THE ENGINEERING AND MINING JOURNAL

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

VOL. LIII. JAN. 23. No. 4.

RICHARD P. ROTHWELL, C.E, M.E., Editor.

ROSSITER W. RAYMOND, Ph.D., M.E., Special Contributor.

SOPHIA BRAEUNLICH, Business Manager

THE SCIENTIFIC PUBLISHING CO., Publishers.

SUBSCRIPTION PRICE:

Weekly Edition (which includes the Export Edition), for the United States, Mexico and Canada, $4 per annum; $2.25 for six months; all other countries in the Postal Union, $7.

Monthly Export Edition, all countries, $2.50 gold value per annum.

REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO. All payments must be made in advance.

THE SCIENTIFIC PUBLISHING COMPANY.

OFFICERS:
R. P. ROTHWELL, Pres. & Gen'l Mang.
SOPHIA BRAEUNLICH, Sec'y & Treas.

P.O. Box 1833.
27 Park Place, New York.

Cable Address: "Rothwell, New York." Use A. B. C. Code, Fourth Edition

CONTENTS.

Page.

The War Talk and the Metal Trades 127
The Free Coinage Question 127
English Mining Investments in 1891 127
The Profits in Mining—I 128
Books Received 128
The Cheese Mine Plagiarism ..... By America 129
Mining Notes From Alaska; Production of Gold in the Territory in 1891 ..... By W. 129
* **Florida Phosphates; Methods of Mining** ..... By Francis Wyatt, Ph. D. 130
The Discovery of Gold in New Zealand 131
Ore Sampling at El Paso, Texas—II ..... By Paul Johnson, E. M. 132
Prominent Men in the Mining Industry; Arthur Winslow 133
Looking Into the Ground 134
A Large Land-Slide 134
* **The Electric Plant of the Aspen Mining and Smelting Company, Aspen, Colo** ..... By M. B. Holt 134
Prospecting in Brazil ..... By A. M. Gibson 136
Digest of Decisions of the Secretary of the Interior Relating to the Mining Industry 136
The Mineral Statistics for 1891 137
The Make of Scotch Pig Iron in 1891 137
The Portland Cement Industry in Europe and America, By Pierre Giron 137
Patents Granted 137
Personals — Obituary — Societies—Industrial Notes — Machinery and Supplies Wanted 138-139
Notes: Powder for Casting Molds, 131—A Chrome Nickel Steel for Armor Plates, 131—Discovery of Coal at the Straits of Magellan, 132—Meteorological Observations at High Altitudes, 132—An Interesting Palæontological Discovery, 134—Tesla's Experiments in Electric Lighting, 135—Soldering Aluminum, 136—A Rich Gold Find in Transylvania, 137—A Remarkable Microscope, 137.

* Illustrated.

MINING NEWS:
Alaska.....139
Arizona.....139
California.....139
Colorado.....140
Florida.....140
Idaho.....140
Kansas.....140
Michigan.....140
Missouri.....140
Montana.....141
Nevada.....141
New York.....141
Pennsylvania.....141
Utah.....141
Washington.....142
West Virginia..142

FOREIGN:
South America..142
United Kingd'm 142
MEETINGS.....143
ASSESSMENTS....144
MINING STOCK MARKETS:
New York.....142
Boston.....143
Denver.....143
San Francisco.143
St. Louis.....143
Pipe Line.....144
MINING STOCK TABLES:
Boston.....148
Coal Stocks... 148

New York.....148
San Francisco. 148
Baltimore.....150
Helena.....150
Pittsburg.....150
St. Louis.....150
Deadwood.....150
Trust Stocks..150
Aspen.....150
London.....150
Paris.....150
MARKETS:
COAL:
New York.....144
Boston.....145
Buffalo.....145

Chicago.....145
Pittsburg.....145
METALS.....146
IRON:
New York.....146
Chicago.....146
Louisville.....147
Philadelphia...147
Pittsburg.....147
CHEMICALS AND MINERALS.....142
CURRENT PRICES
Chemicals.....150
Minerals.....150
Rarer Metals..150
ADVT. INDEX.... 19

THE great work annually performed by the ENGINEERING AND MINING JOURNAL in collecting the mineral statistics of a continent, and publishing them within a few days of the close of the year to which they relate, constantly wins a wider and wider appreciation and a generous recognition from our readers. We greatly value this spontaneous approbation and thank, in this public manner, the friends, too numerous to write to individually, who have given it.

The question of a war with Chili has already affected the metal trade in many directions, notwithstanding the fact that such a war entered upon by this country without recourse to arbitration, and in the face of the precedent we ourselves established in a much more serious case (the killing of the Italians at New Orleans), would be on our part little short of a national disgrace, and is therefore quite unlikely to take place.

The great steel works of Carnegie at Pittsburg, the Bethlehem Steel Works and other establishments have been urged to complete, without delay, the armor and other work on which they have been engaged. Contracts for shells and projectiles for heavy guns have been given out at high figures to secure prompt delivery. In fact quite large expenditures have been made by the Government, as though war were actually intended. These orders are of course beneficial to the iron trade which is dull, and affect also to some extent the consumption of copper, zinc, tin and lead, but have been too small to influence the market prices of these metals.

We do not believe the enlightened sentiment of our people will permit the entering upon a war with Chili without first exhausting every honorable means of avoiding it. Perhaps had we been more careful in the selection of our representative in Chili all this unpleasant feeling and injury to our commercial interests would have been avoided. On the other hand the increased expenditures of our Government, if drawn from all the people, are at least enriching a few of our worthy and prominent citizens.

THE Coinage Committee in Congress has decided to report a bill for the free and unlimited coinage of silver, and that a vote be had upon it February 10th.

Every nation in Europe has repudiated and abandoned free coinage of silver, many of them after having had it for many years, and none of them is to-day willing to join us in re-adopting it.

1st. Every country that has to-day free coinage of silver has a monometallic currency, the gold having disappeared from circulation.

2d. In free coinage countries the wages of the working classes have declined—as measured in gold, the only universal medium—as the market price of silver bullion has declined.

3d. The present world's market price of silver, say 93 cents per ounce is maintained only by the enormous purchases of 4,500,000 ounces per month paid for in gold or its equivalent by the United States Government. What the market would decline to were this support taken away can only be conjectured.

The experience of all the rest of the world will certainly hold good here. The same causes will produce like effects here as in Europe.

1st. Does Congress then wish to reduce this country to the single silver standard, and drive over $600,000,000 of gold from circulation, thereby bringing about such a contraction in our circulating medium as to produce a financial panic?

2d. Does Congress wish to empower the rich employers of labor to pay wages, with the silver in dollars, at $1.29 an ounce, when they buy it in the open market of the world at perhaps 80 cents an ounce, or in other words does it wish to force the poor wage earners to sell $1.29 worth of labor for 80 cents worth of silver?

3d. Does Congress wish to depreciate the market value of silver by taking away the only large purchaser who pays in gold for the metal?

As an economic measure the adoption of free silver coinage by the United States alone would be pure and disastrous folly, while as a political measure (with which the ENGINEERING AND MINING JOURNAL has nothing to do) the better informed and most responsible papers in the country seem to think the majority in Congress would bring their party to sure defeat by adopting it.

ENGLISH MINING INVESTMENTS IN 1891.

It has been the common report of promoters who have visited England during the past year for the purpose of floating new mining companies that it has been next to impossible to enlist capital in such undertakings. The effects of the Baring failure of 1890 still hung over the London market long after the skies in the United States had cleared, and there was little money available for investment in mines. Only those enterprizes of the highest character have been carried easily to a successful conclusion. This condition of affairs is clearly reflected by the annual statistics of Mr. EDWARD ASHMEAD, of London, which have just been published.

From these it appears that the number of new mining companies registered in London in 1891 was 236, with a nominal capital of £19,796,546, against 298 companies with a nominal capital of £35,187,125 in 1890, and 378

companies and £41,015,425 in 1889. The decrease in nominal capital, it will be observed, was decidedly greater than the decrease in the number of companies registered. In 1888, the nominal capital averaged about £140,000 per company; in 1889 and 1890, between £110,000 and £120,000; while in 1891, it was but £85,000.

Of the 236 companies registered in 1891, ninety were organized for the purpose of mining in the United Kingdom and 146 to operate in the colonies and foreign countries. The largest number of the latter class were American companies, of which there were 41, with a capital of £5,784,390, followed by 36 African companies with a capital of £3,769,350.

The most noteworthy feature in these statistics is the small percentage of working capital provided for these companies, a fact which we have frequently criticised in the past. Of the 912 companies registered in the past three years, 228 have been public companies, from the prospectuses of which Mr. BARTLETT determines that the percentage of working capital to the total capital was but 23% in 1889; 21% in 1890, and 21% in 1891, the balance of course being taken by the venders and promoters of the properties. The experience of 30 years has proved that English mining companies do not provide sufficient funds for working capital, and failure and reconstruction has frequently resulted. Until the past three or four years the number of English gold and silver mining companies which have acquired property in this country and have made money was very small indeed. In many cases the failure has been due to unwise purchases, but in as many more there is no doubt that a different outcome might have been realized had an ample amount of money been subscribed for working capital in the beginning.

I.—THE PROFITS IN MINING; COPPER MINING COMPANIES.

The year 1891, as we showed in our statistics published January 2d, was very generally prosperous in the mining industry, and especially so among the precious metal mines, which largely increased their production. This prosperity was reflected in the amount of the dividends paid by the various companies engaged in mining, which were larger than ever before, except, perhaps, at the time when the great bonanza of the Comstock was being stoped. That was an era of mining speculation, however, before the mining industry in the Rocky Mountains had settled down to a business-like basis, and we feel safe in saying that mining has never been carried on in this country at so great profit as at present. Last year the number of mining companies which paid in dividends more than 10 per cent. on their market value was very large; a considerable proportion paid more than 20 per cent.; while some paid as high as 40 per cent. The general average is evidently higher than that realized in any other branch of industry followed in the United States.

According to our statistics which are full and accurate, ninety-seven mining companies reporting their earnings paid dividends in 1891 aggregating $17,806,825; in 1890, sixty-five companies paid $13,743,478, and in 1889, sixty-one companies paid $10,537,522. The great increase in 1890 was due in part to the appearance of new companies in the list of dividend payers, but chiefly to the larger amounts paid by the copper mines of Lake Superior, under the high prices of copper, and some of the old producers of Utah and Montana. The great increase in 1891, on the other hand, was due almost entirely to the large number of new dividend payers, few of the older mines showing any noteworthy increase, and many of them an actual falling off. This list, it must be remembered, includes only those companies which make public statements of their earnings, and does not take account of the many private enterprises and close corporations, among which are numbered some of the most profitable mining undertakings in the United States; such, for example, as the Bluebird and the great Anaconda, of Montana, the Eureka Hill and Bullion Beck & Champion, of Utah, the Aspen and Minnie, of Colorado, and most of the iron companies of Michigan and Wisconsin. Incomplete as the list is, however, an analysis of it furnishes some interesting and many valuable deductions.

Of most value are the statistics of the Lake Superior copper mines, all of which are owned and operated by public companies, which report their earnings. It appears that seven of these companies paid dividends in 1891, against eight in 1890, the Kearsarge having dropped from the list; the aggregate of dividends paid was somewhat greater, however, being $3,490,000 in 1891, against $3,415,000 in 1890. This increase was due entirely to the Tamarack and Quincy mines, the former paying $800,000 and the latter $400,000, against $590,000 and $320,000, respectively, in 1890. The dividends paid by the Quincy, this year, amounted to 40 per cent. upon the capital of the company (before it was increased on account of the Pewabic purchase) and 200 per cent. on its original capital, or the total original investment from sales of stock. Few mining companies can show such a record of profit, from the time of the opening of the mine to the present, as has this. The other Lake companies paid the same amounts in 1891 as in the preceding year, with the exception of the Osceola and the Atlantic, both of which show a falling off, the former of $75,000 and the latter of $60,000, due chiefly to a lower yield of the ore. The Calumet & Hecla paid a larger dividend than any other mining company in the United States in 1891, viz., $2,000,000; and the aggregate of its payments has now reached the enormous sum of $36,850,000.

The dividends of the seven Lake Superior copper mining companies, which paid in 1891, amounted to about 8·5 per cent. upon the average market value of their shares during the year; in 1890 the rate was somewhat lower, being about 7·5 per cent. It is important to note the price of Lake copper in connection with these figures, the prices of the mining shares fluctuating in accordance with those of the metal very closely.

In January, 1890, the average price of Lake copper in New York was 14·8c.; thence it rose steadily until 17c. was reached in September, after which the price declined to 15·9c. in December, the average for the year being 15¾c. The value of the copper shares rose and fell in sympathy with the value of the metal. In January, 1891, the average price of Lake copper in New York was 14¾c., from which figure it declined steadily to 10⅝c. in December, the average for the year being 12·9c. The year was marked by a similarly steady decline in the value of the copper stocks.

The increase in the price of copper in 1890 enabled most of the dividend-paying companies on the Lake to pay increased amounts, the Central alone showing a decrease, and the aggregate increase over 1889 being $445,000. Speculation, which always becomes an important element when there is a rise in the price of copper, carried the value of the shares higher in proportion than the profits of the mines, so that by the middle of the year prices of stocks had gone beyond all reasonable bounds. The decline was great and sharp, but the average for the year was high, the aggregate market value of the eight companies which paid dividends averaging $45,481,000. At the end of the year the aggregate market value of the same companies was $39,845,000, and on this basis the dividends of the year amounted to about 8·5 per cent.

In 1891 the aggregate market value of the seven Lake copper companies which paid dividends was $41,024,800, as against $44,833,000 in 1890, and the dividend percentage was about 8½. The market value of these companies at the close of the year was $40,265,000, on which basis the dividend payments were 8·67 per cent.

It would seem from these figures that from 8 per cent. to 8½ per cent. is the rate which investors expect to realize on investments in the Lake Superior copper mines. The rate, 7·5 per cent., paid in 1890, was evidently low, as the average market value of the shares upon which it is calculated was disproportionately high. When the shares fell in the latter half of the year they apparently went to their normal investment value. The fluctuations in the price of copper in 1891 were comparatively small, the mines demonstrating their ability to make a large yield and pay large dividends at the ruling price of the metal; hence the year may be considered a normal one, and the small difference between the aggregate market value of the dividend paying shares at the beginning and end of the year and the average may be taken in confirmation of this.

The highest rate of dividends paid by any one company in 1890 was the Osceola's, viz., 12·6 per cent. on the average market value of the shares, while the Atlantic paid 12 4 per cent. and the Kearsarge 12·3 per cent. The Franklin paid 10 8 per cent, so that four of the Lake companies yielded more than 10 per cent. In 1891, individual rates were more nearly alike, the Tamarack and Franklin, only, paying more than 10 per cent., the former's figure being 10·7 and the latter's 12.

Of the four great copper mining companies of Montana, but two, the Parrot and the Boston & Montana, report dividends; the Anaconda is a close corporation and the Butte & Boston has not yet declared any. The Boston & Montana paid in dividends in 1891 only $500,000, against $625,000 in the previous year. On the basis of the average market value of the stock in each year an investment in these shares yielded 9·6 per cent. in 1890 and 9 5 per cent. in 1891. The financial condition of this company and its prospects were freely discussed in the ENGINEERING AND MINING JOURNAL during the past year. The Parrot Company, also of Butte, more than made up for the falling off on the part of the Boston & Montana, paying $432.000, an increase of $180,000 over the previous year. In our next issue we shall consider the profits on gold and silver mining investments.

