5@10c. per net ton, with a firm feeling among vessel men. There is a good demand for freight carriers and there is no trouble in obtaining the rates asked.

Thus far this season 2,336,000 net tons of coal have passed through the Sault Ste. Marie canal, nearly double the tonnage of 1889. This year will show the largest coal movement by this route ever known.

The movement of coal by lake westward from October 12th to 18th, both days inclusive, aggregated 95,495 net tons, distributed about as follows: 42,525 to Chicago, 27,700 to Milwaukee, 7,400 to Duluth, 2,000 to Toledo, 8,400 to Superior, 1,500 to Gladstone, 930 to Racine, 200 to Bay City, 900 to Detroit, 1,200 to Lake Linden, 300 to Saginaw, 1,800 to Ashland, 560 to Sheboygan, 400 to Port Huron, 500 to Windsor, and 80 to other places. The rates of freight were 70@75c. to Chicago, 65@70c. to Milwaukee, 75c. to Racine and Sheboygan, 50c. to Lake Linden, 45c. to Gladstone, 40c. to Saginaw and Bay City, 25c. to Duluth, Superior, Ashland, Windsor, Toledo and Detroit. Closing firm.

The canal movement to and from Buffalo of coal for second week in October was as follows: Receipts 4,842 net tons, and shipments 466 net tons.

The managers of the National Gas Fuel Company have discontinued supplying all large consumers of their gas as the demand for family use has increased so rapidly that it is not as profitable to serve manufacturers as private families.

Chicago. Oct 21.

(From our Special Correspondent.)

The present weather is anything but exhilarating to the coal trade and anthracite in all of its branches is quiet. Some months ago we called the attention of the public to the fact that owing to the large amount of coal sold early in the season, we believed the prospects for a dull trade in October were good. The continued mild weather and these early deliveries in March, April, May and June have brought about the condition we foreshadowed at that time. A month ago one of the largest dealers in Chicago told us that up to that date he had delivered more anthracite coal from his yards than up to the same date at any time in fifteen years' experience. He now finds business very dull, and his trade for October, 1892, is much lighter than for any corresponding month during the same number of years. We think that if the truth was told by all the shippers and dealers, they would be obliged to confess to a corresponding state of affairs.

Though we hear of one large dealer here who claims to be 5,000 tons behind with his deliveries, that is to say, he has sold over 5,000 tons for immediate delivery, more than he has been able to deliver. But as the same dealer has the reputation of doing more monkey work with prices than usually falls to the lot of dealers, the condition of his business is not a matter of surprise. The fact of the matter is that present prices of hard coal are too remnnerative for all shippers to be virtuous. Car coal from dock for Western shipments is unchanged, hut all-rail coal according to the Philadelphia and Reading people here is $6.35, though other shippers claim to have no notice of any advance. This split will have the effect of stimulating the movement of lake coal until November 1st, when it is probable that prices will be even up. Retail trade is also quiet, though with the prospective advance on the 1st proximo it should become active before that date. Much inconvenience (putting it mildly) is occasioned by the scarcity of box cars.

Bituminous coal is active, cars scarce and prices satisfactory; and, while we have no marked advances to report, slight premiums have been paid on "Circular" where prompt shipments have been guaranteed. Mine operators are obtaining full quotations on any surplus coal they have to offer to the general dealers. There is still much annoyance and trouble caused by the confessed inability of railroads to move supplies of coal, and as the days grow shorter the inconvenience becomes more pronounced. Shipments of Hocking Valley coal are being restricted by the strike of the switchmen at Columbus, O. The steady demand for the better grades of bituminous has drawn sharply from stocks on docks on the Lower, as well as the Upper lakes, and some of the former are taxed to their full capacity. Indiana and Wilmington, Ill., block coal are in excellent demand, and most of the mines are badly behind on orders. Miners and labor around mines are in good demand, and in some districts there is an actual scarcity, so much so as to affect the tonnage mined.

Coke is in good demand, and in some cases supply is insufficient to take care of orders promptly; as a consequence prices are well maintained on foundry grades of standard makes. Crushed domestic is steadily gaining.

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

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

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, $3.40; Hocking Valley, $3.20; Youghiogheny, $3.25; Illinois block, $1.90@2; Brazil block, $2.50@$2.60.

Pittsburg. Oct. 20.

(From our Special Correspondent.)

Coal.—The market continues firm with a good local demand. The natural gas companies have announced another increase, to go into effect on the 1st of November. This will further increase the demand for coal in this vicinity. The Monongahela strike is still on. The prevailing opinion is that work will soon be resumed at three cents for mining. It is said, on the authority of a prominent coal operator of the fourth pool, that all the operators will join the combine by November 1st. It is claimed that only one-fourth of a cent. on a bushel profit is made at the present rate, and that the miners will have to agree to the half-cent reduction. This combination will also put an end to the knifing which has been going on among the river operators themselves. Will open new mines—the New York & Cleveland Gas Coal Company, whose most extensive mines are near Turtle Creek, are opening up a half dozen new mines in Lyons Run, between Turtle Creek and Murrysville. Tracks are being laid from Turtle Creek to the new field, which is considered a very valuable one.

Connellsville Coke.—The coke revival is handicapped by shortage of cars and drought. The former was not unexpected, but the latter is a more annoying feature to those who have suffered by it. Some of the works were paralyzed last week and production dropped over 8,000 tons in consequence. Shipments increased somewhat and considerable stock was worked off the yards. Production this year promises to reach 6,000,000 tons. The shipments from January to October 1st aggregated 256,188 cars, containing 4,641,541 tons. If the present brisk trade continues the year's output will exceed that of any other year since 1890, when it reached 6,221,518 tons. Last week the McClure Coke Company fired up 143 idle ovens. The Frick Coke Company fired up 474 idle ovens. Most of the plants in the regions are making five and six days. The operations and output of the region show 12,737 ovens in blast and 4,514 idle, with a total estimated production of 129,780 tons, distributed as follows: To Pittsburg, 1,758 cars; to points east of Pittsburg, 1,325 cars; points west of Pittsburg, 3,406 cars; total, 6,489 cars, which shows a gain of 146 cars in Western shipments, 15 in Eastern and 43 in Pittsburg shipments. Prices are unchanged.

CHEMICALS AND MINERALS.

NEW YORK, Thursday Evening, Oct. 20.

Heavy Chemicals.—In this market nothing of interest has occurred, and there is nothing new to report. This was to be expected. In these days of agents and fixed prices it is seldom that any news transpires. During the past week the market has been quiet and devoid of significant features. Caustic soda is as last reported. Carbonated soda ash has been rather scarce, but no sales of importance have taken place. A fair inquiry was manifested for alkali. The spot demand for bleaching powder continues good, and a very fair business was done during the week. Quotations this week are as follows: Caustic soda, 60%, 3·17½@3·27½c.; 70%, 2·95@3·12½c.; 74%, 2·97½@3·15c.; 76%, 3·12½@3·25c.; 77%, 3·12½@3·25c. Carbonated soda ash, 48%, 1·57½@1·60c.; 58%, 1·47½@1·52½c. Alkali, 48%, 1·60@1·65c.; 58%, 1·55@1·65c. Sal soda, English, 1·07½@1·15c; American, 1·05@1·10c.; bleaching powder, 3@3¼c.

Acids.—The good demand for acids reported in our last week's issue continue unabated. Business has been active in the various acids, notably in sulphuric and prices have been well maintained. Our quotations are: Acid per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, $1 60 @$2, according to quality; muriatic, 18°, $1@$1.25; 20°, 90c.@$1.10; 22°, $1.25@$1.50; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 85c.@$1.10; mixed acids, according to mixture; oxalic, $7.25@$7.75. Blue vitriol is quoted all the way from $3.50@$3.75; Glycerine for nitroglycerine, 11¼@12½c., according to quality and quantity. Blue vitrol.—There is a fair trade at prices ranging from 3¼c.@3⅝c.

Brimstone.—Owing to an accumulation of stocks, the absence of orders and low freights late European cables report a lower market. In this city the market has been rather quiet. Quotations for November—December shipments were $22 50@$23 for best unmixed seconds and 75c. for thirds. Arrivals are quoted at $24 and $23 for seconds and thirds, respectively.

Fertilizers.—The market for fertilizers is quiet but firm. The ammoniates are slightly higher and quite firm.

The entire market generally shows little or no change from last week. We quote this week: Sulphate of ammonia, $2.90@$2.95 for bone goods and $2.95@$3 for gas liquor. Dried blood, $2.10@$2.15 per unit for high grade and $2@$2.05 for low grade; acidulated fish scrap, $13.50 f. o. b. factory; dried scrap, $24@$24.50. Azotine, $2.05@$2.10. Tankage, $19@$23, according to grade. Bone tankage, $22.50@$23.50; bone meal, $23.50@$25.50.

Double manure salts are unchanged. The price has been fixed by the syndicate's agents, and has not changed during the year. Quotations are as follows: $1.13½ cwt., basis 48@53%, in 50-ton lots, on foreign weights and analysis. High grade sulphate, $2.13 cwt., basis 90% foreign weights and tests.

Phosphates.—Phosphate rock, Florida, 60@62%, is quoted from Punta Gorda at $4.50 per ton of 2,240 lbs. Charleston rock is quoted at $4.75@$5 f. o. b., Charleston.

Mr. Paul C. Treneolm, the well known phosphate broker of Charleston, S. C., sends us the following interesting statistics, showing shipments of phosphate rock from that port during September, 1890, 1891 and 1892.

	1890.		1891.		1892.	
	Crude.	Gro'nd	Crude.	Gro'nd	Crude.	Gro'nd
Domestic..	17,111	Nil.	21,571	1,588	13,168	200
Foreign...	1,200	Nil.	Nil.	Nil.	175	Nil.
Grand tot'l	18,311	Nil.	21,571	1.588	13,343	200

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

Muriate of Potash.—There is no change to report of this article. Arrivals during the week amounted to 925 tons. New sales were 100 tons, future shipments. Prices are: For 50 tons or over, New York or Boston, $1.81½; Philadelphia or Baltimore, $1.84; Southern ports, $1.86½.

Nitrate of Soda.—The nitrate market is strong, and shows an advancing tendency. Quotations this week are: Ex-store, $2.05@$2.10; ex-ship, $2.05; to arrive (September sailings), $2.05. The European market is reported higher.

Liverpool. Oct. 12.