BOOKS RECEIVED.

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

A Manual of the Steam Engine. Part II. Design, Construction, and Operation. By Robert H. Thurston, A. M., LL.D., Dr. Engineering. Published by John Wiley & Son, New York, 1891. Pages 934. Price, $7.50. Illustrated.

Annual Report of the Commission of the General Land Office for the fiscal year ending June 30, 1891. Published by the Government, Washington, D. C., 1891. Pages 66. Illustrated.

Annual Report of the Comptroller of the Currency. 1891. Published by the Government, Washington, D. C. Pages, 342.

Genesis of Iron Ores by Isomorphous and Pseudomorphous Replacement of Limestone. By James P. Kimball. Published by the author. Pages, 36. Illustrated.

Geological Survey of Kentucky. Report on the Geology of parts of Jackson and Rock Castle Counties, with map. By Geo. M. Sullivan. Published by the State, Frankfort, Ky., 1891. Pages, 20.

Machine Pattern-Making. By P. S. Dingey. Published by John Wiley & Sons, New York. 1892. Pages, 90. Price, $2. Illustrated.

Methods of Gas Analysis. By Dr. Walther Hempel. Translated from the second edition by L. M. Dennis. Published by Macmillan & Co., London and New York, 1892. Pages, 384. Illustrated.

Souvenir of Park City. Her Mines, Mining, and Pleasure Resorts. Published by Jas. H. Crockwell, Salt Lake City, Utah, 1891.

CORRESPONDENCE.

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

The Cheese Mine Plagiarism.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: You have every reason to be proud of the issue of the ENGINEERING AND MINING JOURNAL of the 2d inst., for such a vast amount of statistical matter as you present to your readers (to say nothing of the advertisements) cannot fail to be of the greatest value to them. And after accomplishing such a task you are fully justified in being in the good humor that is implied in your comments on "Australian Cheese Mines" in to-day's issue, and, as an American, permit me to rejoice with you in this last exhibition of American energy. But I want to add an extra "American eagle" screech in the form of a protest against Australian plagiarism, and, incidentally, to make a correction.

The honor of the first "find" of a *cheese mine* does not rightfully be long to Australia, or to the Melbourne *Journal of Commerce*. It is strictly an American discovery (or invention). The first and only original cheese mine was found several months ago by an American, an Iowa farmer, and the announcement of this additional evidence of America's prominence was made at the time in the columns of one of the New York dailies. The circumstances of this find were identical, barring location, with those of the so-called Australian discovery, even to the depth of the well (shaft), width of pay-streak, and color and quality of the ore! But in this age of discovery and invention, and particularly in America, even such a novelty as a cheese mine is passed by almost unnoticed, and so this wonderful addition to nature's store-house of wealth in our own glorious land seemed to attract little, if any, attention in view of matters of far greater importance that are being continually brought to our notice.

But, when a young upstart of a nation like Australia attempts to steal even an echo of our thunder, and to palm it off as something uniquely and entirely its own, it is time to call a halt, and take up our cudgels in self-defense! So I come to your aid and demand of the Melbourne *Journal of Commerce* that it shall immediately apologize, and render to America that which is American!

No matter about the failure of the press to report subsequent "finds" of artesian ice cold lager beer in the immediate vicinity of the cheese mine. They were duly discovered, of course, but Iowa is a *dry* State, you know, and it might injure the cause to have such a fact published.

NEW YORK, Jan. 9, 1892. AMERICA.

Mining Notes from Alaska; Production of Gold in the Territory in 1891.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Alaska mining interests have nearly all gone to sleep for the winter; the big Treadwell mine alone is active. It is strange why other mines here are not run during the winter, as they are in Colorado, Montana and Idaho, where the weather is much more severe. The mercury seldom sinks below zero in this part of Alaska, and then only for a short time, a few hours or perhaps a day, while most of the time it is above 20°. It is true the water supply is limited during several months, but there is an abundance of fine timber, which can be bought at the mill for $4 per cord. The coal mine near Killisnoo is supplying small cargoes of coal this winter, and may soon be able to fill all local demands, which will make steam power cheap for those mills that are located on the beach. There is no reason, except lack of ambition in the management, why quartz mines in Alaska should not be worked all the year round. According to present indications, it is more than possible that, in the near future, there will be several mills that will keep the great Treadwell company as steady bullion producers.

The outlook for mining in Alaska was never better than at the present time. Several small mills were run during the past season at quite a profit to the owners; there were also quite a number of very promising quartz veins discovered and the news from the Yukon country was also very good, everyone there obtaining a goodly share of coarse gold. What Alaska needs now is a few *practical* mining men with a few thousand dollars at their command to erect mills at her mines and work them in a legitimate manner. Her bubbles are mostly bursting of their own weight. The Nowell combination managed to struggle through this season assisted by the leniency of the mortgagors, but unless Mr. Nowell succeeds in raising a few hundred thousand dollars in the East this winter, he will hardly pull his schemes through next season. This is the present condition of this undertaking, notwithstanding the fact that the "fifty-million-dollar" placer mine was run at its full capacity during the whole season, about five months, and the latter part of the work was done in the best pay dirt that is likely to be found in the basin. With entirely different management this basin placer ground as it stands to-day might pay expenses to work and possibly a small profit. Last spring an old and successful placer miner (Mr. Readshaw), who has charge of some of the largest placer mines in California, was engaged by Mr. Nowell to come here and run his mine, but the superintendant, and the foreman, and the manager, and the agent, and the accountant, and Tom, Dick, and Harry generally had so much to say that the practical miner soon became disgusted and quietly departed.

As I mentioned some time since the application of the Nowell company for a patent to its placer and other ground had quite a large number of adverse claims filed against it and the present winter term of the district court has been chiefly occupied by the trial of such claims as Mr. Nowell had not previously settled by purchase or otherwise. The company has failed to win a single case. The White Rose case, which concerns the ground at the mouth of the tunnel, is the key to the basin; on this case the jury disagreed, which will prevent the Nowell company from obtaining a patent to its ground for a considerable length of time at least. The information was also brought out at this trial by the attorney for the company that the said company does not own the tunnel which it has spent so much money in driving in order to work its placer ground. Mr. Nowell being personally insolvent could not buy anything in his own name, and the property of the Silver Bow Basin Mining Company was purchased in the name of F. H. Nowell, a son of F. S. Nowell, who was also attorney in fact for Mr. F. S. Nowell and each and all of his companies. When the Silver Bow Basin Mining Company was organized it appears that the placer claims and some other property and rights were turned over by F. H. Nowell to the company, but there is no record of this tunnel right ever having been transferred by young Nowell. The company is therefore liable to lose its whole property as it exists by virtue of the tunnel location.

Another case was thrown out of court by the obliging judge, as he did not recognize the right of a person to locate ground for a dump for the tailings from his quartz mill, although the ground was located under Section 2,327 of the Revised Statutes, as non-mineral land not contiguous to the vein and necessary for milling purposes, as otherwise there would be no place to dump the tailings from the mill. The case has been appealed to the California Superior Court, which has already decided in favor of the dump claim.

Mr. Nowell has purchased another large mining property, paying for it mostly with his personal paper; this property he has transferred to another son (Willis E. Nowell), and he proposed to organize another big stock company this winter. This property is in the vicinity of the property which the "Bear's Nest" German syndicate, Mr. Bernhardt, manager, secured control of and put into a stock company last year, placing his stock in Europe. The Germans spent $50,000 in development work last winter and this season allowed the property to revert to the original owners. Some of the owners of the stock of this company with no mine are just now a little anxious to know why there is now an assessment due on the stock. Perhaps Mr. Bernhardt can explain.

Nov. 22, 1891.

* * * * * * * * * *

On December 1st there occurred in the large pit of the Alaska Treadwell Company's mine a very serious explosion, by which two men were killed and one badly injured. The explosion was probably due to carelessness and inexperience on the part of the victims, one of whom is said to have been smoking while charging the holes. It was fortunate that many other lives were not lost, as the miners were working all about the sides of the pit at the time. The young man killed was the son of Thos. Mein, who has had charge of this mine for the past two years and who recently left to go to South Africa to take charge of a mine for the same English syndicate.

Dec. 7, 1891.

* * * * * * * * * * *

Our mines have made a much better showing than in any previous season, and this gives an idea of what might be done in this country if we had more practical men interested in the management of the mines.

Of the producing mines of this region the Alaska Treadwell leads with an output of $75,000 per month. The Taku Consolidated Company, with its 10-stamp mill, turned out about $30,000 for its season's run, which is probably only one-third of what it would have done if the tailings from the big placer mine above its mill had not occasioned so much trouble and loss. This mine is only about one mile from the beach, and can run easily all but three or four months of the year.

The Eastern Alaska Mining and Milling Company stands next with a record of $20,000 for its 10 stamps for the season. The affairs of this company were presided over by one of the largest stockholders, but as he arrived very late in the season, and found a large amount of dead work to do before he could start his mill, he was only able to run 94 days, which is a short season even in Alaska. He ran through an average of 27 tons per day, which yielded an average of $8 per ton in free gold. The company employed 16 miners and 10 outside men, the average expenses of the company per man being $3.50 per day. This company has been operating here for several years, and has apparently now got its affairs in such condition that it may look forward to deriving some profits from its next season's run.

Mr. A. Campbell's Dodge Mill made a very good showing this season, turning out about $15,000 in gold bullion. The mill handled about seven tons of ore per day, of an average value of not far from $12 per ton.

The Silver Queen Mining Company's 10-stamp mill only ran day shift. The value of the selected ore and concentrates shipped by this company this season will not greatly exceed $15,000. This is the only silver mine that has been worked, although there are quite a large number of silver properties that show good prospects.

The Webster 5-stamp mill only ran a few days to work the ore taken out of the Humboldt group of claims during the annual assessment work. The yield from the ore was more than sufficient to pay for the work. This mill should be increased and the mine worked the full season. There is no reason why the owners of such properties should allow them to stand idle.

The Yukon placer ground the past season well repaid the hardy miners and left them with good expectations for the coming season. There were 170 miners in the district and they all did fairly well, and it will probably be safe to estimate the total output at $1,000 per man. There is a great scarcity of food in the Yukon country for next season, otherwise there would probably be a rush thither in the spring, but I would advise those who may think of going not to start without food for the whole season and be sure to keep money on hand to get out again with in the fall, as the store in there will only have enough for about half the men that are already in there. There is a great opening there for a new trader, but he had better ask the Alaska Commercial Company for its permission before he tries to start and then he will probably not start.

The Silver Bow Basin Mining Company during the season washed out about $60,000 from its big placer mine. The yield from the individual placer miners' works and from the Wheelock black sand placer mine at Liturga Bay will aggregate about $25,000. The total year's output of Alaska was about $1,250,000. It is to be hoped that Alaska mines in the near future will make a much larger showing. W.

ALASKA, Dec. 15.

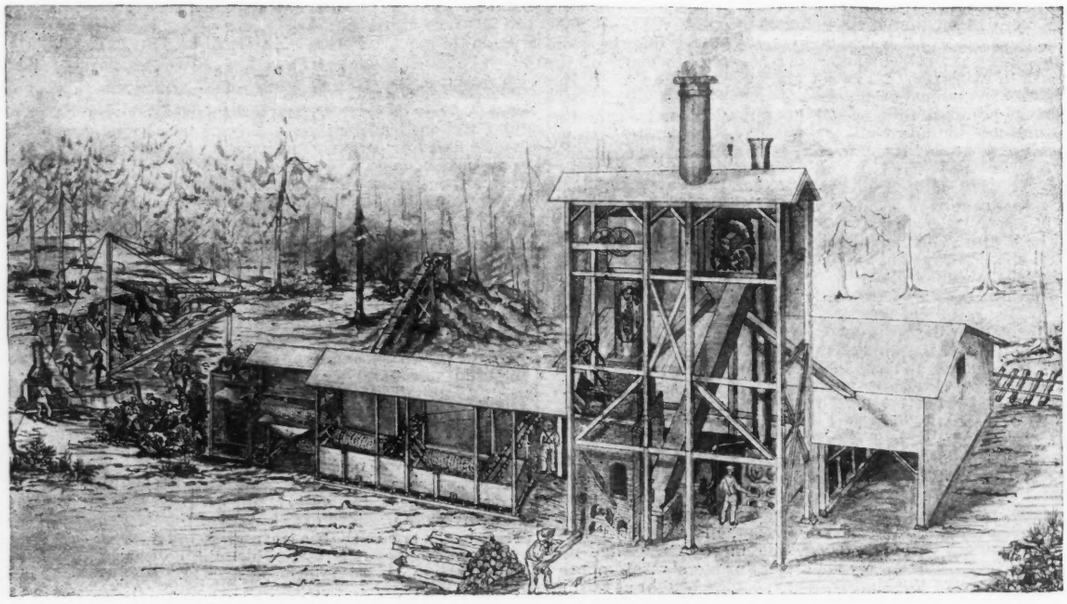
FLORIDA PHOSPHATES; METHODS OF MINING.*

By Francis Wyatt, Ph. D.

The actual chief working center for "pebble" phosphates in Florida is Peace River, which rises in the high lake lands of Polk County and flows rapidly southward into the Gulf of Mexico. Its course is extremely irregular, and its bottom is a constant succession of shallows and deep basins. Lakes Tsala-Opopka and Chillicohatchee and Pains and Whidden creeks are its chief tributaries and the main sources of its phosphate deposits, the pebbles being washed out from their banks and borne along their beds by the torrential summer rains.

The exploitation of the pebbles is performed, as illustrated, by means of a 10-in. centrifugal steam suction pump placed upon a barge. The pipe of the pump, having been adjusted by ropes and pulleys, is plunged ahead from the deck into the water. The mixture of sand and phosphate sucked up by it is brought into revolving screens of varying degrees of fineness, whence the sand is washed back into the river. The cleaned pebbles are discharged from the screens into scows, at the rate of about 12 tons per hour and are floated down to the "works," where they are taken up by an elevator to a drying-room and dried by hot air, screened once more and are then ready for market. The total cost of raising, washing, drying, screening and loading on the cars in execution of orders, is variously estimated at from 50 cents to $2 per ton; but from special information recently afforded to us by one of the largest operators we are enabled to place it at $1.40, and this, to the best of our knowledge and belief, is the lowest yet recorded in the world's history of phosphate-mining.

The pebbles, when freed from impurities and dried, are of a dark blue color, and are hard and smooth, varying in size from a grain of rice to about one inch in diameter. Their origin is proved by the microscope to be entirely organic, and they are intimately mixed up with the bones and teeth of numerous extinct species of animals, birds and fish.



FLORIDA ROCK-PHOSPHATE MINING.

Scale about ½ inch to 6 feet.

There can be no doubt that these river deposits all proceed from the banks of "drift" situated on the higher lands in Polk County, and, as a proof of it, if we take Lakeland and Bartow as the center of these "drift" beds, we shall find that the "pebbles" are all of the same size, and only differ in that they are of a lighter color than those of the river, and that they are imbedded in a matrix of sand and clay, to which they frequently bear the proportion of about twenty per cent. by weight.

Their separation from this matrix by most of the companies now working is effected in a very crude manner and on a great variety of plans. One of the largest concerns in Polk County employs a floating dipper dredge, the use of which, it claims, is naturally indicated by the fact that in this very low-lying section of the State, water springs a few feet below the soil, and thus enables the dredge to work in a canal which it deepens and extends as it removes the material. The entire mass, matrix and all, is brought up to the surface by the dredge and dropped into a species of disintegrator or crusher. Thence it passes on into a revolving washer mounted on the same barge. From the washer, the matrix and water return to the canal, while the clean nodules are carried by a spiral conveyor to a steam-heated dryer on another barge; from the dryer they fall into a revolving screen, which removes any remaining particles of adhering sand, and the now marketable phosphate is caught up by elevators and delivered on board railway cars standing on a track parallel with the canal. We have been informed that the actual capacity of this plant is 300 tons a day, and that a car-load of twenty tons can be raised, washed, dried, and loaded by it for market in forty minutes at no greater cost than that of the river pebbles. We have, however, considered it necessary to accept this statement with due reserve.

* * * * * * * * *

In working or quarrying the "hard-rock" or "high-grade bowlder" deposits, the details of most importance are the careful selection by conscientious and capable superintendents of the different qualities, and the accurate sampling and analyses of the different piles before shipment. There is at present a less remunerative market in this country than in Europe for the richest grades, and it is therefore probable that for some time to come the entire production of hard rock will be exported. As we have already said, and shall more fully explain later on, the majority of foreign manufacturers will make no contracts for a raw material which contains a higher maximum than 3% of oxides of iron and alumina. To make shipments within this limit must consequently be the aim of the miners who would establish a good reputation, and nothing but experience in actual work, *harmoniously conducted between the mine and the laboratory*, can be relied upon in the great majority of cases to accomplish it. To ourselves this matter has been a source of constant preoccupation, and in the mines with which we are professionally connected we have now succeeded in reducing objectionable constituents to a minimum by adopting the following general scheme of work:

The pockets are located by boring and by confirmatory pits, and the results of these operations are daily transferred to a map. The pits are carefully sampled, foot by foot, as they go down, and the various qualities of "bowlder," "soft white," "gravel," etc., are sent to the laboratory with ample details of their origin. The results of the analyses are daily placed upon the map, side by side with the other details of the survey.

We thus finally acquire a geological and chemical map of our property, can form an approximately correct idea of the quantity and the quality of material at our command, and can decide with intelligence upon the best points at which to commence industrial operations on the desired scale.

Our plant is so constructed as to enable us to crush the whole of our rock material to a suitable size, say 1½ in., to pass our entire output through washers and screens, and to finally dry it by hot air, avoiding direct contact with fire. The cost of producing one ton of clean phosphate rock under these conditions, as shown by our practical working experience, averages about $5, and from the fact that the method was based upon, and has fully justified the results of, a very lengthy series of laboratory experiments, we are enabled to claim for it:

1. That, the product being reduced to a uniform size, the difficulties hitherto experienced in obtaining fair and concordant samples on shipment and arrival are materially lessened, if not entirely obviated.

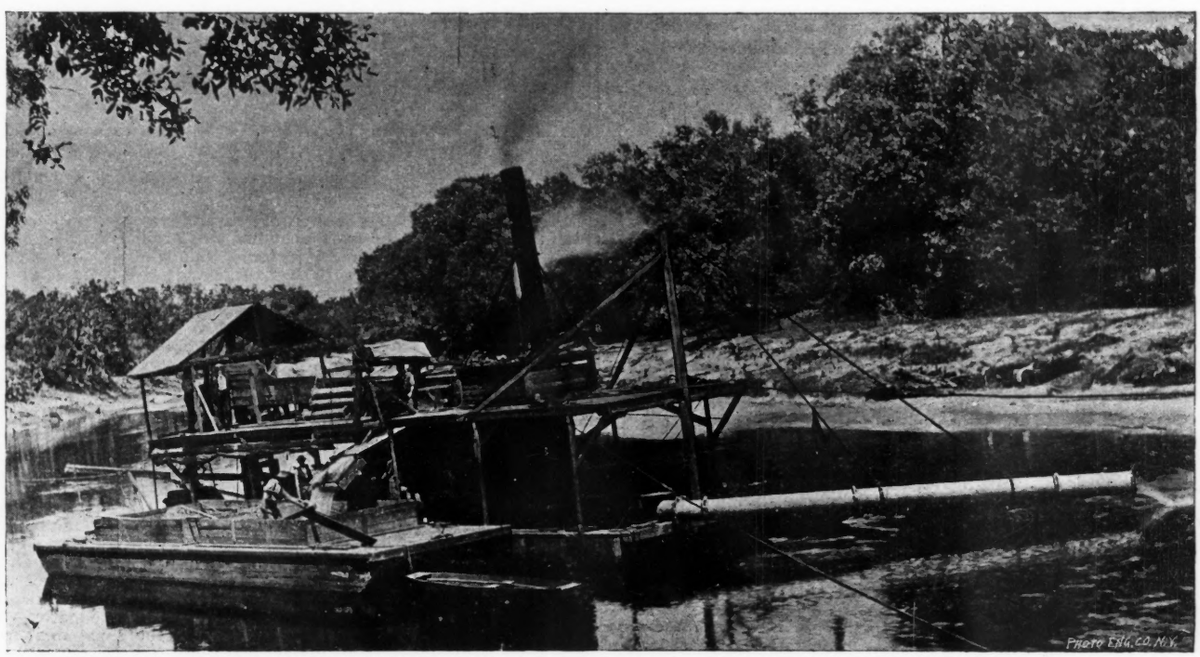
2. That the objectionable iron and alumina, being nearly *always present in the original sample in the form of clay, which is held and secreted in the interstices or cracks of the rock*, are nearly all removed by the water and the agitation during the washing process.

Of somewhat similar lines to these, a very ingenious and practical as well as economical method of mining and preparing the land-rock phosphates is that devised by the Jeffrey Manufacturidg Company, of Columbus, Ohio, and now being used by some of the larger companies. The rock is hoisted from the quarries by a derrick, delivered to a crusher, and thence into a system of screens. The first is a dry screen, the second a washing screen and the third a finishing, or rinsing, screen; and the rock is delivered from one wet screen to the other by short elevators, and then taken from the last screen by slow-motion elevator, so as to drain off as much of the water as possible. It is then delivered at the top of a furnace having interlapping shelves, under which the flues conducting the products of combustion to the stack are carried. While descending from one of these shelves to the other through the hopper-like aperture to the furnace, the rock is either heated to the necessary degree to dry it, or, by a retaining device at the bottom, may be kept until thoroughly calcined, after which it is delivered hot to the foot of an elevator. The flue connecting with this elevator and furnace is arranged with three conduits, one for the smoke and heat, one for the buckets of the elevator, and one for he dry-air

*From "The Phosphates of America," by permission of the Scientific Publishing Company,

draught. The partition between the smoke and combustion flues and that of the elevator is thin iron after reaching the height of the brickwork. The buckets are constructed of screen wire, so that the escape of vapor from the heated rock is impeded as little as possible. The partition between the bucket flue and the dry-air flue is perforated at intervals, so the draught of dry air will produce the effect of drawing off the vapor from the buckets of heated rock as they pass upward through the elevator flue. The movement of the elevator is so slow that about twenty minutes from the starting at the bottom. or boot end, are required to deliver a bucket of phosphate rock at the top; after the delivery is once commenced, however, it is continuous. At the top the chain of buckets passes through a third, or drying screen, which revolves in a square, heated chamber, shown in the illustration at the top of the dryer frame. In passing through this dry screen all the sand or material that is not rinsed or washed out of the interstices and from the clay deposit of the rock is knocked off in a separate partition of the hopper underneath the heated chamber. The phosphate rock is delivered, as shown in the space broken away, to the hopper just underneath the open end of the screen at the rear of the dryer, and is delivered, it will be observed, in chutes from this altitude to the storage bins in the warehouse, or on board cars at a railroad track, the buckets continuing their course down the inclined flue to the boot to receive the continuous flow of phosphate. There is a draught of hot, dry air thrown up this return flue that meets the phosphate being delivered from the dry screens and carries off what remaining vapor there may be arising from the heated rock through an opening into the stack above.

The operation of this system of machinery is automatic after leaving the crusher, and every motion of the rock is in the direction required to reach storage or shipment. The water supply at different mines requiring different arrangements of pumping machinery, the latter has not been included in our drawing.



FLORIDA PEBBLE-PHOSPHATE MINING; DREDGES ON PEACE RIVER.

From the dry-screen, running back to the waste or culm pile, there is a conveyor which relieves the dry-screen of the sand and material that would otherwise accumulate beneath it. Where the phosphate is found in a clay matrix, it is not practicable to use a dry-screen successfully; the latter is, therefore, in such cases eliminated, and a pug introduced in place of it, similar to the machine used in washing hematite ores and pugging clay. To prevent the clay from balling up in the revolving screens, it is thoroughly softened and disintegrated; and when this has been done it will easily wash out of the phosphate, the succeeding stages of the process being the same as in handling dry rock.

With the mere addition of a dredging apparatus, this method of exploitation is equally applicable to the "pebble" and river deposits, the process of drying, elevating and storing being quite as economical and efficient as in the case of the hard rock.

THE DISCOVERY OF GOLD IN NEW ZEALAND.

According to the *Australian Mining Standard*, gold was discovered in New Zealand on the Driving Creek, Coromandel, by Mr. Chas. Ring, in 1852, while excavating in connection with the erection of a sawmill. The discovery caused great excitement in Auckland, and large numbers flocked thither. The land upon which the gold was found belonged to the natives, and in November, 1852, an agreement was made with the Coromandel chiefs for three years, by which the Provincial Government pledged itself to pay the natives £1 per annum for each square mile of land upon which gold was being dug, and 2s. per month for each miner at work. In consequence of this arrangement the Government was obliged to impose a tax of 30s. per month on each digger, with an exemption for the first two months. About 3,000 diggers set to work, some on the river, where Mr. Ring made the discovery, and others about the Tiki. The gold obtained was sold in Auckland by public auction, the first parcel disposed of in this way being on behalf of Hugh Coolahan and party, and realized £6 13s. per oz., in December, 1852. When the two months' exemption was up only about 50 diggers took out licenses; but even this number could not make it pay, owing to the heavy taxes imposed. There were also difficulties with the natives, and the result was that the enterprise died a natural death in about six months. The total gold won amounted to about £11,000

Very little was done on the field for about nine years, when the discovery of gold in Otago gave a fresh impetus to the industry, and the Coromandel field was once more looked to as a field for enterprise. In 1862 there were about 250 diggers at work on different parts of the field, and probably owing to better knowledge of gold-washing more satisfactory results were obtained, but the Tiki and Matawai Creek specimens were found weighing as much as 30 oz. and 40 oz., and one of 11 lb. weight is said to have been obtained, containing from 60% of gold downward. Later on a party of men commenced work on a quartz reef in the neighborhood of the present Kapanga Company's mine and obtained about 2½ oz. to the the ton, and many claims were taken up. A number of the original claims were acquired and about 1864 the original Kapanga Company was formed and during the first four years' operations £40,000 worth of gold was obtained. Operations were commenced on the Tokatea Range in 1869, in consequence of a rich discovery made by Geo. McLeod, one of the original shareholders in the Tokatea Gold Mining Company. During the first three years this company was in operation £58,566 worth of gold was won from the mine, and up to date £63,625 have been paid in dividends. The Royal Oak Company, adjoining the Tokatea mine, has also been in operation for many years, and paid large sums in dividends. The Maori war had the effect, about 1864, of driving nearly every one away from the field. Then, later on, the opening of the Thames diverted attention from the field, and induced many Coromandel miners to proceed thither.

The want of adequate capital has been a serious drawback to the advancement of the field. There is not a crushing plant in any part of the district that saves anything like a fair percentage of gold, probably not 50%., yet notwithstanding this drawback, individual miners have for years past and are still making good livings. The average yield of gold from claims on the Tokatea Range is about 11 oz. per ton. Any quartz which will not yield over an ounce to the ton will not pay to take to the battery owing to the way in which the industry is handicapped, and thousands of ounces of gold have been in consequence thrown over the tip head.

Chrome-Nickel Steel for Armor Plates.—The *Compagnie des Hauts-Fourneaux, Forges et Acieries de la Marine et des Chemins de Fer* is experimenting with a new alloy for armor plates, projectiles and guns, viz., a steel containing 1% of chromium, 2% of nickel, and not more than 0.4% of carbon, the steel is first melted in an open hearth, and in the ordinary way. When the silicon and maganese in the metal have attained their proper proportions the nickel and chromium are added successively in the form of ferro-nickels and ferro-chromes, or in the shape of a double ferro-chrome and nickel.

A Powder for use in coating the interior of steel and other molds has been patented by Mr. D. Stephens, says the *Engineer*. A silicious rock known as "Dinas" silica stone, and containing about 98% of silica, 1% of alumina, 0·5% of oxide of iron, and 0·5% of lime, is washed and calcined. The stone is then ground until of the consistency of wheat-flour, contact with metal being avoided in the grinding. Sometimes 0·5% of aluminous clay is added. The above powder is mixed with water or sour beer and used as a lining for steel or other molds. It is preferably toughened by coating with tar and firing. When used for green mold steel castings the powder is dusted on the mold out of a coarse bag.

ORE SAMPLING AT EL PASO, TEX.

Written for the Engineering and Mining Journal by Paul Johnson, E. M.

(*Concluded from page* 111.)

The crushed ore having been dumped in a ring on the sampling floor it is ready for quartering down. As El Paso is a pretty hot place, the ores get pretty dry and frequently make considerable dust in handling; the heap is, therefore, when of a dusty character, sprinkled with water. As the assay is made on dried samples this does not interfere with the accuracy of the determination of its constituents. At the side of every lot to be cut down the foreman places the ticket received from the office indicating the number of the lot, this ticket following the cut-down material during the subsequent halvings, so that no misunderstanding may occur. The four men now walk round inside the ring with their shovels turning the ore into the center, making a conical heap. The contents of their shovels are placed on the top of the heap so that the lumps of ore may roll down equally all around; when the coarse is removed, all the fine stuff remaining is carefully swept up and placed on the top of the pile. This first conical heap was 6 ft. in diameter at the base and 3½ ft. high. The process of mixing lasted 20 minutes. The men now go round the pile, scraping out its contents radially so that it gets the shape of a truncated cone about 9 in. high at the center and 6 in. at the circumference; this operation lasts 5 minutes and the heap is now ready for the first cutting down. The heap is marked into quarters by a stick, and two diametrically opposite quarters are shovelled into wheelbarrows, the fine dust being carefully swept up; this cut away part is taken to the mix bin containing the original lot or to the receiving bin. This operation is done in 10 minutes; the first halving of the gross sample thus lasting 35 minutes.

The remaining two quarters are now again shoveled out to a circular ring, this taking 6 minutes; the conical heap is made up as before (9 minutes); scraped out again as a truncated cone (3 minutes): and halved (5 minutes). This second cutting down, therefore, requires 23 minutes.