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

On the spot, trade in heavy chemicals generally is dull, while at the same time prices keep very steady with the exception of bleaching powder, which article keeps moving in a downward direction.

Soda Ash is scarce, per Leblanc makes, and quotations are nominal, as follows:

Caustic ash, 48%, £5 6s. 3d. per ton and upward; 57–58%, £6 4s. 6d. per ton and upward; Carb. ash, 48%, £5 9s.9d. per ton and upward, 55%, £6 12s. 9d. and upward; Ammonia ash, 58%, £6 7s. 6d.; net cash. The "Union" declines to give quotations for 1893 delivery, but invites bids.

Soda crystals are selling to a moderate extent at £3 5s.@£3 7s. 6d. per ton, less 5%.

Caustic Soda is difficult to move and only a hand to mouth business is passing. Quotations for prompt delivery, and to end of 1892, are unchanged as follows: 60%, £9 2s. 6d. per ton; 70%, £10 5s. per ton; 74%, £11 5s. per ton; 76%, £12 5s.@£12 10s. per ton, net cash.

For parcels under 10 tons, 5s. per ton extra is charged. The "Union" will not sell on this market price except to United States or Canada. For contracts extending over all 1893, 10s. under spot quotations would be accepted.

Bleaching powder is quite neglected and £8 10s.@£8 15s. per ton net cash represents nominal quotations for hardwood casks, prompt delivery, while reseliers would probably shade the lower figure. There is so little doing, however, that it is difficult to test values. Sales to United States and Canada are barred by the "Union." For delivery over all 1893, £7 15s.@£8 per ton net cash, is about range for hardwood casks.

Chlorate of potash is rather stronger, owing to scarcity. There is nothing offering for early delivery, and 7¼d. less 5% quoted for October.

Business is reported for November at 7⅛d. while for November and December holders ask 7d. For all 1893 6½d. is the quotation, and 6⅝d. for first six months of next year.

Bicarb. soda is in fair demand, and firm at £6 15s. per ton less 2½% per one cwt. kegs, with usual allowances for large packages.

Sulphate of Ammonia.—With large supplies the tone is not quite so firm, although quotations are nominally unchanged at £10 2s. 6d. to £10 5s. per ton for good grey 24%, and about £10 7s. 6d. per ton for 25%, both in double bags less 2½% f. o. b. Liverpool.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	Oct. 15. H.	Oct. 15. L.	Oct. 17. H.	Oct. 17. L.	Oct. 18. H.	Oct. 18. L.	Oct. 19. H.	Oct. 19. L.	Oct. 20. H.	Oct. 20. L.	Oct. 21.‖ H.	Oct. 21.‖ L.	Sales.
Adams, Colo.													
Alice, Mont.	.55		.65	.60									1,100
Amador, Cal.													
Atlantic, Mich.													
Belcher, Nev.	4.60												50
Belle Isle, Nev.													
Bodie Cons., Cal.	.85												200
Bos. & Mont., Mont													
Breece, Colo.													
Bulwer, Cal.					.35								500
Caledonia, S. Dak.													
Catalpa, Colo.													
Chrysolite, Colo.													
Colorado Central, Colo.													
Commonwealth, Nev.													
Comstock T. bonds, Nev.	.19							.17					2,000
" scrip., Nev.													
Cons. Cal. & Va., Nev.	4.10				3.60			3.25					356
Crown Point, Nev.			1.30										100
Deadwood, Dak.													
East Sierra Nev.													
Eureka, Cons., Nev.													
Father de Smet, Dak													
Freeland, Colo.													
Gould & Curry, Nev.	1.50		1.25					1.10					400
Grand Prize, Nev													
Hale & Norcross, Nev.					1.65			1.55					250
Homestake, Dak.													
Horn Silver, Utah.			3.90										300
Independence, Nev.													
Iron Hill, Dak													
Iron Silver, Colo													
Leadville Cons., Colo.													
Little Chief, Colo.	.25				25								1,000
Martin White, Nev													
Mono							.36	.35					860
Mt. Diablo, Nev.													
Navajo, Nev.													
N. Belle Isle, Nev.													
Ontario, Utah.	40.50												120
Ophir, Nev.	3.10		2.85					2.50					250
Overman, Nev.													
Plymouth, Cal.			.75	.70	.85	.80	.90						380
Quicksilver, Pref., Cal.													
" Com., Cal.													
Quincy, Mich.													
Robinson Cons., Colo.													
Savage, Nev.													
Sierra Nevada, Nev.													
Silver Cord, Colo.													
Silver King, Ariz.													
Silver Min. of L. Valley													
Small Hopes, Colo.													
Standard Cons., Cal.													
Yellow Jacket, Nev.	1.55						1.15		1.55				260

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	Oct. 15. H.	Oct. 15. L.	Oct. 17. H.	Oct. 17. L.	Oct. 18. H.	Oct. 18. L.	Oct. 19. H.	Oct. 19. L.	Oct. 20. H.	Oct. 20. L.	Oct. 21.‖ H.	Oct. 21.‖ L.	Sales.
Alpha., Nev.													
Alta, Nev									1.35				100
American Flag, Colo.													
Andes, Cal.													
Astoria, Cal.													
Augusta, Ga.													
" bonds.													
Barcelona, Nev													
Belmont, Cal.													
Best & Belcher, Nev.	2.20		2.15						1.70				300
Bonanza King, Cal.													
Brunswick, Cal.	‡.09	‡.08	.10		.10								2,800
Bullion, Nev.			80				.80						190
Butte & Bost., Mont.													
Castle Creek, Idaho.													
Challar.	1.15				.90								400
Comstock T., Nev.					.13				.12				700
Con. Imperial, Nev.													
Con. Pacific, Cal.													
Crescent, Colo.													
Del Monte, Nev.													
El Cristo, Rep. of Col.													
Emmett, Colo													
Exchequer, Nev.													
Hollywood, Cal.													
Julia, Nev	.16												200
Justice, Nev													
King & Pembroke, Ont.													
Lacrosse, Colo.													
Lee Basin, Colo.													
Mexican, Nev.	1.85		1.80										220
Middle Bar, Cal.													
Monitor, Colo.													
Mutual S. & M. Co., Wash.													
Nevada Queen, Nev.													
N. Standard, Cal.													
N. Commonwealth, Nev.													
Occidental, Nev.													
Oriental & Miller, Nev.													
Phœnix Lead, Colo.													
Phœnix of Ariz.			.56	‡.50	55	54	.55	.50					5,600
Potosi, Nev.									1.05				200
Rappahannock, Va.													
S. Sebastian, S. Sal.													
Santa Fe, N. M.													
Scorpion, Nev.													
Seg. Belcher, Nev.													
Shoshone, Idaho.													
Silver Queen, Ariz													
Sullivan Con., Dak.													
Sutro Tunnel, Nev.													
Syndicate, Cal.													
Tornado Con., Nev.													
Union Cons., Nev.													
Utah, Nev.													

*Ex-divide nd. †Dealt at In New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 8,060. Non-dividend shares sold, 10,710.
Total shares sold, 18,770 ‖Holiday.

BOSTON MINING STOCK QUOTATIONS.

Name of Company.	Oct. 14.	Oct. 15.	Oct. 17.	Oct. 18.	Oct. 19.	Oct. 20.	Sales.
Atlantic, Mich.		10.75	11.25	11.13 11.25	10 75		275
Bodie, Cal.							
Bonanza Development.	.28						100
Bost. & Mont., Mont.	35.00	33 25	36.00	35.50 37.00	36.00	36.75 35.75	36.50 35.50	9,160
Breece, Colo.							
Calumet & Hecla, Mich.	292	290		294			28
Catalpa, Colo.							
Central, Mich.							
Cœur d'Alene, Id							
Con. Cal. & Va., Nev.							
Dunkin, Colo							
Eureka, Nev.							
Franklin, Mich.		14 88	14 63	14.88	14.75	14.25 14.50	455
Honorine, Utah.							
Horn Silver, Utah.							
Kearsarge, Mich.	11.63	11.50	12.00	11.50 12.00	12.00	12.25 11 75	1,325
Lake Superior, Iron.							
Little Pittsburg, Colo.							
Minnesota Iron, Minn.							
Napa, Cal.			5.63	5.75 5.63			250
Ontario, Utah.							
Osceola, Mich.	34.75	34.00	36.00	34.00 36.00	35.25	35.75 35.00	36.00 35.13	4,080
Quincy, Mich							
Ridge, Mich.							
Sierra Nevada, Nev.							
Silver King, Ariz							
Stormont, Utah.							
Tamarack, Mich.		160		160			85
Tecumseh, Mich.							

Name of Company.	Oct. 14.	Oct. 15.	Oct. 17.	Oct. 18.	Oct. 19.	Oct. 20.	Sale
Allouez, Mich.	1.00			1 25	1.00		255
Arnold, Mich.	1.50						200
Aztec, Mich							
Brunswick, Cal.							
Butte & Boston, Mont.		9 75	10.00	9 88 10.00	9.75	9.88	625
Centennial, Mich.	8.00	9 00	9 50	9.00 9.50	8.50	9.25 9.00	1,790
Colchis, N. Mex.							
Copper Falls, Mich.							
Crescent, Colo.							
Dana, Mich.							
Don Enrique, Mex.							
Geyser, Colo.							
Hanover, Mich.							
Humboldt, Mich.							
Hungarian, Mich.							
Huron, Mich.							
Mesnard, Mich.			.50				100
National, Mich.							
Native, Mich.							
Orientai & M., Nev.							
Phœnix, Ariz							
Pontiac, Mich.							
Rappahannock, Va.							
Santa Fe, N. Mex.							
Shoshone, Idaho.							
South Side, Mich.							
Tamarack, Jr, Mich.	19 00	19 00			23.00	22 50	298
Washington, Mich.							
Wolverine, Mich.	1.50	1.50	2.00		2 00		90

Dividend shares sold, 15,758. Non-dividend shares sold, 4,168. Total shares sold, 19,926.