A new ring and pile are made in 12 minutes; scraped out in 2 minutes; and halved in 3 minutes. The third cutting down, therefore, requires 17 minutes. The gross sample of 4,000 lbs., having been halved three times, is thus cut down to 500 lbs., or about 3 wheelbarrows, in 1½ hours by 4 men. It is a rule to cut down the sample the first time to 2 or 3 wheelbarrows before further comminution.

The sample is now crushed finer by means of Cornish rolls, 10 in. × 20 in. in size, run at 40 revolutions per minute, which are so constructed that they may be easily and thoroughly cleaned from the adhering dust after each grinding. This crushing requires about 35 minutes.

The crushed sample is now taken by two men, who make it into a cone, spread it out into a circle and then push it out into a ring, this operation taking about 15 minutes. The two men now walk round the ring, making an inner pile by taking shovelfuls from the ring and dropping these on top of the pile, this inner pile being made up and swept in 5 minutes, and being 3 ft. wide at the bottom and 1¼ ft. high. The heap is then spread out into a flat circle 6½ ft. wide and 3 in. thick, which is done in 3 minutes, and this is halved as before, the opposite quarters being rejected; this is done in 2 minutes. The whole operation of mixing and halving the ground sample thus requires 26 minutes.

The half of the sample, weighing about 250 lbs., is now brought to the rolls to be ground finer. This grinding requires 35 minutes, and the material is reduced to a fineness that the largest grains will easily pass through a No. 10 sieve. The ground material is made into a ring in two minutes, made up into a conical heap (4 minutes), scraped out to a flat circle 5 ft. in diameter by 2 in. thick (2 minutes), and halved (3 minutes). This first cutting down of the reground sample to 125 lbs. thus lasts 10 minutes.

Two conical heaps are then made of two quarters, and then one middle heap out of these by pouring each shovelful on the top of the other. This heap is then scraped out into a flat circle and halved, the whole requiring 8 minutes. Exactly the same process is used with the next two quarters, requiring for this 6 minutes. The sample is now cut down to 32 lbs.

The sample is once more cut down in the same way, and the half part, which on weighing was found to amount to 19 lbs., is put into the bucking sack, and on the top of it the tickets for the bucking-master and assayer, giving its lot number, the sample foreman tearing off his part of the ticket, filling it in, and sending it to the office. It is a rule to cut down the sample at this stage of the process, till the quantity that goes to the bucking office has a weight of between 20 and 35 lbs. This fourth cutting down requiring 5 minutes; thus the four last reductions of the finely ground sample takes 30 minutes.

The door to the bucking room is always kept closed and no other persons than the bucking master and his helper are admitted to the room; this is to exclude all possibility of other persons meddling with any sample. The sample received into the bucking-office is first passed through a No. 12 sieve. A sieve of this mesh 12 in. in diameter and 4 in. high is put into a tin pan of 17 in. diameter at the top, 13 in. at the bottom and 7 in. deep. The contents of the sample sack are poured into the sieve; what does not pass through is ground in a vertical, conical grinder called a "coffee" mill; this mill is cleaned with extreme care between the grindings of the different samples first by brushes and then by wiping with rags. When all the material is ground and sieved into the tin pan it is carefully mixed up in this by "going round" into it with a small spatula shovel, rotating the pan with the left hand in the meanwhile. When thoroughly mixed the sample is cut down two or three times until the cut away part amounts to 2½ to 3½ lbs.

This cutting down is done by means of a split shovel 12 in. wide by 12 in. long, consisting of 12 gutters 1 in. high by ½ in. wide; the split shovel is put over an empty tin pan and the contents of the other pan by means of the small spatula shovel poured over it; when the gutters are full the contents are poured into a third pan, and this repeated until the first pan is emptied. The rejected contents of the second pan are poured back into the bucking sack to be kept together with that which is afterward cut away, in case a rebucking of the sample should be required. The cut away part in the third pan is now poured over the split shovel into the second pan, and when the split shovel is full its contents are stored in pan No. 1 until all is cut down In the same way a third cutting down is made and if necessary a fourth one in order to get the final part of between 2 and 4 lbs.

The sample is now dried in a tin sample pan for three-quarters of an hour at 100°C. The dried ore is then sifted over an 80-mesh circular sieve 11½ in. in diameter, with a frame 3½ in. high, which stands on a circular pan in which the sifted material is collected; in the sieve are put some small flat iron rings, which aid in keeping the meshes from being clogged during the sieving; what does not pass through the sieve is ground to proper fineness on a blocking plate 4½ ft. long by 3 ft. wide and 1½ in. thick, with a bucking hammer 6 in. × 8 in. × 13½ in. When all has passed through the sieve the pulp is delivered to the bucking master for taking out the final sample. An important thing is to clean the bucking plate and hammer thoroughly between the different samples; this is done by grinding sand on it, brushing this off carefully and then wiping the plate with a piece of linen or cloth. Samples containing sulphide of silver or hornsilver are said to stick obstinately to the plate and one case was related in sampling a very rich silver ore containing sulphide of silver, when the plate was first cleaned by grinding it with slag and then with sand; pure lime was then ground on it to take up any silver that might still be left and this lime showed afterward on assaying to have taken up 27 oz. silver to the ton.

When the bucking master receives the sample reduced to pulp and dried, he mixes it thoroughly by rolling it several times upon itself forward and backward upon a piece of oil-cloth 2 ft. square, first taking hold of two opposite corners, then changing to the other corners and rolling at right angles to the first way; when rolled several times in these different directions he considers the sample thoroughly mixed and takes with a spatula from all parts of it and pours it alternately into 5 paper bags, put in a line, till all is bagged, thus getting in each bag about 6 oz. to 8 oz. for sample. One of these bags is now sent to the assayer, with its corresponding ticket from the office, giving the number of the lot, one is sent to the ore-seller, one is kept for umpire sample, one is reserved and kept for the assayer for future use if this should be required, and one extra one for the seller, not including the drying. The bucking of a sample takes from ¾ of an hour to 1 hour, the bucking master with his helper being able to buck from 10 to 2 samples in a day.

The labor and time required for sampling a carload of 20 tons of ore is therefore 7h. 25m. or 22·7 men-hours. If 10 hours are calculated to the shift, this will give 2·27 labor shift; thus requiring 2·27 labor shift = 0·114 labor shift per ton.

When the assayer is going to weigh out of the pulp for his assay, he pours the contents of his bag out on a piece of oilcloth 2 ft. square, and mixes it, as the bucking master did, by rolling it several times upon itself; the sample is then quartered down on the oilcloth till a quantity is obtained, some two to three times larger than what is required for the assay; this is flattened out with the spatula and small portions are taken with the spatula from all parts in weighing out the required quantity. For determining silver and gold five scorification assays of 0·1 A. T. each are weighed out, and only those buttons taken for the calculation of the silver which closely agree. All five are put together and parted for gold; the silver is reported to one-tenth part of an ounce to the ton, and the gold to half a tenth of an ounce. Repeated resamplings and assayings of lots have shown that the different results generally do not differ more than 1% of the contents when the sample is taken as described. The samples are now put in running order on shelves in the weighing room to be had for the determining of the constituents in the mines for the charges. The chemist of the works receives, for instance, from the sampling foreman a list like this: Mix 191.—Lot No. 1,357 = 32,746 lbs.; lot No. 1,420 = 39,898 lbs.; lot No. 1,428 = 39,552 lbs.; lot No, 1,444 = 4,928 lbs.; total, 117,124 lbs. The chemist now takes from the shelf sample 1,357 and weighs out from this 32·7 gr., from 1,420 he weighs out 39·9 gr., from 1,428 39·5 gr., and from 1,444 4·9 gr.; and in the same way if there are more lots put into a mix-bin. These different quantities he mixes thoroughly on a piece of oil cloth and has thus, on a small scale, made a mixture exactly representing that ore in the mix-bin. He now determines the insoluble matter—silica, iron, lime, etc.—in it, while the assayer assays the same mixture for lead, silver and gold. The results are then given to the metallurgist, who from this data makes up the proper furnace charges.

Discovery of Coal at the Straits of Magellan.—A seam of coal of very fair quality for steaming purposes is said to have been found by accident in the Straits of Magellan. Signor Fossetti, the captain of an Italian steamer, was compelled to anchor in Shagnet Bay to make some repairs, and while there he discovered coal very near the surface. Reaching Valparaiso, he sent a corps of experts to the scene of the discovery in a steam launch, who found that the coal was not only abundant but of excellent quality.

Meteorological Observations at High Altitudes.—At a recent meeting of the Berlin Meteorological Society, Dr. Assmann spoke on meteorological observations during balloon voyages and in captive balloons. For the determination of temperature, humidity, and atmospheric pressure in a free balloon, the aspiration thermometer and an aneroid barometer suffice. Comparative measurements made by Rotch in Paris and in Berlin during balloon voyages, showed that a Richards thermograph records a temperature some 8° C. higher than does a maximum and minimum thermometer, and the latter shows a temperature always 2° C. higher than does an aspiration thermometer. In order to carry out prolonged observations on humidity during a balloon trip, three aspiration thermometers must be combined, of which two are alternately moistened while the third is kept dry. For use in captive balloons self-registering instruments must be employed, whose construction, owing to the frequently violent vertical jolts of the balloon, presents considerable difficulty. The speaker exhibited tracings which showed that these difficulties had been overcome by him. Temperature is recorded by a bent Bourdon tube filled with alcohol, humidity by a hair hygrometer, and atmospheric pressure by an aneroid; all these instruments being placed in a space in which aspiration is continuously kept up. Each instrument records upon a cylinder which rotates once in about five hours. The German Ballooning Society proposes to make simultaneous observations in a free balloon and with a self-recording apparatus suspended by a long cable from the car of the balloon,

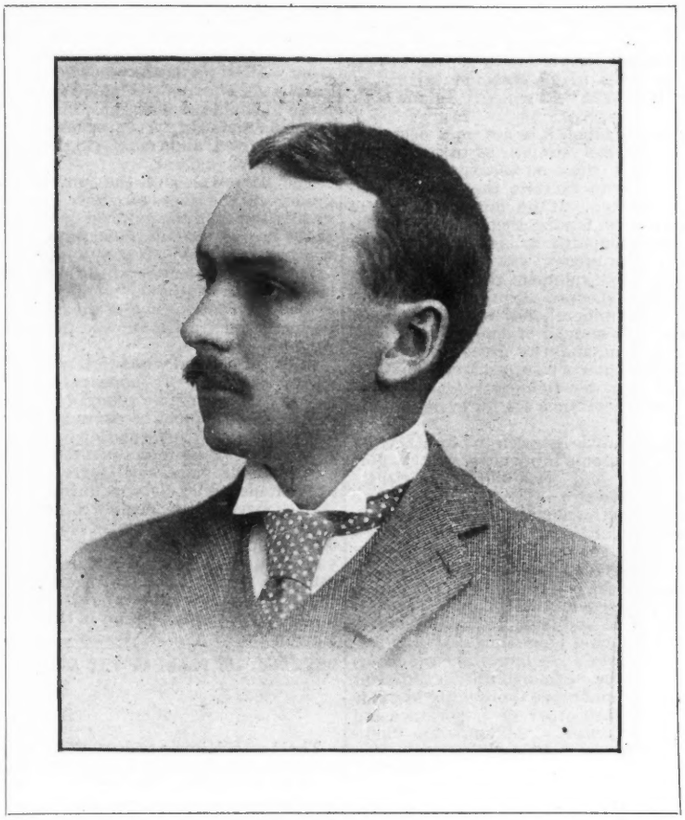
PROMINENT MEN IN THE MINING INDUSTRY.

Arthur Winslow.

The various state geological surveys which have been organized in many of the Western States during the past ten years have done much to further the mining interests of the regions in which they have operated. Particularly is this true of all the present geological survey of Missouri. which, although of very recent establishment, has already accomplished a large amount of valuable work. The credit for the efficient organization and results attained by this survey is almost entirely due to its energetic director, Mr. Arthur Winslow, who, although still a young man has already achieved an enviable fame in the branch of economic geology.

Mr. Winslow was born in Salem, N. C., August 5th, 1860. His father was Francis Winslow, who was at this time a commander in the United States Navy. He was a member of the well known Winslow family of New England, which was prominent in the Plymouth colony over 250 years ago. In 1862 Mr. Winslow was taken to Boston by his parents and shortly after this his father died of yellow fever at Key West, Fla. Mr. Winslow received his early education in the public schools in Boston, but in 1871 went to Europe and remained there for six years. The greater portion of the five years of this period was spent at Stuttgart. in Germany, where he was a regular student in the German schools. The last year was spent in France in study under the direction of a private teacher.

In 1877 Mr. Winslow returned to Boston and entered the Massachusetts Institute of Technology, from which he graduated in 1881, with degree of Bachelor of Science, in mining engineering and geology. It had been his original intention to study civil engineering, but during his first year at the Institute his inclination drew him toward mining and geology, which became his favorite study. During his course at the Institute he made numerous geological and mineralogical excursions and in his senior year carried out a detailed investigation of the geology of Brighton, a town near Boston, which became the subject of his graduating thesis.



ARTHUR WINSLOW.

Immediately after his graduation from the Institute, in 1881, Mr. Winslow secured a position as assistant on the Geological Survey of Pennsylvania. For the first six months he was engaged with Dr. H. M. Chance in the preparation of a report upon the mining methods and appliances used in the anthracite coal fields, which was published as report A C. From this position he passed to that of special assistant geologist under Mr. Charles A. Ashburner, who was then in charge of the survey of the anthracite regions. Here he was first assigned to the work of estimating the tonnages of the various coal fields. He next took up the study of and reported upon the geology of the country adjacent to the Lehigh River between the Wyoming Valley and the Blue Ridge. In 1883 he was made assistant geologist in charge of the survey of the Lehigh coal region, which work included the construction of detailed maps and sections, such as now stand among the most valuable products of the work of the Second Pennsylvania Survey and of Mr. Ashburner's labors. These years of work on the Pennsylvania Survey were rich in experience and instruction to Mr. Winslow. In coming to the Survey he passed from the stage where the study of geology was followed purely from the love of it, and in the interests of knowledge in general, to the one in which the objects of the work were almost entirely economic and in which the ends reached were concrete and immediate rather than abstract and remote.

In the summer of 1884 Mr. Winslow resigned from the Pennsylvania Survey, and during the following autumn opened an office in Raleigh, N. C., for private practice as a mining engineer aad geologist. He did this upon the recommendation of friends in the South, and with faith in the early industrial developments of that section of the country. He remained there until the autumn of 1887, and at the end of this period of three years he had succeeded in building up a very creditable practice. As is usual, however, in a small community, there was no opportunity for specialization of work and his practice had to be made to cover quite a range of engineering work. Thus, among other engagements while here, he examined and reported upon the pyrites deposits of North Carolina, upon phosphate beds, coal mines, iron ores, and tin deposits in both North Carolina and Virginia. These commissions included also the direction of active prospecting operations. He was, moreover, during this period engineer of the North Carolina State Board of Health, of the State Boundary Survey Commission and of the State Shellfish Commission. He was also engineer in charge of the Raleigh Water Works and consulting engineer for the town of Durham. This diverse work was the natural outgrowth of surrounding conditions, and through it Mr. Winslow felt himself becoming gradually separated from the proper practice of his profession.