DIVIDEND-PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied.	Assessments. Date and amount of last	Dividends. Total paid.	Dividends. Date & amount of last.
1	Adams, s. L. G.	Colo.	$1,500,000	150,000	$10	*		$637,500 Jan. 1892 .05
2	Alaska-Treadwell, g.	Al'ska	5,000,000	200,000	25			1,375,000 July 1892 .37½
3	Alice, s.	Mont.	10,000,000	400,000	25	*		975,000 Nov. 1891 .06¼
4	Alma & Nel Wood., g	Idaho	900,000	90,000	10	*		60,000 Jan. 1889 .50
5	Amador, G.	Cal.	1,250,000	250,000	5	*		31,250 Aug. 1890 .12½
6	American, G.	Colo.	3,000,000	300,000	10	*		225,000 Mar. 1892 .05
7	American Belle, s. G. C	Colo.	2,000,000	400,000		*		50,000 April 1891 .12½
8	Americ'n & Nettie, G. &	Colo.		300,000				75,000 Mar. 1892 .05
9	Atlantic, C.	Mich.	1,000,000	40,000	25	280,000 April 1875	$1.00	900,000 Feb. 1891 1.00
10	Argenta, s.	Nev.	10,000,000	100,000	100	335,000 July. 1889	.10	4,000 Feb. 1880 .20
11	Argyle, G.	Colo.	1,000,000	1,000,000	1	*		20,000 Mar. 1892 01
12	Aspen Mg. & S., s. L.	Colo.	2,000,000	200,000	10	*		76,000 Sept. 1892 .10
13	Aurora, I.	Mich.	2,500,000	100,000	25			450,000 June 1892 1.00
14	Badger, s	Ont.	250,000	50,000	5			37,500 Mar. 1890 .25
15	Bald Butte	Mont.	250,000	250,000	1			72,500 Mar. 1892 .03
16	Bates Hunter, s. g.	Colo.	1,000,000	1,000,000	1			Dec. 1891 .03¾
17	Belle Isle, s.	Nev.	10,000,000	100,000	100	220 00 Aug. 1892	.10	800,000 Dec. 1879 .25
18	Belcher, s. G.	Nev.	10,400,000	104,000	100	3,16 00 May 1892	.25	15,397,000 April 1876 1.00
19	Bellevue, Idaho, s. L.	Idaho	1,250,000	125,000	10	1 000 Dec. 1889	.25	200,000 Jan. 1890 .10
20	Best Friend	Colo.	1,000,000	1,000,000	1			90,000 Feb. 1892 .01
21	Bi-Metallic, s. G.	Mont.	5,000,000	200,000	25			1,800,000 Nov. 1891 .35
22	Bodie Con., G. I.	Cal.	10,000,000	100,000	100	0,000 June 1890	.25	1,602,572 April 1885 .50
23	Boston & Mont., G.	Mont.	2,500,000	250,000	10	*		520,000 June 1886 .15
24	Boston & Mont., C. &	Mont.	3,125,000	125,000	25	*		2,075,000 Nov. 1891 1.00
25	Brooklyn Lead, L. &	Utah.	500,000	50,000	10			127,000 July. 1887 05
26	Bulwer, G.	Cal.	10,000,000	100,000	10	30,000 Aug. 1889	.25	195,000 Oct. 1892 .05
27	Bunker Hill & S. & L.	Idaho	3,000,000	300,000	10			150,000 Oct. 1888 .06¾
28	Caledonia, G.	Dak.	10,000,000	100,000	100	505,000 May. 1885	.15	192,000 Oct. 1890 .08
29	Calliope, s.	Colo.	1,000,000	1,000,000				140,000 Jan. 1891 .00¼
30	Calumet & Hecla C	Mich.	2,500,000	100,000	25	1,200,000		38,350,000 Sept. 1892 5 00
31	Centen'l-Eureka, s. L.	Utah.	1,500,000	30,000	50			562,500 April 1892 .50
32	Central, C.	Mich.	500,000	20,000	25	100,000 Oct. 1861	.65	1,970,000 Feb. 1891 1.00
33	Champion, G	Cal.	340,000	34,000	10			104,700 Sept. 1892 .10
34	Chrysolite, s. L.	Colo.	10,000,000	200,000	50	*		1,650,000 Dec. 1884 .25
35	Clay County, G.	Colo.	200,000	200,000	1	*		56,000 Nov. 1891 .02
36	Clinton Con, g	Cal.	5,000,000	100,000	5			90,000 Nov. 1891 .10
37	Cœur D'Alene, s. L.	Idaho	5,000,000	500,000	10			310,000 Nov. 1891 .02
38	Colorado Central, s. L.	Colo.	2,750,000	275,000	10	*		488,750 Oct. 1892 .05
39	Commonwealth, s.	Nev.	10,000,000	100,000	100	193,000 Sept. 1892	.10	30,000 Nov. 1860 .20
40	Confidence, s. L.	Nev.	2,496,000	24,960	100	1,589,550 Aug. 1892	.50	199,680 April 1889 1.00
41	Cons. Cal. & Va., s. G	Nev.	21,600,000	216,000	100	108,000 Jan. 1885	.20	3,682,800 Aug. 1891 .50
42	Contention, s.	Ariz.	12,500,000	250,000	50			‡2,637,500 Aug. 1892 .20
43	Cook's Peak, s	N. M.	2,000,000	200,000	10			109,532 Oct. 1892 .05
44	Cop. Queen Con., C.	Ariz.	1,400,000	140,000	10			1,085,000 Aug. 1892 .25
45	Coptis	Nev.	10,000,000	100,000	100			67,000 July. 1892 .12
46	Cortez, s.	Nev.	1,500,000	500,000	05	*		687,000 Mar. 1892 .50
47	Crescent, s. L. G.	Utah.	15,000,000	600,000	25	*		228,000 Oct. 1888 .03
48	Crown Point, G. & s.	Nev.	10,000,000	100,000	100	2,700,000 Sept. 1892	.25	11,898,000 Jan. 1875 2.00
49	Cumberland, L. & s.	Mont.	5,000,000	500,000	10	*		15,000 Nov. 1889 .08
50	Daly, s. L.	Utah.	3,000,000	150,000	20			2,287,500 Oct. 1892 .25
51	Deer Creek, s. G.	Idaho	1,000,000	200,000	5	*		20,000 June 1889 .05
52	Deadwood-Terra, G.	Dak.	5,000,000	200,000	25	*		1,140,000 Sept 1892 .25
53	DeLamar, s. G.	Idaho	2,000,000	400,000	5			416,000 July. 1892 .25
54	Derbec B. Grav., G.	Cal.	10,000,000	100,000	100	100,000 Sept. 1892	.10	260,000 Aug. 1891 .10

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.	Capital Stock.	Shares. No.	Shares. Par	Assessments. Total levied	Assessments. Date and amt of last.
1	Alliance, s. G.	Utah.	$100,000	100,000	$1	$120,000 Feb. 1892 .20
2	Allouez, C.	Mich.	2,000,000	80,000	25	737,000 Jan. 1892 .70
3	Alpha Con., G. & s.	Nev.	3,000,000	30,000	100	269,000 Sept. 1892 .10
4	Alta, s.	Nev.	10,080,000	100,800	100	3,369,880 Jan. 1892 .10
5	American, C.	Idaho	5,000,000	5,000,000	1	
6	American Flag, s.	Colo.	1,250,000	125,000	10	300,000 June 1887
7	Amity, s.	Colo.	250,000	250,000	1	
8	Anchor s. L. G.	Utah.	3,000,000	150,000	20	410,000 June 1890 .20
9	Anglo-Montana, Lt.	Mont.	600,000	120,000	5	
10	Appalachian, g.	N. C	1,750,000	1,400,000	125	
11	Arizona, C.	Ariz	3,575,000	160,000	20	
12	Astoria, G.	Cal.	200,000	100,000	2	
13	Atlanta, g. s	Idaho	3,250,000	650,000	5	
14	Barcelona, G.	Nev	5,000,000	200,000	25	*
15	Bear Creek	Idaho	100,000	20,000	5	*
16	Belmont, G.	Cal.	500,000	500,000		*
17	Belmont, s.	Nev.	5,000,000	50,000	100	735,000 April 1886 .10
18	Best & Belcher, s. G.	Nev.	10,080,000	100,800	100	2,405,275 Aug. 1892 .25
19	Black Oak, G.	Cal.	3,000,000	300,000	10	*
20	Boston Con., G.	Cal.	10,000,000	100,000	100	170,000 Nov. 1886 .25
21	Brownlow, G.	Colo.	250,000	250,000	1	
22	Brunswick, G.	Cal.	2,000,000	400,000	5	
23	Buckeye, s. L.	Mont.	1,000,000	500,000	2	
24	Bullion, s. G.	Nev.	10,000,000	100,000	100	2,890,000 Aug 1892 .25
25	Burlington, g. s.	Cal	10,000,000	100,000	100	
26	Butte & Boston, C. s.	Mont.	3,000,000	300,000		
27	Butte Queen, G.	Cal.	1,000,000	100,000	10	6,000 Jan. 1892 .01
28	Calaveras Con., g.	Cal.	500,000	500,000	1	
29	Calaveras Con., g.	Cal.	800,000	160 000	5	
30	California, G.	Cal.	1,000,000	100,000	10	9,000 Mar. 1892 .03
31	California Con. I. Q.	Cal.	2,250,000	450,000	5	
32	Camille, g.	Ga	1,500,000	150,000	10	
33	Carisa, G.	Wy.	500,000	100,000		*
34	Carupano, G. & L. C.	Ven.	200,000	100,000	2	*
35	Cashier, G. &	Colo.	500,000	250,000	2	*
36	Challenge Con., g. &	Nev.	5,000,000	50,000	100	
37	Cherokee, G.	Cal.	1,500,000	150,000	10	
38	Chollar, s. G.	Nev	11,200,000	112,000	100	1,820 00 May. 1892 .50
39	Cleveland, T.	Dak.	1,000,000	500,000	2	*
40	Colchis, s. G.	N. M.	500,000	170,000	10	*
41	Colorado, s	Colo.	1,625,000	325,000	5	
42	Comstock, s	Utah.	1,250,000	250,000	1	
43	Comstock Tun.	Nev	11,000,000	100,000	100	35,000 Mar. 1887 .15
44	Con. Imperial, G. &	Nev.	5,000,000	50,000	100	2,062,500 Jan. 1892 .25
45	Con. New York, s. G.	Nev.	5,000,000	100,000	50	110,000 Mar. 1892 .10
46	Con. Pacific, G.	Cal	6,000,000	60,000	100	198,000 June 1891 .10
47	Con. Silver, s.	Mo.	2,500,000	250,000	10	
48	Cordova Union, g.	Cal.	1,000,000	200,000	5	*
49	Crescent, s. L.	Colo.	3,000,000	300,000	10	*
50	Crocker, s.	Ariz.	10,000,000	100,000	100	165,000 Aug. 1892 .15
51	Crowell, G.	N. C.	500,000	500,000	1	
52	Dahlonega, G.	Ga.	250,000	250,000	1	*
53	Dandy, s.	Colo.	5,000,000	500,000	10	
54	Decatur, s	Colo.	1,500,000	300,000	5	*

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total Levied.	Assessments. Date and amount of last	Dividends. Total paid.	Dividends. Date & amount of last.
55	Dexter, g. s	Nev.	1,000,000	100,000	10			80,00	Aug.. 1892 .25
56	Dunkin, s. L	Colo..	5,000,000	200,000	25	*		890.00	Oct.. 1889 .05
57	Elkhorn, s. L	Mont.	1,000,000	200,000	5	*		846.00	Sept. 1892 .62½
58	Enterprise, s	Colo..	100,000	10,000	10	*		600,000	Oct.. 1892 .10
59	Eureka Con., s. L. G.	Nev...	1,000,000	50,000	100	550,000	June 1889 .50	5,017,500	Jan 1892 .25
60	Evening Star, s. L	Colo..	500,000	50,000	10	*		1,450,000	Dec. 1889 .2
61	Father de Smet, G	Dak..	10,000,000	100,000	100	200,000	Nov.. 1878 1.00	1,125,000	Dec.. 1885 .20
62	Franklin, C	Mich..	1,000,000	40,000	25	220,000	June 1871	1,100,00	July 1892 2.00
63	Freeland, s. G	Colo..	5,000,000	200,000	25	*		190,000	July.. 1886 .10
64	Garfield Lt., G. S.	Nev ..	500.000	100,000	5			90.000	April 1888 .12½
65	Glengarry	Mont.	1,000,000	100.000	10			10.000	June 1891 .25
66	Gold Rock	Colo..	500,000	500.000	1				Dec.. 1891 .01
67	Golden Reward	S.Dak	1,250,000	250,000	5			45,000	Aug.. 1892 .02
68	Gould & Curry, s. G	Nev...	10,800,000	108,000	100	4,591,200	June 1892 .25	3,826,800	Oct.. 1870 10.00
69	Grand Prize, s	Nev...	10,000,000	100,000	100	785,000	Jan.. 1890 .30	495.000	Mar. 1884 .25
70	Granite, s. L	Idaho	500,000	500,000	1	*		83,400	Nov.. 1890 .02
71	Granite Mountain, s.	Mont.	10,000,000	400,000	25			12,040,000	June. 1892 .20
72	Great Western, L. G.	Cal	5,000,000	50,000	100			332,361	July.. 1892 .25
73	Green Mountain, G	Cal..	1,250,000	125,000	10	*		212.000	Nov.. 1881 .07½
74	Hale & Norcross, G. S.	Nev...	11,200,000	112,000	100	5,534,800	Aug.. 1892 .50	1,822,000	Aug. 1888 .50
75	Hecla Con., S. G. L. C.	Mont.	1,500,000	90,000	50			1,860,000	Aug 1892 .50
76	Hel'a Mg.& Red,s.L.G.	Mont.	3,315,000	663,000	5	*		197,970	July 1886 .06
77	Helena & Frisco, s.L.	Idaho	2,500,000	500,000	5			170,000	July.. 891 .01
78	Helena & Victor	Mont.	1,000,000	200,000	5			80,000	May.. 1891 .05
79	* Holmes, s	Nev...	10,000,000	100,000	100	370,000	May. 1890 .25	75,000	April 1886 .25
80	Homestake, G	Dak..	12,500,000	125,000	100	200,000	July 1878 1.00	4,903,750	Oct 1892 .10
81	Honorine, s. L	Utah.	500,000	250,000	2	37,500	April 1889 .05	125,000	Sept. 1887 .05
82	Hope, s	Mont.	1,000,000	100,000	10	*		285,000	Oct.. 1892 .25
83	Horn-Silver, s. L	Utah.	10,000,000	400,000	25	*		4,600,000	Sept. 1892 .12½
84	Hubert, G	Colo..	1,000,000	1,000,000	1	*		247,000	Dec.. 1889 .00½
85	Idaho, G	Cal..	310,000	3,100	100			2,373,500	Aug.. 1892 2.50
86	Illinois, s	N. M..	100,000	100,000	1			45,000	April 1889 .20
87	Iron Hill, s	Dak..	2,500,000	250,000	10	134,000	July. 1889 .03	156,250	Nov.. 1887 .07½
88	Iron Mountain, s	Mont.	5,000,000	500,000	10	*		215,000	Aug.. 1892 .03
89	Iron-Silver, s. L	Colo..	10,000,000	500,000	20	*		2,500,000	April 1889 .20
90	Jackson, G. S.	Nev..	5,000,000	50,000	100	237,500	Nov.. 1880 .20	60,000	Jan. 1891 .10
91	Kearsarge, C	Mich..	1,000,000	40,000	25	190.000	Oct.. 1887 1.00	80,000	Jan. 1890 2.00
92	Kennedy	Cal...	10,000,000	100,000	100			387,000	May.. 1892 .15
93	Kentuck, s. G	Nev..	3,000,000	30,000	100	454,180	Oct.. 1891 .15	1,350,000	Dec. 1886 .10
94	La Plata, s. L	Colo..	2,000,000	200,000	10	*		610,000	Sept. 1892 .30
95	Leadville Con., s. L.	Colo..	4,000,000	400,000	10	*		448,000	May.. 1892 .03
96	Lexington, G. S.	Mont.	4,000,000	40,000	100	*		609,000	Jan. 1890 2.00
97	Little Chief, s. L	Colo.	10,000,000	200,000	50	*		820,000	Dec.. 1890 .05
98	Little Rule, s	Colo..	500,000	500,000	1			220,000	Dec.. 1891 .02
99	Maid of Erin	Colo..	3,000,000	600,000	5			450,000	Nov.. 1891 .25
100	Mammoth, s. L. C	Utah	10,000,000	400,000	250	110,000	1882 .25	1,040,000	Dec.. 1891 .10
101	Martin White, s	Nev..	10,000,000	100,000	100	1,275,000	Jan.. 1892 .25	140,000	Dec.. 1886 .25
102	Mary Murphy, s. G	Colo..	350,000	3,500	101	*		175,000	May.. 1888 5.00
103	Matchless, s. L	Colo..	500,000	500,000	1	*		15.000	Feb.. 1890 .00½
104	Maxfield	Utah.	3,000,000	300,000	10			117,000	April 1892 .03
105	Mayflower, D. gravel	Cal	1,000,000	100,000	10			75,000	Sept. 1891 .25
106	May Hazeppa, s. L	Colo..	1,000,000	100,000	1	*		205,000	Oct.. 1891 .03½
107	Minas Prietas, G. S.	Mex..	1,000,000	100,000	10	*		350,000	Dec.. 1890 .50
108	Minnesota, C	Mich.	1,000,000	40,000	25	420,000	April 1886 1.00	1,820.000	Mar.. 1876
109	Mollie Gibson, s	Colo..	5,000,000	1,000,000	5			2,400,000	Oct. 1892 .15
110	Monitor, G	S.Dak	2,500,000	250,000	10			45,000	Oct.. 1890 .03
111	Mono, G	Cal..	5,000,000	50,000	100	769,000	Sept. 1890 .25	12.500	Mar 1886 .25
112	Montana, Lt., G. S.	Mont.	3,300,000	660,000	5	*		2 619,075	June. 1891 12½
113	Morning Star, s. L	Colo..	1,000,000	100,000	10			925,000	April 1891 25
114	Morning Star Drift, G	Cal..	240,000	2,400	100			75,800	July.. 1892 3 00
115	Moulton, s. G	Mont.	2,000,000	400,000	5	*		380,000	Dec.. 1887 07½
116	Mt. Diablo, s	Nev..	5,000,000	50,000	100	137,500	June 1880 2.00	210.000	July.. 1891 10
117	Napa, q	Cal..	700,000	100,000	7			500,000	Oct.. 1892 .20
118	Navajo, G. S	Nev..	10,000,000	100,000	100	520,000	May. 1891 20	229,950	April 1889 .10
119	Newton	Cal ..	10,000,000	100,000	100			10,000	May.. 1891 .05
120	New California, G	Colo..	800,000	160,000	5	*		48,800	May.. 1890 12½
121	New Guston, s	Colo..	550,000	110,000	5			1,877,500	April 1892 .75
122	North Banner Con	Cal ..	1,000,000	100,000	10			20,000	July.. 1891 .05
123	North Commouw'th	Nev .	10,000,000	100,000	10			25,000	June. 1891 .25
124	N. Hoover Hill, G. S.	N. C .	300,000	120,000	2½			40,000	Dec.. 1885 .06½
125	North Belle Isle, s	Nev..	10,000,000	100,000	100	445,000	Aug. 1891 .25	230,000	May. 1888 .50
126	North Star, G	Cal.	1,000,000	100,000	10			360,000	April 1889 .50
127	Omaha Cons., G	Cal..	2,400,000	24,000	100			41,000	May.. 1892 .15
128	Ontario, s. L	Utah	15,000,000	150,000	100			14,325,000	Oct.. 1892 .50
129	Ophir, G. S.	Nev..	10,000,000	100,000	100	4,210,640	April 1890 .50	1,595,800	Jan.. 1880 1.00
130	Original, S. C	Mont.	1,500,000	60,000	25	*		138,000	Jan.. 1889 .05
131	Oro, S. L. G	Colo..	500,000	100,000	5			95.000	July, 1890 .20
132	Osceola, C	Mich..	1,250,000	50,000	25	480,000	April 1876 1.60	1,647,500	Sept 1892 1.00
133	Pacific Coast, B	Cal...	1,500,000	15,000	100			315,000	Sept. 1892 1.00
134	Parrot, C	Mont.	1,800,000	180,000	10			1,6 4,000	Sept. 1892 .10
135	Petro	Utah.	10,000,000	10,000	100			17,500	July. 1891 .75
136	Plumas Eureka, G	Cal..	1,406,250	140,625	10			2,645,559	April 1892 .18
137	Plymouth Con., G	Cal...	5,000,000	100,000	50	*		2,290,000	Feb.. 1888 .40
138	Quicksilver, pref., Q	Cal...	4,300,000	43,000	100			1,823,911	June 1891 1.25
139	" com., Q	Cal...	5,700,000	57,000	100			643.867	July 1882 40
140	Quincy, C	Mich..	1,250,000	50,000	25	200,000	Dec.. 1862	6,320,000	Aug.. 1892 3.00
141	Red Cloud	Idaho	1,000,000	200,000	5			113,000	Aug. 1892 .05
142	Reed National, s. G.	Colo..	500,000	500,000	1	*		50,000	Dec.. 1890 .01
143	Retriever, L	S.Dak	1,250,000	250,000	5			20,000	Aug.. 1891 .03
144	Rialto, G	Colo..	300,000	300,000	1	*		50,250	April 1892 01½
145	Richmond, s. L	Nev..	1,350,000	54,000	25	*		4,346,323	Aug.. 1891 .25
146	Ridge, C	Mich..	500,000	20,000	25	219,939	Mar . 1886 .50	99,788	Feb.. 1880 .50
147	Robinson Con., s. L.	Colo..	10,000,000	200,000	50	*		585,000	Mar 1886 .05
148	Running Lode, G	Colo..	1,000,000	1,000,000	1			36,000	May 1892 .00 1-10
149	Savage, s	Nev..	11,200,000	112,000	100	6,772,000	Feb.. 1892 .50	4,460.000	June 1889 3.00
150	Sheridan, s. G	Colo.	300,000	3,000	100	*		300,000	Oct.. 1891 2.50
151	Shoshone, G	Idaho	150,000	150,000	1			7,500	April 1883 .01
152	Sierra Buttes, G	Cal..	2,225,000	122,500	10			1,507,257	April 1892 .12
153	Sierra Nevada, s. G.	Nev..	10,000,000	100,000	100	6,411,910	June 1892 .25	102,000	Jan.. 1871 1.00
154	Sierra Nevada, s. L.	Idaho	1,000,000	1,000,000	1	*		40,000	May.. 1889 .02
155	Silent Friend	Colo..	500,000	500,000	1			60,000	Aug.. 1891 02½
156	Silver Cord, s. L. G	Colo..	4,500,000	450,000	10			265,000	April 1889 .10
157	Silver King, s	Arlz..	10,000,000	100,000	100	130,000	Nov. 1890 .30	1,950.000	July 1887 25
158	Silver Mg.of L.V.,s.L.	N. M..	500,000	500,000	1			300,000	Dec.. 1891 4 05
159	Silde	Colo..	500,000	5,000	100			20,000	Nov.. 1891 4.00
160	Small Hopes Con., s.	Colo..	5,000,000	250,000	20	*		3,162,500	Oct.. 1890 .10
161	Spring Valley, G	Cal..	200,000	200,000	1	50,000	Oct.. 1886 .25	50,000	Jan 1881 .25
162	Standard, G. S.	Cal...	10,000,000	100,000	100	100,000	June 1890 .50	3,635,000	July.. 1892 .10
163	Stormont, s	Utah.	500,000	500,000	1	*		155,000	Nov.. 1881 .05
164	St. Joseph, L	Mo...	1,500,000	150,000	10	*		1,974,000	Dec.. 1890 .02
165	Swansea, G. S.	Colo.	600,000	60,000	10			33	June 1892 .10
166	Tamarack, C	Mich..	1,250,000	50,000	25	520,000	April 1885 3.00	3,160,000	Oct.. 1892 .00
167	Teal & Poe	N. M..	150,000	150,000	1			9,000	Nov. 1891 .01½
168	Tombstone, G. S. L.	Ariz..	12,500,000	500,000	25	*		1,250,000	April 1882 .10
169	United Verde, C	Ariz..	3,000,000	300,000	10	*		207,500	Jan.. 1892 .10
170	Viola Li., s. L	Idaho	750,000	150,000	5	*		337,500	Nov. 1888 .37½
171	Ward Con., s	Colo..	2,000,000	200,000	10			20.000	Dec. 1889 .05
172	Woodside, s. L	Utah.	100,000	100,000	10			25.000	Oct.. 1889 .25
173	W. Y. O. D.	Cal..	30,000	15,000	4	22,500	May. 1891 .10	21,000	May.. 1892 1.10
174	Yankee Girl, s	Colo.	1,300,000	260,000	5			1,405,000	April 1891 1.50
175	Yellow Jacket, G. S.	Nev	12,000,000	120,000	10	5,808,000	Sept. 1892 .2	2,184,000	Aug. 1871 1.50
176	Yosemite No. 2	Utah.	1,000,000	100,000	10			25,000	Oct.. 1891 .05
180	Young America, G	Cal..						175,000	Jan.. 1884 1. 0