It was in recognition of these facts, therefore, that in 1887 he accepted at some sacrifice, pecuniarily, a position in the Geological Survey of Arkansas as assistant geologist in charge of the survey in the coal regions. He began work in the month of November, and continued with the Arkansas Survey until September, 1889. The work in the coal regions during this period was, by the liberal policy of the State Geologist, Dr. John C. Branner, left entirely in Mr. Winslow's charge; in addition to this work he made a reconnoissance survey across the State from the northwest to the Red River on the south. For the work in the coal regions he devised and perfected a system of detailed mapping which made it possible to represent the topography and geological structure of over 3,000 square miles, during two years of work, on maps of a scale of one mile to the inch, with 20-ft. contours, at the exceedingly moderate cost of about $2 per square mile. These maps proved indispensable in solving the stratigraphic problems which the region presented, and in defining the limits of the coal basin; these maps, together with the report accompanying them, have not yet been published.

In August, 1889, Mr. Winslow was elected State Geologist of Missouri by the Board of Managers of the Bureau of Geology and Mines, and entered upon the discharge of his new duties near the end of the following month, September. His work since that time has been devoted chiefly to the organization and direction of the present Geological Survey of Missouri. The results thus far reached are partially contained in Bulletins 1, 2, 3 and 4 published by the Survey and in Mr. Winslow's biennial report for the years 1889–1891.

Mr. Winslow is the author of something over twenty publications of varying length and character. Among these are the following: The "Theory of Stadia Measurements, with Reduction Tables and a Method of Estimating the Contents of Highly Plicated Coal Beds," published both in report A A of the Second Geological Survey of Pennsylvania,

and elsewhere; the "Lehigh River Section," published in the annual report of the Geological Survey of Pennsylvania, 1886, part 4; "Report on Pyrites in North Carolina," published in the report of the North Carolina Agricultural Experimental Station, 1885; "North Carolina Agriculture," *Bradstreet's*, September 5th, 1885; "Tin Ore in Virginia," ENGINEERING AND MINING JOURNAL, November 7th, 1885; "Gold Mining in North Carolina," Bulletin of the North Carolina Department of Agriculture, March, 1886; "The Construction of Topographical Maps by Reconnoissance Methods," Proceedings of the Arkansas Society of Engineers, 1888; "Relations of Geology and Engineering Practice," an address before the engineering students of the Arkansas Industrial University, 1885; "A Preliminary Report Upon the Coal Regions of Arkansas," annual report of the Geological Survey of Arkansas, 1888, Vol. 3; Bulletins Nos. 1, 2, 3 and 4 of the Geological Survey of Missouri and biennial report for 1889 and 1891; "The Geotectonic and Physiographic Geology of Western Arkansas," Bulletin of the Geological Society of America, Vol. 2 pp. 225–242.

Mr. Winslow has been a member of the Boston Society of Natural History since 1881, and of the American Institute of Mining Engineers for the same period. He was an original fellow of the Geological Society of America and a member of the National Geographic Society, of the St. Louis Academy of Science, of the Boston Society of Civil Engineers, the Engineers' Club of St. Louis, and of the American Association for the Advancement of Science.

LOOKING INTO THE GROUND.

Written for the Engineering and Mining Journal by H. F. Dawes, M. E.

It is a very common saying among miners and mining men that one man can look about as far into the ground as the next one; and almost all can cite examples from their personal experience to substantiate it, and, as they believe, to prove it. But, like many common sayings, although containing truth, it does not represent "the whole truth and nothing but the truth."

In order to obtain a just estimate of any mine, it is not only necessary to report on what is visible, but to form some estimate as to probability or of the invisible; and to do this one has to draw on his experience, and, in default of this, on his imagination, and to exercise that faculty that has been held above to be common to all men. If the mining reports of some fifteen years ago or more be gone over, among them many will be found that appeal more strongly to men's cupidity by means of inflaming imagination than to their sober sense. But money was then made rapidly in other ways besides mining, and good judgment then did not seem as necessary as now in order to achieve success. In those days, after premising the manner of deposition of the mineral, they went on to show it exemplified in that particular case. The manner of deposition seems to be about as much of a mystery now as then, and the great majority of men care less of where it came from, but show a commendable commercial curiosity as to where it is and its extent and richness. And to properly judge of this is the problem of first importance set for every mining engineer to solve.

The general formula that can be integrated between the limits set by every mine, has not yet been deduced, and some think never will be. But some mines have been very justly judged and certain cases sufficiently well proved to give us great hopes for the future.

It seems necessary in the first place to be emancipated from all theories, but this, like all first steps is the most difficult. In spite of ourselves observed facts will tend to crystallize around one as an axis, and the fact that refuses to be adjusted, though disturbing, is put aside for future study and in most cases is forgotten, and the crystal building continues. When all is done, it is rather oddly shaped and a lot of facts are left over, but we made it and are proud of it and from it make spectacles through which we examine before pronouncing judgment. When free from theories the next step is to observe facts. The importance of different facts in relation to each other cannot be estimated until a sufficient number are observed, but when gone over and made thoroughly familiar with, they seem to arrange themselves in their order of importance and give us good grounds for judging in special cases. All know the "indications" of some mines and how often they are verified. Supposing "indications" be known for any particular case, it is not impossible that the value of a "prospect" for example, might be readily determined. It is true the value of many is so estimated but subsequent development has determined quite a different value.

Divining rods have proved of but doubtful utility, and there are not sufficient number of successful uses of them recorded to establish their value as prophets. The only divining rod trusted by the miner is called a drill, and to obtain the best results with it work must be directed intelligently. In order to do this the environments of all occurring ore must be carefully observed, and free from all prejudice to consider from these where they would be likely to be duplicated, if at all. The cause of these environments, and why they are as they are and not different, is no doubt of great interest, and if known might prove the master key to unlock all ore. But at present facts prove a safer guide, and though misleading at times, and absolutely refusing to lead at others, in the end will be more satisfactory and productive of better results.

The old philosophy of fitting facts to theory seems to have held longer in mining than anything else, but there seems to be the disposition now to observe facts and let theory follow as it may. The little God of Luck that was, and is now to a great extent, the patron saint of the miner has been deposed from the shrine of many and the more thoughtful have ceased to sacrifice to him.

An Interesting Palæontological Discovery.—Near Brunn, the capital of Moravia, important discoveries of prehistoric remains have been made, says the *Colliery Guardian*, which are likely to attract the attention of palæontologists all over the globe. As a canal was being dug, four and a half skulls were brought to light of dolichocephalous (long-headed) character, and of an exceedingly low stage of development. The same place contained bones and teeth of mammoth rhinoceros and reindeer. Close to the skulls lay more than 500 fossil snails, several calcinous stones with holes in the middle, and a rude figure cut out of a mammoth's tooth with a hole running through the middle.

A LARGE LAND-SLIDE.

At the last meeting of the Engineers' Club of Philadelphia, held Jan. 2, 1892, the secretary read, for Mr. Emile Low, a paper entitled "A Large Land-Slide," of which the following is an abstract:

The slide referred to occurred in a cut 543 ft. long, and of about 50 ft. maximum depth, on the line of the Clinch Valley Division of the Norfolk & Western Railroad, in Southwest Virginia, about 30 miles west from Graham Junction, on the New River Division.

The ground fell but slightly, transversely to the axis of the line, but the limestone rock in which the cutting was made, and which occurred in layers about 2 ft. thick, lay at an angle of about 45°, the line of cleavage being about parallel with the railroad line. This stratum was overlaid with one of earth and loose rock. In consequence of the dip of the rock, the lower side of the cut was nearly vertical, while the slope of the upper side was much flatter. The amount of material taken from the cut by the contractor before the occurrence of the slide was nearly 28,000 cu. yds.

The cut was dressed up in good shape and the track laid through it about the latter end of May, 1889. At this time there was no visible indications of any tendency to slide, but on the night of Saturday May 25th, 1889, or six days before the memorable Johnstown flood, considerable rain fell, and early next morning the slide occurred, unobserved by anyone. The material, as will be readily understood, all came in from the upper side of the cut, evidently following the dip of the rock. About 400 lineal feet of the track were covered to an average depth of over 20 ft. with about 6,000 cu. yds. of rock and earth intermixed.

Day and night forces, each consisting of about 50 men, were organized, and the accumulation of débris was attacked at five different points, viz., at each end of the cut, by dump cars on narrow gauge tracks and by three derricks placed close to the edge of the cut on top, two of them on the lower side and one on the upper side. The two on the lower side were worked by means of a steam hoisting engine and the other one by hand. As much of the material consisted of large slabs of limestone, too large to bandle, considerable blasting had to be done. Some little interruption from rain was experienced, but by July 3d the entire mass had been removed and tracklaying was resumed on the following day, the 4th of July.

The narrowness of the cut, which was only 14 ft. wide at subgrade, and the slopes of which were only ¼ to one for the lower 10 ft., greatly impeded the progress of the work, as only one car could be loaded at the face of the cut at one time. The cost of the removal of the slide was nearly $6,500.

The only explanation of the slide assigned by Mr. Low is that there may have been an enormous "mud-seam" between the layers of the rock, and extending from one end of the cut to the other. The cutting away of the toe by the excavation allowed the superincumbent mass to slide upon this wet seam.

In the discussion which followed the reading of this paper Mr. E. V. d'Invilliers said: It appears to me that the cause of this slide is not far to seek. In the region referred to, with which I am very familiar, land slides are of frequent occurrence, and are due to the geological structure of the region. The formations are badly faulted, strata 2,000 ft. apart geologically being found in close contact. This faulting gives rise to abnormal cleavage, with segregation of clay bands to an extent not found under other circumstances.

To the west of the locality referred to, on the Louisville & Nashville Railroad, and on the further side of the Alleghany escarpment, an enormous slide occurred in rocks of a totally different character, but similarly faulted. The ground was practically solid, and its appearance gave no cause for fearing a slide. Nevertheless, a slide occurred which cut off communication for several days, and the removal of which entailed a much greater expense than in the case described in Mr. Low's paper.

THE ELECTRIC PLANT OF THE ASPEN MINING AND SMELTING COMPANY, ASPEN, COLO.*

By M. B. Holt.

The Aspen Mining and Smelting Company, of Aspen, Pitkin County, Colorado, was the first mining company in America to employ electrical power for hoisting. Early in the year 1888 the question of power for the development of the ore-horizon, lying below the level of the tunnel through which the property is worked, became one of importance. The conditions under which it was proposed to use the power were as follows. (See Fig. 1): The company's mines lie upon the northwestern slope of a mountain, the ascent of which is at an angle of 28° from the horizon. The ore, consisting of argentiferous galena and other silver-bearing mineral, is found at or near the plane of contact of a superincumbent mass of blue limestone, with an underlying bed of dolomite. This contact plane dips north 30° west, at an angle of 60° with the horizon.

A tunnel 1,000 ft. in length, driven south into the mountain near its base, penetrates this ore mass at a vertical depth of nearly 500 ft., and through this the ore and the waste material are brought to the surface. For the purposes of drainage and transportation the tunnel has received a grade of 3% toward its mouth, while from its breast or inner extremity level branches or drifts are run both to the right and left, following the strike of the ore-bearing plane and developing it in its lateral extent. The development below the tunnel level was begun by sinking two inclines, which were intended to follow the ore plane in its descent, and which, it was contemplated, might acquire considerable depth. One of these inclines began near the inner extremity of the tunnel, and the other was started 300 ft. distant in the drift toward the north. Both descended below the tunnel level at an angle of 60°. Power applied to hoisting machinery of some kind was necessary to bring up the ore and waste material from these inclines, and from the levels that would be driven in future.

The first plan considered was the use of steam power; that of compressed air was then discussed, but both of these plans were finally set aside. Mr. Fred. G. Bulkley, the manager of the company, then determined to use electrical power, utilizing, for the generation of the current, the power daily going to waste through the channels of mountain streams

*Abstract of a paper presented at the Glen Summit meeting of the American Institute of Mining Engineers, October, 1891.

in the vicinity. Accordingly a flume was constructed, with ample capacity, giving an effective head of 63 ft., and a Pelton water-wheel, having a diameter of 5 ft., was selected for the motor. A 50-H. P., 500-volt, constant-potential Edison dynamo was located. This machine, 6,000 ft. from the mouth of the tunnel, was used to generate the current. The hoisting engine was equipped with a 7½ H. P. Sprague motor of the street car type. The motor proved the success of the plant from the start, notwithstanding the trying conditions under which it was at first used—one of which was the great amount of moisture in the workings, which condensed upon the machine. Later, the iron pinions on the armature shaft were exchanged for raw-hide pinions, diminishing the noise when running, and also the liability of any leakage of current to the levers and other parts of the machinery. The working of this motor was so successful that during the same year a similar hoist was placed at the head of the incline 300 ft. to the northeast. Each of these hoisters was destined to raise 250 tons 250 ft. up a 60° incline every 24 hours, estimating 16 hours of actual working time.

The first motor has been in constant use for hoisting for 3 years, during which time the cost of repairs has been as follows: Replacing field-magnet coils, $43; re-winding one armature, $80; replacing commutators, $75; total repairs, $198. This does not include the cost of commutator brushes, which have to be replaced from time to time—which is, however, a small item. The first item of expense above given was necessitated by the burning out of the insulation on the wires of the magnet-coils, which might have resulted from one or more of several causes. The second item is due to the bursting of the binding wires on the armature. This, had it been anticipated, might have been guarded against. The last item, caused by the wearing out of the commutators, was due to the natural wear between the commutator and the copper brushes which were originally employed.

Recently the company has put carbon brushes upon all of the motors and also uses them upon the dynamos. Since this change has been made wire, except for a distance of about 300 ft. at each end of the line, where an underwriters' insulated wire of the same size is used. Inside the mine the current is carried to the two main hoisting stations at distances of 1,000 ft. and 1,200 ft. by kerite seven-strand conductors, having a heavy insulation 1/16 in. in diameter. Okonite or Grimshaw insulated wires are used on all the other circuits inside the mine, where the insulation must necessarily be of the best. On none of the circuits inside the mine is there a loss exceeding 5%. Along the outside circuit there is at present, when the wires are carrying their maximum load, a loss of from 5% to 6%.

The cost of generating, as obtained by dividing the cost of labor and lubricants (interest and depreciation are not included) by the horse-power demanded, amounts at present to ⅝ cent. per horse power per hour; and greater amounts of power could be furnished at a lower rate per horse power, as up to 100 H. P. no increase of plant would be necessary, the cost of labor would remain the same, and cost of lubricants would advance but little.