NON-DIVIDEND PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied.	Assessments. Date and am of last.
55	Denver City, s	Colo..	5,000,000	50 0.0	11	*	
56	Denver Gold, G	Colo..	300.000	60,000	5		
57	Dickens-Custer, s	Idaho	2,100,000	420,000	5		
58	Durango, G	Colo..	500,000	500,000	1	*	
59	Eastern Dev. Co., Lt.	N. S..	1,500,000	150,000	10	990,000	Mar . 1886 1.00
60	El Dorado, G	Cal..	1,000,000	250,000	4	*	
61	El Taiento, G	U.S.C.	1,000,000	500,000	2		
62	Emma, s	Utah.	625,000	500,000	125		
63	Emmons, s. L	Colo..	2,000,000	2,000.000	1		
64	Empire, s	Utah.	10,000,000	100,000	100		
65	Eureka Tunnel, s. L.	Nev...	10,000,000	100,000	100	*	
66	Exchequer, s. G	Nev...	10,000,000	100,000	100	940,000	Jan.. 1892 .25
67	Found Treasure, G. S.	Nev...	10,000,000	100,000	100	130,500	Jan.. 1892 .10
68	Gogebic I. Syn., I	Wis..	5,600,000	200,000	25		
69	Gold Bank, G. S	Colo	250,000	250.000	1	*	
70	Gold Cup, s	Colo..	500,000	500,000	1	*	
71	Golden Era, s	Mont.	2,000,000	200,000	10	*	
72	Gold Flat, G	Cal...	1,000,000	100,000	10	5,000	Mar.. 1892 .05
73	Gold King, G	Colo..	1,650,000	350,000	5		
74	Gold Rock, G	Cal...	1,000,000	500,000	2		
75	Golden Feather C	Cal..	900,000	180,000	5		
76	Goodshaw, G	Cal..	10,000,000	100,000	100	*	
77	Goodyear G. S. L	Mont.	1,000,000	200,000	5	13,000	Feb.. 1892 .01
78	Grand Belt, C	Tex..	12,000,000	120,000	100		
79	Grand Canyon, S	Ariz..	375,000	75,000	5		
80	Grand Duke, s	Colo..	800,000	80,000	10		
81	Gregory Con., G	Mont.	3,000,000	300,000	10		
82	Harlem M. & M. Co., G.	Cal..	1,000,000	200,000	5		
83	Tartery Con., G	Cal..	1.000,000	100,000	10	22,000	Oct.. 1890 .05
84	Hartshorn, g. s. l.	S.Dak	1,250,000	250,000	5	8,750	Sept. 1891 .00½
85	Head Cent. & Tr., s. G.	Ariz.	10,000,000	100,000	100	16,981	Mar.. 1892 .03
86	Hector, G	Cal..	1,500,000	300,000	5	45,000	Jan.. 1889 .15
87	Highland, C	Mich..	500,000	25,000	20		
88	Himalaya, g. s	Utah.	1,800,000	180,000	10	12,800	Oct. 1892 .00½
89	Holywood	Cal..	200,000	100,000	2		
90	Hortense, s	Colo..	2,000,000	200,000	10		
91	Huron, C	Mich..	1,000,000	40,000	25	280,000	May . 1887 3.00
92	Idaho, G. S	Idaho	1,250,000	250,000	5		
93	Inez, S. L	Idaho	1,000,000	1,000,000	1		
94	Ingalls, G	Colo..	100,000	20,000	5		
95	Ironton, I	Wis..	1,000,000	40,000	25		
96	Iroquois, C	Mich..	1,250,000	50,000	25		
97	Kentuck Con	Nev..	10,500,000	105,000	100	57,750	July. 1892 .10
98	J. D. Reymert, s	Ariz..	10,000,000	100,000	100		
99	Julia Con., G. S	Nev..	11,000,000	110,000	100	1,463,000	Jan.. 1889 .10
100	Justice, G. S. C	Colo.	500,000	500,000	1	*	
101	Lacrosse, G	Colo..	1,000,000	100,000	10	*	
102	La Cumbre, G. S	Mex..	150,000	3,000	50	*	
103	Lee Basin, s	Colo..	5,000,000	500,000	10		
104	Little Josephine, s	Colo..	250,000	50,000	5		
105	Lone Star Cons., G	Cal..	500,000	500,000	1	10,000	April 1892 .00½
106	Lynx Creek, G	Ariz..	237,500	47,500	5		
107	Madeleine, G. S. L	Colo..	750,000	150,000	5	4,500	Feb. 1892 .00½
108	Mammoth Gold, G	Ariz..	245,000	49,000	5	*	
109	Mayflower Gravel, G	Cal..	1,000,000	100,000	10	*	
110	Medora, G	Dak..	250,000	250,000	1	585,000	Mar . 1892 .50
111	Merrimac Con., G. S.	Colo..	5,000,000	500,000	10		
112	Mexican, G. S	Nev...	10,000,000	100,000	100	2,917,500	Oct.. 1892 .50
113	Michigan, G S	Mich..	2,500,000	100,000	25	40,000	Mar.. 1892
114	Middle Bar, G	Cal...	400,000	200,000	2	*	
115	Mike & Starr, S. C	Colo..	1,000,000	200,000	5	*	
116	Milwaukee, S	Mont.	500,000	500,000	1	*	
117	Minah Cons	Mont.	1,250,000	250,000	5		
118	Modoc Chief, I. S. G.	Idaho	1,000,000	200,000	5	5,000	Jan.. 1892 .00½
119	Monitor, G	Colo..	100,000	100,000	1	12,500	May. 1891 .01
120	Montreal, G. S. L	Utah.	750,000	150,000	5	4,500	Feb.. 1892 .00½
121	Mountain Ledge, G	Cal..	500,000	100,000	5		
122	Mount McClellan	Colo.	1,500,000	300,000	5		
123	Mutual Mg. & Sm	W'sh.	100,000	100,000	1	*	
124	Native, C	Mich..	1,000,000	40,000	25		
125	Neath, G	Colo..	1,000,000	100,000	10		
126	Nelson	Cal..	50,000	10,000	5		
127	Nevada Queen, S	Nev...	10,000,000	100,000	100	200,000	Oct.. 1889 .25
128	New Germany, G	N. S..	100,000	100,000	1	*	
129	New Gold Hill	N. C	1,750,000	350,000	5		
130	New Pittsburg, S. L.	Colo..	2,000,000	200,000	10	*	
131	New Queen Gold, s	Colo..	800,000	160,000	5		
132	North Standard, G	Cal..	10,000,000	100,000	100	20,000	Nov.
133	Occ'dental Con., g.s		10,000,000	100,000	100	245,000	April 1892 .25
134	Oneida Chief, G	Cal...	500,000	125,000	100	*	
135	Oriental & Miller, S.	Nev...	10,000,000	400,000	100		
136	Original Keystone, S.	Nev..	10,000,000	100,000	100	250,000	Mar.. 1892 .10
137	Osceola, G	Nev...	5,000,000	500,000	10	*	
138	Overman, G. S	Nev...	11,520,000	115,200	100	4,001,840	May . 1892 .10
139	Park, S	Utah.	2,000,000	200,000	10		
140	Parker, G	N. C.	750,000	150,000			
141	Pay Rock, S	Colo..	1,000,000	200,000	5		
142	Peer, S	Ariz..	10,000,000	100,000	100	190,000	Feb.. 1892 .10
143	Peerless, S	Ariz.	10,000,000	100,000	100	405,000	Oct.. 1890 .15
144	Pennsylva'a Cons., G	Cal ..	5,150,000	515,000	10	36,050	Feb.. 1892 .10
145	Phœnix, G	Ariz..	500,000	500,000	1	*	
146	Phœnix Lead, S. L	Colo..	100,000	100,000	1	*	
147	Pilgrim, G	Cal...	600,000	300,000	2	*	
148	Pioche M. & R., S. G. L.	Utah.	20,000,000	2,000,000	10		
149	Poorman, Ltd., S. L.	Idaho	250,000	50,000	5		
150	Potosi, S	Nev...	11,200,000	112,000	100	1,573,000	Mar.. 1892 .50
151	Proustite, S	Idaho	250,000	250,000	1	*	
152	Puritan, S. G	Colo..	1,500,000	150,000	10	*	
153	Quincy, C	Colo..	3,000,000	300,000	10		
154	Rainbow, G	S.Dak	1,250,000	250,000	5	4,250	July. 1892 .00½
155	Rappahannock, G. S.	Va ..	250,000	250,000	1	*	
156	Red Elephant, S	Colo..	500,000	500,000	1	*	
157	Red Mountain, S	Colo..	300,000	60,000	5		
158	Ropes, G. S	Mich..	2,000,000	90,000	25	167,200	Feb. 1891 .50
159	Ruby & Dun., S. L. G.	Nev..	25,300	506	50		
160	Russell, G	N. C.	1,500,000	300,000	5		
161	Sampson G. S. L	Utah.	10,000,000	100,000	100	288,15.	July. 1888 1.08
162	Seal of Nevada, G. S.	Nev..	5,000,000	100,000	50	*	
163	Silver Age, S L G	Colo..	2,000,000	200,000	10	*	
164	Silver Bell, S	Ariz..	850,000	170,000	5		
165	Silver King, S	Cal..	2,000,000	400,000	5		
166	Silver Queen, C	Ariz	5,000,000	200,000	25	*	
167	Silverton, S	Colo..	300,000	60,000	5		
168	Siskiyou Con., L	Cal...	2,000,000	200,000	10	13,000	May.. 1892 .01½
169	South Bulwer, G	Cal..	10,000,000	100,000	100	100,000	May . 1889 .25
170	South Hite, G	Cal..	10,000,000	100,000	100	195,000	Jan. 188 .05
171	South Pacific, G	Cal..	500,000	100,000	5		
172	Stanislaus, G	Cal..	2,000,000	200,000	10		
173	St. Kevin, S	Colo..	100,000	100,000	1	*	
174	St. Louis & Mex., S	Mex..	1,000,000	500,000	10		
175	St. Louis & St. Elmo.	Colo..	1,000,000	200,000	10		
176	St. L. & St. Felipe, G. S.	Mex..	1,500,000	150,000	10		
177	St. L. & Sonora, G. S.	Ariz..	3,000,000	300,000	10	*	
178	Stenwinder, L. S	Idaho	500,000	100,000	1		
179	Sunday Lake, L	Mich..	1,250,000	50,000	25		
180	Sullivan Con., G	Dak..	600,000	200,000	3	*	
181	Sylvanite, S	Colo..	5,000,000	500,000	10	*	
182	Taylor-Plumas, G	Cal..	325,000	65,000	5	3,575	Mar . 1892 .01½
183	Telegraph, G. S	Cal..	325,000	65,000	5	3,575	Mar. 1892 .01½
184	Telegraph, G. S	Mex..	100,000	100,000	1	70,000	Feb.. 1892 .10
185	Teresa, G. S	Cal..	1,000,000	200,000	5	10,000	Feb.. 1888 .10
186	Tioga Con., G	Nev...	10,000,000	100,000	10	295,000	May . 1888 .25
187	Tornado Con., G. S.	Nev...	100,000	100,000	1	*	
188	Tuscarora, S	Nev...	10,000,000	500,000	20	385,000	Jan 1892 .25
189	Union Con., G. S	Nev..	10,000,000	100,000	100	370,000	June 1892 2
190	Utah, S	Nev..	10,000,000	100,000	100	245,000	Aug.. 1892 .25
191	Ute & Ulay, S. L	Colo..	1,000,000	200,000	2	1,500	Mar.. 1892 .0018
192	Valley, G	Cal.	575.000	460,000	125		
193	Wall Street, G. S. L.	Colo..	500,000	500,000	1		
194	Washington, C	Mich..	1,000,000	40,000	25		
195	West Argentine, S	Colo..	750,000	150,000	5		
196	West Granite Mt., S.	Mont.	500,000	100,000	5	*	
197	Whale, S	Mont.	5,000,000	500,000	10	*	
198	Wood River, G	Idaho	2,000,000	200,000	10	3,000	Aug. 1891 .00½
199	Yuma, C. S. G	Ariz..	10,000,000	400,000	25		
200	Zelava, G. S	C. A	600.000		2		

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid $1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000. Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Cons. Virginia $42,790,000. ** Previous to the consolidation of the Copper Queen with the Atlanta. August, 1885, the Copper Queen had paid $1,350.000 in dividends. ¶ This company paid $190,000 before the reorganization in 1880. *** This company acquired the property of the Raymond & Ely Company which had paid $3,075,000 in dividends. **** Previous to this company's acquiring Northern Belle, that mine declared $2,400,000 in dividends against $425,000 in assessments.

STOCK MARKET QUOTATIONS.

Aspen. Oct. 15

The closing quotations were as follows:

Argentum Juniata	$ .77
Aspen Deep Shaft	.12
Aspen Contact	4.00
Best Friend	.18
Bimetallic	.25
Bushwacker	28@.30
Carbonate Chief	.11
Empire Champion	.20
Justice	.10
Little Annie	.16@.18
Mollie Gibson	9.75
Pontiac	12@ 14
Sheep Mountain S. & M. Co	20@.25
Smuggler	19.50
Yellow Boy	.20

Baltimore, Md. Oct. 20.

Company.	Bid.	Asked.
Atlantic Coal	$....	.85
Balt. & N. C.	.02	.06
Big Vein Coal	....	1.00
Conrad Hill	.01	.06
Cons. Coal	.28	....
Diamond Tunnel	....	....
George's Creek Coal	....	1.08
Lake Chrome	....	.15
Maryland & Charlotte	....	...
North State	....	....
Silver Valley	.65	.75@.80

Pittsburg, Pa.

Prices highest and lowest for the week ending October 21st:

Company.	H.	L.
Allegheny Gas Co	$.....	$.
Bridgewater Gas Co	28.00	27.00
Chartiers Val. Gas	13.00	12.25
Luster Mining Co	9.00	8.13
Mansfield C. & C. Co	8 75	8 25
Manufacturers Gas Co	27.75	27.00
Nat. Gas Co. of W. Va	....	....
N. Y. & Clev. Gas Coal Co.	52.00	50.00
Ohio Valley Gas Co	....	....
Pennsylvania Gas Co	12.00	10.00
People's Natural Gas Co	28 50	27 50
People's N. G. & P. Co.	15.75	15.00
Philadelphia Co	23.00	22.25
Pine Run Gas Co	....	....
Pittsburg Gas Co	....	....
South Side Gas Co	....	....
Tuna Oil Co	....	....
Union Gas Co	....	....
Wheeling Gas Co	20.00	19.00
W'house E. Light	25.00	23.50
W'house Air Brake Co	136.00	....
W'house Brake Co., Ltd	100.00	95.00

St. Louis. Oct. 19.

The closing quotations were as follows:

	Bid.	Asked.
Adams, Colo	$.....	$....
American & Nettie, Colo	.25	.31¼
Bi-Metallic, Mont	10.50	12.00
Central Silver	....	....
Elizabeth, Mont	.40	....
Granite Mountain, Mont	7.00	10.00
Hope	....	....
Little Albert	....	....
Montrose Placer, Colo	....	....
Mickey Breen	....	....
Pat Murphy, Colo	.02½	.05
Silver Age	....	....
Silver Bell	....	....
Small Hopes, Colo	.95	....

Helena, Mont.

(Special report by Samuel K. Davis.)

Prices highest and lowest for week ending October 15th:

	H.	L.
Bald Butte (Mont.)	$2.00	$1.75
Benton Group, Mont	.35	.25
Bi-Metallic, Mont	10.50	9.50
Bi-Metallic Extension	30	.25
Champion (Oro Fino), Mont	.25	.20
Combination (Philipsb'g), Mont.	1.05	.75
Cornucopia, Mont	....	....
Cumberland (Castle), Mont	.40	.35
Elizabeth (Phillipsburg), Mont	.40	.37½
Glengary (Butte), Mont	....	....
Helena & Victor, Mont	1.10	1.00
Iron Mountain (Missoula), Mont	1.00	.95
Lone Pine Consolidated	3.00	2.85
Moulton, Mont	....	....
Polaris (Beaverhead Co.), Mont	....	2.25
Poorman (Cœur d'Alene), Idaho	.85	.82½
Queen of the Hills (Neihart)	....	....
Whitlach Union & MacIntyre	.50	

Foreign Quotations.