In July, 1890, the company received from the Sullivan Diamond Prospecting Company, of Chicago, an electric diamond prospecting drill, operated by a 3-H. P. Thomson-Houston motor, and having a capacity of 400 ft., taking out a core ⅝ in. in diameter. The drill was first set up on the surface, and experiments were made with it by drilling into an immense granite boulder. It was found that, in this kind of rock, it would drill, taking out a core of the above diameter, 2 in. per minute. It was then put in the mine, where it has been used steadily for the last 12 months for exploring the hanging- and foot-walls of the mineral deposit, which are respectively a hard blue and often silicified limestone, and a brown dolomitic limestone. In these rocks the machine drills at the rate of 1½ in. to 2¼ in. per minute; or, in a shift of eight hours, allowing for all delays essential to diamond drill work, the progress made varies from 6 ft. to 32 ft., depending upon the character of the rock. The average per shift, allowing for time lost in moving, setting up and drawing cores, is 15 ft., one drillman

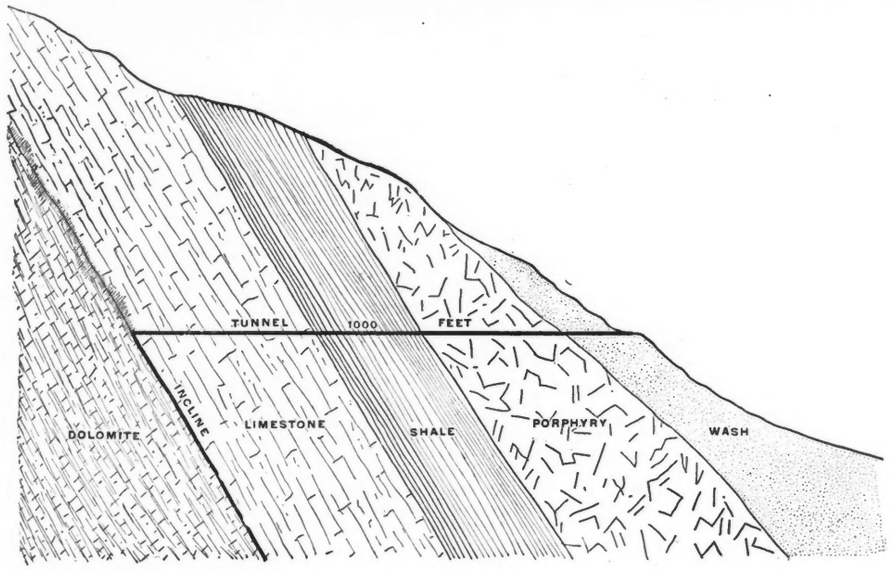


FIG. 1.

the motors have run without sparking, and the wear upon the commutators is inappreciable. The company has an extra armature that can be used in either motor-hoist, so that, in case of accident, very little time need be lost in repairing the damage. In the case of the accident to the field magnet coils, mentioned above, the burnt coils were replaced without much delay by others bought in Aspen. The total time lost due to accidents or repairs during the time the hoist has been in use amounts to twelve hours.

In the latter part of the year 1889 the company, having available water-power not in use, decided to have its own generating-plant. Previous to this it had been supplied with power from the Roaring Fork Electric Light and Power Company. Work was soon begun, and by July, 1890, the company was generating its own power. This plant has a capacity of 100 electrical horse-power, which is generated by two 50-H. P. Thomson-Houston motor-type dynamos, wound for a constant potential of 500 volts. These are run from two double Pelton water-wheels, 42 in. in diameter, *i. e.*, four 42-in. wheels, two being paired together on each shaft.

A pressure of about 35 lbs. per square inch, as indicated by a gauge at the foot of the main column pipe, is obtained from an effective fall of a little over 80 ft. The fall is obtained by fluming for a distance of 1,300 ft. The flume has a capacity of 1,000 cu. ft. of water per minute. The requirements calling for greater or less power are met by deflecting the nozzles, which work on a ball-and-socket joint, by means of a Woodward governor, set to maintain a constant speed of the water-wheel shaft from which it is actuated. The wheels are enclosed in an iron hood, 4 ft. × 4 ft., which can be taken off with little trouble, the joints being kept tight with rubber gaskets. The adjoining ends of the water-wheel shafts carry a friction clutch, by means of which the shafts can be run as one shaft when it is desired to throw the output of both dynamos on one common line.

The generating station is situated 6,000 ft. from the entrance to the tunnel. The stationary motors now in use are situated at distances of 1,800 ft., 1,200 ft. and 1,000 ft. from the entrance underground. From the power station to the tunnel the current is carried by bare 00 copper and one helper being employed. About 4,400 ft. have been drilled to date of writing, July 6, 1891. The exact cost, including all expenses, has been 68 cents per foot. This is rather higher than was expected, and it is thought that it can be reduced.

Recently, finding that the 7½-H. P. hoist at the head of one of the inclines was getting too small for the work required it was removed to another part of the mine, where it could be advantageously employed, and a 25-H. P. C. & C. electric motor put in its place. This larger motor is geared so as to raise a load of 3,000 lbs. up a 60° incline 272 ft. per minute. It is capable, by actual timing, of making the round trip from a depth of 550 ft., with a load of 3,000 lbs., in 3 minutes.

The main working-galleries of the mine are lighted by electricity, the current for which is taken from the power-mains, and five 100-volt incandescent lamps are connected up in series. As the light produced is found to be sufficient, and the life of the lamp is thereby prolonged, six of these lamps are, in most cases, placed in series with each other. Eight-H. P. of electrical energy is now employed for lighting purposes.

Tesla's Experiments in Electric Lighting.—By means of currents alternating with very high frequency, Prof. Nikola Tesla has succeeded in passing by induction through the glass of a lamp energy sufficient to keep a filament in a state of incandescence without the use of connecting wires, says Prof. William Crookes, F. R. S., in *Popular Science*, monthly for February. He has even lighted a room by producing in it such a condition that an illuminating appliance may be placed anywhere and lighted without being electrically connected with anything. He has produced the required condition by creating in the room a powerful electrostatic field alternating very rapidly. He suspends two sheets of metal, each connected with one of the terminals of the coil. If an exhausted tube is carried anywhere between these sheets, or placed anywhere, it remains always luminous, The extent to which this method of illumination may be practically available experiments alone decide. In any case, our insight into the possibilities of static electricity has been extended, and the ordinary electric machine will cease to be regarded as a mere toy.

PROSPECTING IN BRAZIL.

Written for the Engineering and Mining Journal by A. M. Gibson.

I have been in the interior of Brazil for more than a year. I landed at Rio de Janciro in August, 1890, and after spending three weeks there struck out for the interior. I went by rail to Sao Paulo, and thence by the Paulista and Mogyana railways to Uberaba, in southwestern Minas Geraes. There I bought a saddle and pack mule, and after a month's journeying and prospecting reached Sao Jose de Tocantins, where this letter was written.

I came to Brazil to look for gold and other minerals, but particularly for gold. I had read a little about Brazilian gold fields, but had never met any one who had had any experience in mining in the country. Upon my arrival at Rio I expected to find plenty of people who could tell me all about the mining regions. I was greatly disappointed. I met many people from the interior, but they knew nothing about mines or mining, except, in a vague way, that gold existed almost everywhere. I was recommended to go to Ouro Preto, the capital of Minas Geraes, where there is a school of mines and mining. Here I was told I could learn all I wanted to know from the head of the school, a French professor and mining engineer. I was about to take this advice when I met a gentleman who had studied the subject of Brazilian gold mining, and he advised me to go to Sao Jose de Tocantins, which I did.

The locality which I have prospected for a little more than a year is the southern part of the State of Goyaz, abont midway from the Atlantic coast to the western boundary of Brazil. The distance from Sao Paulo is about 900 miles, and from Uberaba, the terminus of the railway, about 420 miles. There is a fairly good road from Uberaba to this point, and freighting is done by bull teams and carts for £12 per ton.

From Uberaba I went by the way of Catalao, Bom Fim and Santa Luzia, points which will be touched by the extension of the Mogyana Railroad, now under construction. The country is rolling and fine for pasturage. There are numerous streams of water and several considerable rivers to cross. There is always timber along the streams, and occasionally patches on the npland, but the general appearance of the region between Uberaba and the Pyreneos Mountains is much like that of western Iowa. It is occupied now by ranchmen who have large herds of cattle.

Bom Fim and Santa Luzia were a century ago centers of placer mining districts. The gold was found in gravel along the streams and sometimes on the ridges. There was a sheet of gravel which apparently covered the whole country, and this in places was auriferous. I examined the country around Bom Fim and Santa Luzia very carefully, but found no traces of quartz lodes. The evidences of old placer workings were abundant. The gravel had been worked over for miles along streams and wherever water could be led around and on to the adjacent ridges. I tried all the streams but failed to get "color" anywhere.

I was told that by crossing the Pyreneos range of mountains and getting on the tributaries of the Rio Maranhao I would find gold in abundance, so I struck northeast from Santa Luzia, and after a fortnight reached São Jose de Tocantins, which is situated on the Rio Trahiras, a tributary of the Rio Maranhao. The Pyreneos Mountains are the divide between the waters flowing south into the Parana and Paraguay and those flowing into the Tocantins and Araguaya rivers, which unite at about the fourth degree of latitude, and fall into the Amazon 75 miles south of the Port of Parà. The Tocantins is known in its upper course as the Maranhao. Just where the Maranhao leaves off and the Tocantins begins it is difficult to find out, but the old maps show the stream from the junction with the Araguayo to the mouth of the Tocantins, and modern maps show the Tocantins as beginning at the junction of the Maranhao and the Paranapetinga.

So far as I can make out the Maranhao is about 500 miles in length and has numerous tributaries, some of which are from 150 to 250 miles long. The largest drainage area is east of the Maranhao. The entire region of the Maranhao is mountainous. The highest peaks of the Pyreneos are said to be 10,500 above the sea level, but the general altitude of the range is about 6,000 ft.

Immediately after my arrival at Sao Jose de Tocantins I began prospecting along the Rio Trahiras, following the stream down to the Maranhao. I found gold on the margins in the sand bars and in the bends where eddies had made deposits of sand. By diving in deep pools below rapids and bringing up gravel and sand from the bottom I always got "color." Returning from the Maranhao to Sao Jose de Tocantins I traversed the spurs of the ridge north of the Trahiras and found numerous quartz lodes. They ranged in width from a few inches at the outcrop to several feet. Occasionally by pounding up surface rock and panning I would get color. As a general rule the country is hard to prospect on account of the tropical growth, but in places I saw great veins of quartz plainly visible for some distance.

The formation is Huronian, all the rocks having been metamorphosed. There are indications of iron everywhere and vast deposits of hematites and specular ores. I saw no indications of silver on the lower Trahiras. The whole region is gold bearing and I believe very rich. It is the most promising I have ever seen, and there is but little of California, Idaho and Montana that I have not seen.

From Sao Jose de Tocantins I followed the Rio Trahiras east by north to its source. At various points along the upper stream I found gold in the gravel beds and on the riffles. Eight leagues from the fountain head I struck upon a quartz region which has a very promising appearance, and located seven lodes which I believe will prove very valuable.

I crossed over from the headwaters of the Rio Trahiras to the Rio Peixe, a tributary of the Rio Bagagen, which also falls into the Maranhao River. The mountains, spurs of the main range, are called by the natives the Formigas—or the Ant Mountains. I discovered in this locality six good lodes. This was the first place where I found any evidence of work having been done on quartz veins by the ancient Portuguese miners. Along the lower Trahiras there were plenty of evidences of the placers having been worked upon by the old miners. Thousands of square yards of country had been turned over. They found the gold in a deposit of gravel which was more or less cemented by ferric oxide. The gold evidently came from a gangue of specular iron ore. The work which was done on the quartz veins in the Rio Peixe region was by open cuts, and the rock was pounded up in stone mortars, and the gold recovered by panning in the *batea*. The cuts were never more than 20 ft. to 30 ft. deep, the water level always being the limit of their operations.

From the Rio Peixe I crossed over the Formigas Mountains to the Rio Bacalhao, also a tributary of the Rio Bagagen. On this stream and Cachoina Creek, one of its feeders, I found several promising gold quartz lodes. From all of them I obtained gold by pounding up the rock and panning. One of the lodes on Cachoina Creek appears to be at least 40 ft. in width, and traced the outcrop for more than a mile. On Carretao Creek, which falls into the Rio Bagagen, I found other quartz lodes which gave gold by pounding up the rock and panning.

I prospected the Rio Bagagen from its source streams to its entrance into the Maranhao River and found gold everywhere, sometimes getting colors only and again as high as five cents to the panful of dirt.

Two miles north of this village there is a mountain of very pure specular iron ore, and it carries some gold in a perfectly free state. Diamonds are also found in the Rio Trahiras.

There are no tools of any kind to be had here—not even a shovel or a pick. The only instrument used is a heavy iron hoe, not even steeled on the edge; I was not even able to get a handsaw, a hammer or nails. If I could have got a whipsaw to cut some boards with to make a long tom, I could have made big money working some of the gravel beds in the river at low water. The people know nothing of mining except to use the *batea*, and when they get an ounce of dust they will do no more work till they have spent that. A hundred years ago there were probably 2,000 slaves washing for gold in this locality. The only regular industry carried on here upon a large scale is ranching. The pasture in the valleys is fine, and also on the ridges. A fat steer can be bought for $5 to $10 of our money.

After having spent several months in this region I went to the capital, the City of Goyaz, about 120 miles southwest from Sao Jose de Tocantins; making that my headquarters I prospected the surrounding country within a radius of about 60 miles and found some rich quartz lodes by several of which had been worked in places down to water level of the ancient miners. One of these lodes, 40 miles northwest from the city of Goyaz, is 40 in. wide and will give not less than 5 oz. gold to the ton. There is a streak in it which is almost pure gold. Along the Vermelho, the Peixe and Ceixa rivers the ground was turned over by the old miners for miles upon miles. Fabulous stories are told of the "finds" made. It is related that one nugget was found which weighed nearly an "arroba" equal to 32 lbs.

Southwest from the city of Goyaz I made two long excursions, one of over 150 miles and the other about 75 miles, exploring two ranges of mountains and the rivers Claro and Cayaposinho. The region is wonderfully rich in minerals—gold, iron, copper, galena, asbestos, plumbago and tin. The Rio Claro is said to be rich in diamonds, which are found near its junction with the Cayapo Grande. This part of the country is not considered safe on account of the Indian tribes which occupy it.

I had no sickness during my stay in the country except one malarial attack, which yielded readily to large doses of quinine, the only medicine I brought with me. The climate is hot in December, January, February and March, but the other months are pleasant. The rainy season sets in the last of September and lasts till February. There is a regular downpour during the last weeks of September and October, and the rest of the season heavy showers and thunder storms are frequent. The living is tough, even in the city of Goyaz, which has a population of 10,000 to 12,000. The country is very picturesque and parts of it a fine agricultural land. Coffee, cotton, sugar cane and tobacco grow finely, and Indian corn is a staple article of food. Mandioca meal, made from the mandioca root, is largely consumed, while pork and beans or jerked beef and beans form the principal diet of the people. Salt is an expensive article. It is brought from the coast, and there is a great demand for it for the stock.

DIGEST OF DECISIONS OF THE SECRETARY OF THE INTERIOR RELATING TO THE MINING INDUSTRY.

Reported for the Engineering and Mining Journal.

PLACER PATENT—CONFLICTING LODE CLAIM—RECONVEYANCE TO GOVERNMENT—WHEN KNOWN, LODES NON-ENTRYABLE—PRACTICE.