London.

	Highest.	Lowest.
Oct. 8.		
Alaska Treadwell	£2½	£2¼
Amador, Cal.	2s.	1s. 6d.
American Belle, Colo.	1s. 8d.	1s. 4d.
Can. Phosphate, Can.	£⅛	£¼
Colorado, Colo.	9d.	3d.
De Lamar, Idaho	£1 7-16	£1 15-16
Dickens Custer, Idaho.	6s.	3s.
Eagle Hawk	2s. 6d.	1s. 6d.
East Arevalo, Idaho	....	....
Eberhardt, Nev.	6s.	3s.
Elkhorn, Mont	£1 9-16	£1 7-16
Elmore, Idaho	....	....
Emma, Utah	1s. 9d.	1s. 3d.
Esmeralda, Nev.	9s.	3s.
Flagstaff, Utah	1s.	6d.
Golden Feather, Cal.	18s.	17s.
Golden Gate, Cal.	7s.	6s.
Golden Leaf, Mont.	1s. 3d.	9d.
Jay Hawk, Mont.	10s.	9s.
La Luz, Mex.	1s. 3d.	9d.
La Plata, Colo.	6s.	3s.
Maid of Erin, Colo.	20s.	15s.
Mammoth Gold, Ariz.	....	....
Mount McClellan	4s.	3s.
Montana, Mont.	4s.	3s.
Mona Lake Gold	....	....
New California, Colo.	....	....
New Consolidated	....	....
New Eberhardt, Nev.	2s.	1s.
New Gold Hill, N. C.	6s.	3s.
New Guston, Colo.	16s. 3d.	13s. 9d.
New Hoover Hill, N.C.	....	2s. 6d.
New Russell, N. C.	....	....
New Viola, Idaho	9s.	3s.
Old Lout, Colo	£⅜	£¼
Parker Gold, N. C.	1½s.	1½s.
Pittsburg Cons., Nev.	2s. 6d.	1s. 6d.
Poorman, Idaho	7s. 3d.	6s. 9d.
Plumas Eureka, Cal.	£⅜	£⅛
Richmond Con., Nev.	12s. 6d.	10s.
Ruby, Nev.	6s.	3s.
Sierra Buttes, Cal.	£⅜	£¼
Plumas Eur., Cal.	£⅜	£⅛
Silver King	£⅜	£¼
United Mexican, Mex.	2s.	1s.
Yankee Girl, Colo.	8s. 6d.	8s.

Paris.

	Francs.
Oct. 6.	
East Oregon, Ore	0.75
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	725.00
Lexington, Mont	102.00
" parts	2 40
Nickel, New Caledonia	950.00
Rio Tinto, Spain	382 00
" " oblig	511.25
" "	515 00
Tharsis, Spain	113.75
Vieille-Montagne, Belgium	507 50

San Francisco, Cal.

Names of Stocks.	Closing Quotations. Oct. 14.	Oct. 15.	Oct. 17.	Oct. 18.	Oct. 19.	Oct. 20.
Alpha	....	....	....	....	....	....
Alta	.35	.35	.30	.30	.25	....
Belcher	....	....	....	....	....	....
Belle Isle	.10	.10	.10	.10	.10	.15
B. & Belch	2.10	2.00	2.00	1.75	1.55	1.60
Bodie	.35	.35	.35	.30	.25	.30
Bulwer	.30	.30	.30	.30	.30	.30
Challar	1.05	.90	.85	.90	.75	.75
Com'w'lth	....	....	....	....	....	....
Con. C. & V.	3.90	3 75	3.75	3.75	3.05	3.20
Con. Pac.	....	....	....	....	....	....
Crown Pt.	1.35	1.30	1.40	1.30	1.25	....
Del Monte	....	....	....	....	....	....
E'rekaCon	....	2.00	1.50	2.00	....	2.00
G'ld & C'y	1.35	1.30	1.15	1.30	1.00	1.05
Hale & N.	2.00	1.65	1.55	1.65	1.40	1.55
Mexican	1.70	1.65	1.45	1.65	1.25	1.30
Mono	.05	.05	.30	.25	.25	.30
Mt. Diablo	...	1.00	1.00	1.00	1.00	....
Navajo	.10	.10	.10	.10	.10	.10
Nev. Qu'n.	.05	.05	.10	.05	.05	.10
N. B'lelsle	.10	.10	.10	.10	...	.10
N. Co'w'th	....	....	....	....	....	....
Ophir	2.90	2.70	2.75	2.70	2.45	2.45
Potosi	1 10	1.05	1.00	1 05	.95	....
Savage	1.25	1 15	1.15	1.00	.75	.85
Sierra Nev	1.80	1.70	1.55	1.70	1.45	1.50
Uni'n Con	1.45	1.40	1.40	1.30	1.20	1.30
Utah	.25	.30	.20	.30	.15	....
Yel. Jack.	1.45	1.85	1.35	1.35	1.15	1.25
	....	....	....	....	....	....

COAL STOCKS.

Name of Company.	Oct. 15. H.	Oct. 15. L.	Oct. 17 H.	Oct. 17 L.	Oct. 18. H.	Oct. 18. L.	Oct. 19. H.	Oct. 19. L.	Oct. 20. H.	Oct. 20. L.	Oct. 21.* H.	Oct. 21.* L.	Sales.
Col. C. & I.	43¾	42¾	43⅜	43⅝	42	41¾	41¾	41⅜	41⅜	41¼	.....	.....	7,315
Cons Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
Del. & H. C.	.....	.....	135⅞	135¼	134½	...	134¾	134	134⅝	134⅛	.....	.....	940
D., L. & W. R.R.	154	.....	155	153¾	153⅝	153¼	153¾	153¼	154	153¾	.....	.....	7,700
Hocking Valley	.....	.....	.....	.....	29	.....	29¼	29	30	29½	.....	.....	1,100
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	...
Hunt & Br'd Top	35¾	30¾	.....	.....	37¼	.....	37¾	37¼	.....	.....	.....	.....	435
do. pref	.....	.....	53½	.....	.....	.....	.....	.....	.....	.....	.....	.....	20
Lehigh C. & N.	...	...	53⅞	53¾	53⅞	53¾	53⅞	53½	.....	.....	.....	.....	796
Lehigh Val. R.R.	58⅝	...	58¾	57¼	58	57⅛	57⅛	57¼	.....	.....	.....	.....	5,241
Maryland Coal	.....	.....	.....	.....	23	.....	.....	.....	.....	.....	.....	.....	100
Morris & Essex	.....	.....	.....	.....	153	.....	.....	.....	.....	.....	.....	.....	...
N. J. C. R. R.	130¾	.....	130¼	129⅜	129¼	127¼	128	127¼	129	128	.....	.....	4,[illegible]
N.Y., Susq. & W	19¼	18¾	.....	.....	18¾	18	18⅛	13	.....	.....	.....	.....	1,100
Do. pref	67½	.....	67	.....	...	...	66½	...	.....	.....	.....	.....	240
Nort. & W.R.R.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Do. pref	.....	.....	41¾	40½	.....	.....	40¾	39⅞	.....	.....	.....	.....	514
Penn. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Penn. R. R.	56	55⅞	56	55⅞	56	55¾	56	55⅞	.....	.....	.....	.....	2,618
Ph. & R. R. R.	58¾	58	59⅛	58¼	58	57¼	57⅝	57¼	58⅝	57⅛	.....	.....	333,511
Penn. C. & I. Co	38½	37½	39	38¾	39¼	37⅝	38¼	38¼	38½	.....	.....	.....	1,770
Do pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