Where a patented placer is found to be in conflict with a lode-claim, and the facts are such as to warrant judicial proceedings for the vacation of the patent as to the land in conflict, the patentee may, by *mesne conveyance*, surrender the title of such land to the United States, and so reinvest the Department with jurisdiction to again dispose of the land.

Townsite, homestead, pre-emption and placer-mining laws provide that entries made under them shall not include any *prior known* lodes or veins, and it is the practice of the Department when proofs are made that mines were known previous to entry and issue of patents, to recommend suit. to set aside such patents, or such parts thereof as conflict with said mines —*In re Juniata* (Colo.) *Lode-claim.* [*Rendered December 24th*, 1891; *prom January 9th*, 1892.]

MINING CLAIM—ADVERSE CLAIM—PUBLICATION—STATUTORY FEES—APPEAL.

In computing the period within which an adverse claim must be filed, the first day of publication should be excluded.

If the last day of publication falls on a legal holiday the adverse claim may properly be filed on the business day next ensuing.

It is a valid reason for refusing to accept an adverse claim that proof of publication has not been received.

The statutory fees for filing and acting upon an adverse claim cannot be required of the adverse claimant in the event of his claim being rejected by the local land office.

An appeal will properly lie from the rejection of an adverse claim.—*Waterhouse v. Scott.* [*Rendered December 24th*, 1891; *prom. January 9th*, 1892.]

Soldering Aluminum.—It is said that two pieces of aluminum can be soldered together with ease by using silver chloride as a fuse. The pieces of metal are placed together in their proper relative positions, and finely powdered fused silver chloride spread along the line of junction, after which the solder is melted on with a blowpipe.

THE MINERAL STATISTICS FOR 1891.

What our contemporaries say of the annual statistical number of the ENGINEERING AND MINING JOURNAL:

The *Tradesman*, of Chattanooga, Tenn., says: "The annual statistical number of the ENGINEERING AND MINING JOURNAL is splendid. It is a remarkable achievement, and a proof that America outstrips the world in trade journalism."

The *Mining Industry and Tradesman*, Denver, Colo., says: "The ENGINEERING AND MINING JOURNAL, of New York, issued the best and most complete statistical number on January 2d that was probably ever issued by any journal in the world."

The *American Machinist*, of New York, says: "The ENGINEERING AND MINING JOURNAL in its issue of January 2d publishes complete statistics of mineral production in this country for 1891. A very large mass of information has been gathered together, and that it should be published by private enterprise, and so soon after the close of the year, is very creditable. . . . This number of our contemporary will prove particularly valuable during the year as a reference in regard to the production of minerals."

The *Commercial Gazette*, of Philadelphia, says: "The statistical number of the New York ENGINEERING AND MINING JOURNAL is one of the most valuable yet issued. It contains a review of the mining industries in 1891 at home and abroad and tabulated statements giving the range of prices on mining stocks in all the leading markets. The ENGINEERING AND MINING JOURNAL is the recognized authority in the mining world, and the present number will be preserved as an encyclopœdia for reference on the subjects of which it treats."

The *Bulletin of the American Iron and Steel Association*, of Philadelphia, says: "Several of our trade contemporaries have issued elaborate—not to say overwhelming—statistical statements at the beginning of the new year, intended to show the progress of our country in many leading departments of industry during 1891. Most conspicuous among the statements referred to are those of the ENGINEERING AND MINING JOURNAL of New York. Such a feat in statistical journalism as it has given us has certainly never been undertaken in any country. It is simply amazing and bewildering."

The *Black Diamond*, of Chicago, says: "The entire editorial and clerical force of the ENGINEERING AND MINING JOURNAL must have spent many sleepless nights in the preparation of their annual statistical number, but their efforts were crowned with success. What an issue! It's as fat as a dictionary, and as full of statistics as the United States Census—figures that it must have taken much labor to compile. There are 172 pages in all, 78 of which are devoted to reviews of the various interests. About six pages are devoted to coal matters, in which there are the usual statistical tables as well as reviews of the trade by a number of prominent operators."

The *Journal of Commerce*, New York, says: "This work, the 'Mineral Statistics for 1891,' is the annual statistical number of the ENGINEERING AND MINING JOURNAL. The statistics have been collected and tabulated with great pains, the preparation of those relating to each mineral having been made under the care of some one especially familiar with the production and distribution of that article. The work covers the whole field of mineral statistics; it is brought down to a later date than is the case with any other general compilation of a like kind, and contains much information of great value to those interested in any of the subjects covered by it."

The *Engineering News*, of New York, says: "Our esteemed and enterprising contemporary, the ENGINEERING AND MINING JOURNAL, has done itself great honor for some years past by making its first issue of each year a special one devoted chiefly to the mineral statistics of the preceding year, which it has succeeded in compiling with remarkable promptness, and yet, as it is but just to add, with a very close approach to accuracy. This feature of the paper is now well understood by producers of metals and minerals, and we may reasonably expect to see each of these annual issues an improvement on the last. Certainly this present issue is a decided advance upon the last one, which we reviewed just a year ago, and then thought a very notable production."

The *Industrial World*, of Chicago, says: "The annual statistical number of the ENGINEERING AND MINING JOURNAL, or the first issue of the new year, is a marvel of comprehensive, useful, reliable compilation on the subjects indicated. No task and enterprise of this kind was ever before undertaken by private enterprise. Statistics gathered under authority of Government are usually so tardy in arriving at publicity as to lose much of their importance and value as records for reference; but the tabulations with their accompanying text now presented by our New York contemporary are fresh and timely, yet lacking nothing in accuracy or any other element of reliability, for each branch of the compilation, both at home and abroad, was entrusted to some faithful expert for simultaneous report, to which end the telegraph was freely used. Nearly an entire page of four columns is required to merely index the voluminous contents, which cover all the principal metals, from aluminum to zinc; all the mineral fuels, the principal products of other mining industries, chemicals, reviews of mining in the various States and Territories, and so on. Indeed, a notice like this is scarcely to be dignified as an index finger pointing to the 78 pages of copious information, which constitutes an indispensable book of reference during the year 1892. Accordingly, the publishers have for sale copies bound in cloth."

A Rich Gold Find in Transylvania.—Prof. F. Posepny writes in the *Oesterreichische Zeitschrift für Berg und Huttenwesen* about the recent discovery of gold in Transylvania as follows: "The find was made in the Musari district, lying west of the Ruda mines; formerly these were called the Carpin, Musari, Dialu Feti or Ober Lunkoj mines, which have been recently consolidated by the Geisslinger Industrial Society. To work all the mines as one plant, extensive tunnels and passages were cut recently, making a regular system of passages. In the Maria slope which is now about 2,000 ft. long, and perhaps 250 ft. beyond the third transverse passage, the important discovery of gold was made November 6th, 1891, in a cleft striking southeast. In three successive strata were secured 87 lbs., 32 lbs. and 10 lbs., or about a total of 129 lbs. of gold.

THE MAKE OF SCOTCH PIG IRON IN 1891.

The Scotch Pig Iron Trade Association has issued the following table, showing the production, consumption and export of Scotch pig iron in 1890 and 1891, and stocks on December 31st of each year:

	1891. Tons.	1890. Tons.	Decrease in 1891. Tons.
Production—As per makers' returns	674,425	798,333	123,908
Consumption—In foundries	159,428	346,782	.....
In malleable and steel works	235,152	419,613	.....
Total	394,580	766,395	371,815
Exports—Foreign	166,969	237,607	.....
Coastwise	132,761	203,770	.....
Railway to England	13,883	12,956	.....
Total	313,613	454,333	140,720
Stocks—In Connal's stores	500,957	587,652	.....
In makers' hands	78,720	25,793	.....
Total	579,677	613,445	33,768
		1891.	1890.
Number of furnaces in blast on December 31st		78	6
Average number of furnaces in blast for the year		51·054	66·215
Average price of mixed numbers G. M. B. warrants for the year		47s. 1¾d.	49s. 6¾d.
Highest price of mixed numbers G. M. B. warrants for the year		59s.	61s. 3d.
Lowest price of mixed numbers G. M. B. warrants for the year		42s. 1½d.	43s. 4d
Imports of English iron into Scotland, tons		790,000	435,000

THE PORTLAND CEMENT INDUSTRY IN EUROPE AND AMERICA.*

By Pierre Giron.

The present annual production of Portland cement in Europe amounts to over 20,000,000 bbls.; and its commercial value to over $36,000,000. The first factory was established at Northfleet, on the Thames. The process was so crude that in 1850 only four factories were in operation. In England there are now over 8,300,000 bbls. made each year. The process used there is about the same as it was twenty years ago. The raw materials are chalk and clay, both very pure, and, although inferior processes are used, they make a satisfactory cement. A few years ago the entire product of the kilns was put on the market, but the fineness of the Continental cements led English makers to improve their facilities, although even now English cement is not, as a rule, as firm as Geneva or French Portland.

The manufacture was first introduced into Germany in 1852. To-day there are 60 large works, having the same annual production as England. The raw materials are of exceedingly unfavorable character, but the makers have made a serious study of the properties and uses of Portland cement, and the producer now knows exactly what rules to follow to regulate his operations, and the consumer can depend on the product offered him. The association of manufacturers has had much to do with the immense development of the industry in Germany.

In France the industry grew slowly, the total output in 1880 hardly exceeding 750,000 bbls. a year. To-day the output is 1,800,000 bbls. The works of the Company of French Cements, at Boulogne-sur-Mer, form the largest Portland cement factory in the world, turning out about 800,000 bbls. a year. In Russia the first works were established in 1857, and there are now eight Portland cement works, making 900,000 bbls. a year. In Belgium there are four works, producing 800,000 bbls. In Italy the Portland cement industry does not properly exist, although a certain kind of natural Portland is made. In Denmark, Norway and Sweden there are 10 factories, making about 800,000 bbls.

Portland cement was imported into the United States as early as 1868. In 1882 the amount imported was 370,406 bbls., and last year it exceeded 3,000,000 bbls. But little effort has been made to develop the manufacture in this country. The materials for manufacture are as hard to handle as any in Germany, and the processes are similar. These are: (1) Grinding the rock into fine powder. (2) Molding it into bricks. (3) Drying the bricks. (4) Burning in an intermittent kiln with alternate layers of coke. (5) Grinding the clinkers.

These operations require about eight days, and require great care to produce a uniform product. The cost of the system is too great to make it successful in America. The process used in the Portland cement works at Coplay, Pa., has entirely revolutionized the science of cement-making. Here the raw compound is burnt in a powdered condition while traveling in an inclined rotary furnace in an intensely hot petroleum flame, and a few hours is sufficient to finish the process. The cement is guaranteed to stand 400 lbs. in seven days, 500 lbs. in a month, and 600 lbs. in three months, and to leave no more than 10% residue on a No. 80 sieve.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

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

TUESDAY, JAN. 19, 1892.

467,147. Process of Manufacturing Steel. Thomas S. Blair, Jr., Allegheny, Pa.
467,158. Apparatus for Treating Ores. John D. Coplen, Denver, Colo.
467,171. Process of Chloridizing Ores of Precious Metals. Charles A. Hoyt, Butte City, Mont.
467,187. Stamp Mill. James M. McFarland, Virginia City, Nev.
467,190. Rock Drill. Bernard G. Oneal, Washington, Pa.
467,193. Miner's Safety Lamp. George T. Parry, Philadelphia, Pa.
467,233. Process of Electric Metal-Working. Hermann Lemp, Lynn, and Walter S. Moody, Chelsea, Mass., Assignors to the Thomson Electric Welding Company, of Maine.
467,298. Templet for boiler holes. James McNeil, San Francisco, Cal.
467,310. Smelting furnace. Albert Piat, Paris, France.
467,389. Air compressor. Peter Weisel, Milwaukee, Wis.
467,413. Heating and puddling furnace. Owen Hughes, Cleveland, O.
467,460. Machine for casting hollow ingots. Samuel E. Light, Lebanon, Pa., Assignor of one-half to Abran J. Light, same place.

A remarkable microscope has been completed by the Munich Poeller Physical and Optical Institute for the Chicago Exhibition, at a cost of $8,750. It possesses a magnifying power of 11,000 diameters.

*Abstract of a paper read before the Engineers' Club of Philadelphia.

PERSONALS.

Mr. C. F. Memminger, mining engineer, of Charleston, S. C., has moved to Bartow, Fla., where he will open an office.

Mr. J. D. McKenzie has returned to Pratt Mines, Ala., and accepted his former position as agent for the Tennessee Coal, Iron and Railroad Company.

Dr. R. A. F. Penrose, of the Geological Survey of Arkansas, is to spend the remainder of the winter in Philadelphia. His address will be 1331 Spruce street.

"*Minerals*" is the name of a new magazine to be published monthly by the Goldthwaites, of New York, publishers of the *Geographical Magazine*. As its name indicates, it will be devoted to mineralogy.

Prof. S. Ward Loper, of Higganum, Conn., has been appointed assistant to the Board of Management of the United States Exhibit at the World's Fair. He will select and classify fossils illustrating the geologic eras.

Dr. Albert A. Michelson, Professor of Physics at Clark University, Worcester, Mass., has accepted an invitation from the International Bureau of Weights and Measures to spend the summer at its establishment, Bruetel, near Paris, to determine a new standard for the metric system, based on the vibration of waves of light.

Mr. W. J. Olcott has been promoted from the office of superintendent of the Colby mine to the position of general manager of the Penokee & Gogebic Development Company, of the Gogebic Range of Michigan and Wisconsin, vice A. L. Dickerman, resigned. Among the mines operated by the company are the Colby, Palms and Aurora.

That shameless Hartsfeld-Schmiedbarenguss-Aluminum, etc., humbug, of Newport, Ky., which is breaking out anew under the title of *The Aluminum Age*, is sending out circulars offering the "Lord's Prayer," "dime size," we suppose, as an antidote to its own hypocricy and dishonesty. How is it that such a humbug can continue to exist and gather in new crops of fools every year?

Messrs. Thomas Price, general manager, Richard Rowland, superintendent, and Thomas Evans, general agent, have resigned the management of the Sierra Nevada Land, Water and Improvement Company, of El Dorado County, Cal. Mr. Arthur Young succeeds to the management of the extensive property of the company, in which are included several promising mines.

At the annual meeting of the Lehigh Valley Railroad and Coal Companies held in Philadelphia, Pa., on the 19th inst., the following officers were elected: President, Elisha P. Wilbur; directors, Charles Hartshorn, William L. Conyngham, Ario Pardee, William A. Ingham, Robert H. Sayre, James I. Blakeslee, John R. Fell, Robert A. Lamberton, John B. Garrett, Charles O. Skeer, Calvin Pardee and George C. Thomas.

Messrs. A. T. Dewey and W. B. Ewer, publishers of the *Mining and Scientific Press*, of San Francisco, have incorporated as the Dewey Publishing Company, of which Mr. Alfred Holman, formerly editor and manager of the *Post-Intelligencer*, of Seattle, Wash., becomes general manager. The firm of Dewey & Co., Patent Agents, composed of A. T. Dewey, W. B. Ewer and Geo. H. Strong, is not included in the incorporation, and will continue to be conducted as heretofore under the name of Dewey & Co., Patent Agents.