*Holliday. Total shares sold, 387,963.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, No. 8, pure, 1,040, ℔ lb. .06@.08
Commercial, in bbls. and cbys. .015@.017
Carbonic, liquefied, ℔ lb. .30
Chromic, chem pure, ℔ lb. 1.00
for batteries .40
Hydrobromic, dilute, U. S. P. .25
Hydrocyanic, U. S. P. .45
Hydrofluoric .20
Alcohol—95%, ℔ gall. $2.30@$2.40
Absolute $3.80
Ammoniated $2.80
Alum—Lump, ℔ cwt $1.65@$1.75
Ground, ℔ cwt $1.75@$1.85
Powdered, ℔ lb. .04½@.06
Lump ℔ ton, Liverpool £5
Aluminum Chloride—Pure, ℔ lb. $1.25
Amalgamating solution, ℔ lb. .60
Sulphate, ℔ cwt. $1.90@$2.50
Ammonia—Sul., in bbl. lots, ℔ lb. .02½@.03
Carbonate, ℔ lb., English and German. .07¾
Muriate, white, in bbls., ℔ lb. .08½
Aqua Ammonia—(in cbys) 18° ℔ lb. .03@.04
20°, ℔ lb. .04@.05
26°, ℔ lb. .05@ 0575
Antimony—Oxymur, ℔ lb. .04@.06
Regulus, ℔ lb. .10@.11¼
Argols—Red, powdered, ℔ lb. .15
Arsenic—White, powdered ℔ lb. .02½@.03
Red ℔ lb. .05@.065
Yellow .08@.09
White at Plymouth, ℔ ton £12 2 6
Asbestos—Canadian, ℔ ton $50@$300
Italian, ℔ ton, c. i. f. L'pool £18@£60
Ashes—Pot, 1st sorts, ℔ lb. 4.75@5
Pearl .06@.06¼
Asphaltum—
Prime Cuban, ℔ lb. .04@.05
Hard Cuban, ℔ ton $23.00@$30.00
Trinidad, refined, ℔ ton $30.00@$35.00
Egyptian and Syrian, ℔ lb. .05@.07¼
Californian, at mine, ℔ ton $12.00@$26.00
at San Francisco, ℔ ton. $15.00@$29.00
Barium—Carbonate, pure, ℔ lb. .45
Carbonate, commercial, ℔ lb. .05@.10
Chlorate, crystal, ℔ lb. .75
Chloride, commercial, ℔ lb. .05@.10
pure, ℔ lb. .16
Iodide, ℔ oz. .40
Nitrate, ℔ lb. .06 ¼@.07¼
Sulph., Am. prime white, ℔ ton $17.50@$19
Sulph., foreign, floated, ℔ ton $21@$23
Sulph., off color, ℔ ton $11.50@$14.00
Carb., lump, f. o. b. L'pool, ℔ ton £6
No. 1 Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " £3 15 0
Bauxite—℔ ton $10.00
Bichromate of Potash—Scotch, ℔ lb. .11@.12
American, ℔ lb. .11@.12
Bichromate of Soda—℔ lb. .09½@.10
Borax—Refined, ℔ lb., in car lots. .08@.08½
San Francisco .08½
Concentrated, in car lots .07½@.08
Refined, Liverpool ℔ ton £29
Bromine—℔ lb. .15@.20
Cadmium Minion—℔ lb. $2.00
Cadmium Iodide—℔ lb. $5.50
Chalk—℔ ton $1.75@$2.00
Precipitated, ℔ lb. .05@.06
China Clay—English, ℔ ton. $13@$18.00
Domestic, ℔ ton $9@$11
Chlorine Water—℔ lb. .10
Chrome Yellow—℔ lb. .10@.25
Chrome Iron Ore—℔ ton, San Francisco $10.00
Chromalum—Pure, ℔ lb. .40
Commercial, ℔ lb. .12
Cobalt—Oxide, ℔ lb. $2.50@$2.90
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary .03¼@.0 ¾
" extra .04½
Nitrate, ℔ lb. .40
Copperas—Comm'n, ℔ 100 lbs $1.25@$1.50
Best, ℔ 100 lbs. $1.50
Liverpool, ℔ ton, in casks £2@£2 10s.
Corundum—Powdered, ℔ lb. .04½@.09
Flour, ℔ lb. .03
Cryolite—Powdered, ℔ lb., bbl. lots. .07
Emery—Grain, ℔ lb. (℔ kg.) .04½@.05
Flour ℔ lb. .02½@.10
Epsom Salt—℔ lb. 01@.01¼
Feldspar—Ground, ℔ ton. $14.00@$20.00
Crude $8.00@$10 00
Fluorspar—Powdered, No. 1, ℔ ton. $30.00
French Chalk—
Fuller's Earth—Lump, ℔ ton. $20@$25
Glauber's Salt—in bbls., ℔ lb. .0125@.0150
Glass—Ground, ℔ lb. .10
Gold—Chloride, pure, crystals, ℔ oz. $12.00
pure, 15 gr., c. v., ℔ doz. $5.40
liquid, 15 gr., g. s. v., ℔ doz. $5.50
Chloride and sodium, ℔ oz $6.00
15 gr., c. v., ℔ doz. $2.88
Oxide, ℔ oz. $27.25
Gypsum—Calcined, ℔ bbl. $1.25@$1.50
Land Plaster
Iodine—Resublimed $3.30@$3 35
Iron—Nitrate, 40°, ℔ lb. .01¼
47°, ℔ lb. .02½
Kaolin—*See China Clay.*
Kieserite—℔ ton $9@$10
Lead—Red, American, ℔ lb .06¾@.07¼
White, American, in oil, ℔ lb. .06½@.07½
White, English, ℔ lb., in oil .08½@.08¾
Acetate, or sugar of, white .11@.12
Granulated
Nitrate .09@.10
Lime Acetate—Am. Brown .90@.95
" Gray. $1.75@$1.87½
Litharge—Powderod, ℔ lb. .06¾@.07½
English flake, ℔ lb. .09@.09½
Magnesite—Crude, ℔ ton of 1,015 kilos $14 75
Calcined, ℔ ton of 2,240 lbs. $22.00
Brick, ℔ ton of 2,240 lbs. $47.50
Manganese—Ore, per unit .23@.28
Oxide, ground, ℔ lb. .02½@.06½
Mercuric Chloride—(*Corrosive Sublimate*) ℔ lb. .66@.70
Powdered, ℔ lb. .64
Marble Dust—℔ bbl $1.25
Mineral Paint—Brown ℔ ton. $20@$25
Red $20@$25
Mineral Wool—Ordinary slag .01½
Ordinary rock .02½
Ground, ℔ ton
Mica—In sheets according to size.
1st quality, ℔ lb. .25@$6.00
Naphtha—Black
Nitre Cake—℔ ton $10.00
Ochre—Rochelle, ℔ lb. $1.10@$1.50
Washed Nat Oxf'rd, Lump, ℔ lb. .06½@.06¾
Washed Nat Oxf'rd, Powder, ℔ lb. .07@.07½
Golden, ℔ lb. .03@.05
Domestic, ℔ ton $12@$20
Oils, Mineral—
Cylinder, light filtered, ℔ gal. .14@.16
Dark filtered, ℔ gal. .10@.13
Extra cold test, ℔ gal. .20@.24
Dark steam refined, ℔ gal. .09@.12
Phosphorus—℔ lb. .50@.55
Precip., red, ℔ lb. .82@.85
white, ℔ lb. .85@.90
Plumbago—Ceylon, ℔ lb. .04@.05
American, ℔ lb. .05@.07
Potassium—Cyanide, ℔ lb., C. P. .70
67%, ℔ lb. .45
50%, ℔ lb. .40
Bromide, domestic, ℔ lb. .23@.25
Chlorate, English, ℔ lb. .14@.15
Chlorate, powdered, English, ℔ lb. .13@.13¼
Carbonate, ℔ lb., by casks, 82% .04½@.05¾
Caustic, ℔ lb., pure slick .06@.06½
Iodide, ℔ lb. $2.58@$2.80
Nitrate, refined, ℔ lb. .06@.08
Bichromate, ℔ lb. .10@.11½
Yellow Prussiate, ℔ lb. .24@.25½
Red Prussiate, ℔ lb. .40@.45
Pumice Stone—Select lumps, ℔ lb. .03½@.15
Original cks., ℔ lb. .01½@.02
Powdered, pure, ℔ lb. .01½@.01¾
Pyrites—Non-cupreous, p. units. .12@.15
Quartz—Ground, ℔ ton $12.50@$17.50
Rotten Stone, Powdered, ℔ lb. .03¼@.03¾
Lump, ℔ lb. .06@.07
Original cks., ℔ lb. .04½@.05¼
Rubbing stone, ℔ lb .03½@.04
Sal Ammoniac—lump, in bbls., ℔ lb. .80¼
Salt—Liverpool, ground, ℔ sack .700
Domestic, fine, ℔ ton $7@$7.5
Common, fine, ℔ ton $4.50@$5
Turk's Island, ℔ bush .26@.28
Salt Cake—℔ ton $10.00
Saltpeter—Crude, ℔ lb. .03¼@.04
Soapstone—Ground, ℔ ton $8@$
Block and slab according to size.
Sodium—Prussiate, ℔ lb. .22@.23
Phosphate, ℔ lb. .04@.05
Stannate, ℔ lb. .08@.15
Tungstate, ℔ lb.
Hyposulphite, ℔ lb., in casks. .0235@.0245
Strontium—Nitrate, ℔ lb. .08¾@.09
Sulphur—Roll, ℔ lb. .02½
Flour, ℔ lb. .02¾
Sylvinit, 27@35%, S.O.P., per unit .40
Talc—Ground French, ℔ lb. .01¼@.01½
American No. 1, ℔ lb. .01@.01¾
American No. 2 .006
Terra Alba—French, ℔ lb. .75@.80
English, ℔ lb. .70@.75
American, No. 1, ℔ lb. 1.00
American, No. 2, ℔ lb. .45@.50
Tin—Crystals, in kegs or bbls. .14@.15
feathered or flossed. .25
Muriate, single .07@.08
Double or strong, 54° B. .10@.12
Oxymur, or nitro .19
Vermilion—Imp. English, ℔ lb. .85@.90
Am. quicksilver, bulk .57 @.62
Am. quicksilver, bags .58 @ .62
Chinese .85 @$1.00
Trieste .90 @ .95
American .11½@ .12
Zinc White—Am., Dry, ℔ lb. .04½@ 05
Antwerp, Red Seal, ℔ lb. .06¼@.07½
Paris, Red Seal, ℔ lb. .08@.08½
Muriate solution .06
Sulphate crystals, in bbls., ℔ lb. .03¾

THE RARER METALS.

Aluminum—℔ lb. .50@.65
Arsenic—(Metallic), per lb. .40
Barium—(Metallic), per gram $4.00
Bismuth—(Metallic), per lb. $2.25
Cadmium—(Metallic), per lb. $1.00
Calcium—(Metallic), per gram $10.00
Cerium—(Metallic), per gram. $7.50
Chromium—(Metallic), per gram. $1.00
Cobalt—(Metallic), per lb. $6.00
Didymium—(Metallic), per gram. $9.00
Erbium—(Metallic), per gram $7.50
Gallium—(Metallic), per gram $140.00
Glucinum—(Metallic), per gram $12.00
Indium—(Metallic), per gram $9.00
Iridium—(Metallic), per oz. $7.00
Lanthanum—(Metallic), per gr. $10.00
Lithium—(Metallic), per gram $10.00
Magnesium—(Powdered), per lb. $4.00
Manganese—(Metallic), per lb. $1.10
Chem. pure, per oz. $10.00
Molybdenum—(Metallic), per gm .50
Niobium—(Metallic), per gram $5.00
Osmium—(Metallic), per oz. $65.00
Palladium—(Metallic), per oz. $35.00
Platinum—(Metallic), per oz. $7@$8
Potassium—(Metallic), per lb. $28.00
Rhodium—(Metallic), per gram $5.00
Ruthenium—(Metallic), per gm. $5.50
Rubidium—(Metallic), per gram. $2.00
Selenium—(Metallic), per oz. $1.80
Sodium—(Metallic), per lb. 50@.75
Strontium—(Metallic), per gm. .60
Tantallum (Metallic), per gram. $9.00
Telurium—(Metallic), per lb. $5.00
Thallium—(Metallic), per gram .20
Titanium—(Metallic), per gram $2.20
Thorium—(Metallic), per gram $17.00
Tungsten—(Metallic), per lb. .80
Uranium—(Oxide), per lb. $5.00
Metallic, per gm .20
Vanadium—(Metallic), per gm $22.00
Yttrium—(Metallic), per gram $9.00
Zirconium—(Metallic), per oz $50 00