Mr. Edgar Richards, who for the past four and a half years has been in charge of the chemical laboratory connected with the Internal Revenue Bureau at Washington, D. C., having been peremptorily directed by his physician, Dr. F. Delafield, of this city, to abstain from all work for some months in the department, and leave of absence for such rest having been denied him by the Commissioner of Internal Revenue, he has been forced to resign. Mr. Richard sails on the 23d inst., by the "Werra," for southern Europe, where he will remain several months before returning to New York.

OBITUARY.

J. M. Brookfield, of Brooklyn, N. Y., one of the largest glass manufacturers in the United States, died at Jacksonville, Fla., this week, aged 78 years.

Isaac Rapalyea, one of the pioneer gold hunters who went to California in 1849 from Jamaica, L. I., died at the last named place on the 20th inst., aged 70 years.

Isaac Reineman, superintendent of the Washington Oil Company in Washington, Pa., and one of the most prominent oil men of that field, died on the 12th inst.

John W. Brown, paymaster of the iron plant of Brown, Bonnell & Co., Youngstown, O., for nearly twenty years, died on the 15th inst. of pneumonia, aged 40 years. He was the author of the "Scale Book for Puddlers."

Dr. George Hand Smith, of Rochester, N. Y., chemist and inventor, died in London on the 18th inst, aged 67. He was for some years connected with the Cooper-Hewitt Iron Works at Ringwood, N. J. He was the inventor of the Smith gas headlight for locomotives, a process of manufacturing steel, the asphalt block pavement, and the endolithic process for coloring marble.

A. G. Darwin died at Glen Ridge, N. J., on the 21st inst., aged 65 years. He was president of the Allan Paper Car Wheel Company of Chicago, president of the Strong Locomotive Company and the San Juan Mining Company of Colorado, treasurer of the Union Construction Company, and a director of the Manhattan Quilting Company, and of the New York and Long Island Railway Company.

SOCIETIES.

The American Society of Civil Engineers has been holding its annual meeting at the house of the society, 127 East Twenty-third St., New York, during the past week. About 200 members were present. Octave Chanute, of Chicago, Ill., president of the society, presided. Sandford Fleming, of Ottawa, Can., read the report of the Committee on Standard Time. He reviewed the work of the committee since its appointment in 1881, and reported that the adoption of standard time by the railway systems of this continent was being now generally followed in the principal countries of Europe. He also stated that another branch of the committee's work in advocacy of the numbering of the 24 hours of the day consecutively was meeting with favor from leading railway corporations in this country. A resolution was adopted by the society directing the committee to take such steps as it should deem advisable to invite the railway companies of the United States, Canada and Mexico to adopt the proposed form of notation on the 12th day of October next. It is stated by Mr. Fleming in this connection that he thought that the society had good ground to hope that the day fixed by the resolution would be acceptable to the companies for making the change. John G. Dagron, of Providence, R. I., from the Committee on Uniform Methods of Testing Materials Used in Metallic Structures, read a long report on various ways of testing cast and wrought iron, steel and steel castings. The committee asked for further time to complete its work, which was granted. A number of very interesting papers were read. An expression of the society as to where its convention in June next should be held resulted in a vote in favor of Fort Monroe. The following officers were elected for the ensuing year: President, Mendes Cohen, Baltimore, Md.; vice-presidents, Samuel Whinery, Cincinnati, O.; Charles B. Brush, New York; Samuel M. Gray, Providence, R. I.; John MacLeod, Louisville, Ky. Directors for three years—William P. Craighill, Baltimore, Md.; Desmond Fitz Gerald, Brookline, Mass.; Abraham Gottlieb, Chicago, Ill.; Benjamin M. Harrod, New Orleans, La.; Leffert L. Buck, New York; John Thomson, New York. Directors for two years—Theodore N. Ely, Altoona, Pa.; Robert Moore, St. Lonis, Mo.; P. Alexander Peterson, Montreal, Can.; Robert L. Read, Cincinnatf, O.; George W. McNulty, New York; O. F. Nichols, Brooklyn. Directors for one year—Estevan A. Fuertes, Itbaca; Albert B. Hill, New Haven, Conn.; Edmund T. D. Myers, Richmond, Va.; James D. Schuyler, San Deigo, Cal.; Charles H. Myers, New York; John G. Van Horne, New York. Secretary, Francis Collingwsod, New York. Treasurer, John Bogart, New York.

The Engineers' Club, of Philadelphia, held its annual meeting on January 16th, with President Wilfred Lewis in the chair and 69 persons present, including six visitors. The president read the annual address, in which he referred to the notable growth in the prosperity of the club during the year, and proceeded to review the progress and activity of the engineering profession during the same period. The address dwelt particularly upon the rapid consumption of our stores of natural fuel, and held the view, announced by modern scientists, that these are nearer exhaustion than is popularly supposed. Railway construction for 1891 shows less mileage than for any year since 1885, but little more than 4,000 miles having been built. The increasing popularity of compound locomotives was touched upon, and it was remarked that while the Baldwin Works built in 1890 only three compounds out of a total of 916 they, built in 1891 82 compounds out of a total of 899, and they now have orders for some 40 new compounds. The address referred, of course, to the coming Columbian Exposition in Chicago, sketching briefly its proposed extent, and concluded by referring with satisfaction to the progress made in the construction of modern vessels for the navy, and in the manufacture of heavy ordinance. The board of directors reported a very marked increase in the attendance at the meetings. This increase has amounted to nearly 100% since the policy of issuing advance copies or abstracts of papers was adopted. Four numbers of the proceedings were issued during the year by the Publication Committee of the present board and a fifth early in January. Important improvements have been made in the clubhouse. Forty seven active and three associate members were admitted and the resignations of 24 active and 3 associate members were presented and accepted during the year. The total number of members of all classes at the end of the year was 421. Over $300 have been subscribed to the fund for establishing an engineering headquarters and engineering congress at the World's Fair in Chicago, in 1893. The treasurer's report showed a marked improvement in the financial condition of the club during the year. The tellers of election reported that 23 active members and 1 associate member had been elected, and that the officers elected for the coming year are: President, James Christie; vice-presidents, Frederick H. Lewis and Pedro G. Salom; secretary, John C. Trautwine, Jr.; treasurer, T. Carpenter Smith; directors, John E. Codman, George V. Cresson, Strickland N. Kneass, Wilfred Lewis, H. W. Spangler, David Townsend. A letter was read from A. J. Rudderow, Esq., announcing that the charter of the club had received the signature of the court, and the charter was thereupon accepted and ratified. An amendment to the by-laws, presented at the last meeting, and providing for the appointment of a nominating committee, was amended so as to restrict the duties of the committee to filling such vacancies as may occur in the ticket. The president was directed to appoint a committee to revise the constitution and by-laws, when, in the opinion of the board of directors, such appointment becomes necessary. Mr. Carl Hering moved the appointment of a committee to confer with the other engineering and technical societies of Philadelphia with regard to a plan for co-operation among these societies for the purpose of erecting a large building for their joint use. Mr. Rudolph Hering moved that the Committee on Land-locked Navigation appoint a sub-committee to co operate with similar committees of the Philadelphia Trades League and the New York Board of Trade and Transportation to further the project for a ship canal across the State of New Jersey. Both of these motions were deferred until the next business meeting. The secretary presented, for Mr. Richard T. Osborne, a lithographic view of the river front of Philadelphia as it appeared in 1761. The secretary announced the deaths of Messrs. R. H. Lee and Edward Nichols. A vote of thanks was extended to A. J. Rudderow, Esq., associate member of the club, for his services in obtaining its incorporation. After adjournment Mr. James Christie, president-elect, briefly addressed the members present, and urged united efforts in behalf of the club during his coming administration.

INDUSTRIAL NOTES.

The Holcomb-Brown Iron Company has been incorporated at Burlington, Ia. Capital, $350,000.

The Napier (Tenn.) Iron Furnace Company has increased its capital stock from $225,000 to $300,000.

The Ramona Iron and Steel Company, of Bellevernon, Pa., has been chartered with $60,000 capital.

Some 54 acres of land have been purchased by Andrew Carnegie at Duquesne, Pa., upon which an armor plate mill will be erected.

Park Bros. & Co., Limited, of Pittsburg, Pa., will increase the capacity of its Black Diamond Steel Works by the erection of two new mills.

The furnace of the Franklin Iron Manufacturing Company, at the Franklin Iron Works, N. Y., has been blown in after an idleness of about three months.

The Pioneer Tin Plate Company, of Joliet, Ill., has been organized with a capital of $125,000 to manufacture sheet iron and tin terne and galvanized sheets.

Milwaukee is to have a trade journal. It will be called *The Merchant and Manufacturer and Northwestern Trade Bulletin*, and will make its appearance February 1st. Bleyer Bros. will be the publishers.

The firm of Clay, Pepper & Register, manufacturing and contracting electrical engineers, of Philadelphia, Pa., has been dissolved by mutual consent. The business will be carried on as heretofore by Messrs. Pepper and Register.

The Pelton Water Wheel Company has recently furnished the Anaconda Mining Company, of Montana, with three wheels of capacity of 175 H. P. each, to run under a head of 130 ft., the power thus afforded to be used in an enlargement of its works.

The Henry R. Worthington Company filed articles of incorporation on the 20th inst., at Elizabeth, N. J., with a capital of $3,500,000, divided into 35,000 shares. The company will engage in the manufacture of hydraulic pumps and pumping machinery at Elizabethport and Brooklyn. The incorporators and stockholders are Charles C. Worthington, of Irvington; William A. Perry, of Bay Ridge; Horace G. Tarr, of Montclair; Josephus F. Holloway, of New York City, and Theodore F. Miller, of Brooklyn.

The Rapid Transit Commissioners, of New York, having found it impossible to obtain the consents of sufficient property owners along the line of the proposed route, have, in compliance with the Rapid

Transit Act, begun the necessary proceedings in the Supreme Court for the appointment of three commissioners to determine the question whether the proposed road shall be built or not. The notice of the application will be advertised in six newspapers to he designated by the court. The application will be made on the first Monday in February, when those opposed to the building of the road will have an opportunity to he heard.

The Berlin Iron Bridge Company, of East Berlin, Conn., is just completing a new machine shop for the Bridgeport Machine Tool Company, at Bridgeport, Conn. The building is made entirely of brick and iron, divided into two parts each 40 ft. wide, the total length being 96 ft. One portion is two stories high, the roof and floor being designed for light work, while the opposite half of the building is of the same height, but the second floor is omitted so that it may be used as an erecting shop. The erecting shop is controlled hy a traveling crane.

At its annual meeting, held on the 12th day of January, 1892, the Fort Scott Foundry and Machine Works Company, Fort Scott, Kan., changed the corporate name of The Fort Scott Foundry and Machine Works Company to that of The Walburn-Swenson Manufacturing Company, and the business will hereafter he conducted under that name. The capital stock of the company was also increased to $300,000. The works of the company and its principal offices will continue at Fort Scott, where they are conveniently located for their raw materials, and have so many competing and extensive lines of railway for the quick and cheap shipment of machinery to any points desired. The change of the name of this corporation has been deemed desirable for the reason that the principal business of the company has finally drifted into the manufacture of a few special lines in mining and sugar making machinery, and apparatus for special purposes, much of it being covered and protected by letters patent. The sales of a greater part of this machinery have been made in the East and South, through branch offices in New York and New Orleans, and the company has also made large shipments to foreign and far distant countries, where its machinery is often called and known by singular and entirely different names, often called by names not known to the company, so that it has finally been compelled to decide upon giving the business a name less limited and more concise in its meaning.

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 addresses from this office.

No charge will be made for these services.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning 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 goods of any kind.

GOODS WANTED AT HOME.

2,531. Sash machinery. South Carolina.

2,532. A hydraulic pump, hydraulic shape press, set of shapers 3×12 box screw, kettle, capacity about 20 gallons, mill to make smoking tobacco, and four knives. North Carolina.

2,533. Engine and boiler, complete smelter, and possibly concentrating works and cars for transportating ores, etc. Texas.

2,534. Full equipment for a factory for the manufacture of mechanical rubber goods, including calandars, grinders, washers, belt pressers, vulcanizers, rolls, etc. Tennesee.

2,535. A 30-H. P. engine, a 45-H. P. boiler, three 70-saw or four 60-saw gin stands, suction elevators, steam press, and corrugated iron house Texas.

2,536. A machine to crush hard stone from 16 to 160 mesh fine. It must he crushed, not pulverized, so as not to impair its cutting edges. The stone in the scale of hardness is about 8°. Pennsylvania.

2,537. Ten tons of 70-lb. rails, second hand. West Virginia.

2,538. A good pug brick machine, capacity 10,000 to 12,000 per day, to be drawn by two horses or mules. North Carolina.

2,539. Punch with shear attachment to punch tube holes up to 3 inches; also bending rolls. Tennessee.

2,540. An 18 or 20-in. swing lathe, 7½-ft. bed from center to center, a 24 in. swing back geared d power feed upright drill, a wood lathe, a saw, ower punch, an emery wheel, smith's tools, West Virginia.

2,541. An outfit for ginning cotton, and grinding corn; including an engine, boiler, 80 saw cotton gin, feeder, condenser, etc. Arkansas.

2,542. Corrugate Iron. Alahama.

2,543. Equipment for hrewery and ice factory. West Virginia.

2,544. A 20-H. P. saw mill complete; also a good planer and matcher. Virginia.

2,545. A lot of shoemakers' lasts. North Carolina.

2,546. A complete outfit of the lastest improved machinery for metallic paint mill, to grind "Red Fossil ores," ahout 20 tons daily capacity including engine and hoiler, mills, conveyors, dryers, with plans of the most conveniently arranged outfit. Alabama.

2,547. Complete outfit of the latest improved machinery for mining, washing, drying and handling land and river "pehhle" phosphate. The land "pebble" is imhedded in clay or mud. Capacity required ahout 400 tons gross material per day—yielding ahout 100 tons dried "pehble." Alabama.

2,548. A 40-H. P. engine, a 50-H. P. hoiler, and elevator for seed cotton, a cylinder cotton press, etc. Alabama.

AMERICAN GOODS WANTED ABROAD.

2,509. Catalogues, prices, and discounts of all kinds of machinery, and especially of technical novelties and oil vapor lights. Germany.

2,517. Fancy hrass work ornaments for brass hedsteads. Mexico.

2,518. A machine for bending ½-in., ¾-in. and 1-in gas piping. Mexico.

2,528. Sea Island cotton gins and presses. India.

2,529. Linseed, castor, ground wet crushing, and other oil making machines. India.

2,530. Machines for pressing or forming oil cake. India.

GENERAL MINING NEWS.

We are indebted to the *Iron Ore* for the following tahle, showing the production of the Lake Superior iron mines in 1891. The lake shipments from the Marquette Range were ahout equally divided between Escanaha and Marqnette, 1,154,645 tons from the former and 1,056,027 tons from the latter place. With the exception of 177,886 tons shipped from Gladstone the Menominee Range sent its ore via Escanaba. The Gogebic Range shipped 423,697 tons via Escanaha; 337,608 tons of this amount was from the Norrie mine, and the halance, 1,261,658 tons, via Ashland. The Vermilion Range shipments were of course via Two Harbors. The all rail shipments were mostly to interior furnaces, and since the close of navigation, to Milwaukee and Chicago. The amounts are given in tons, 72,240 lhs.

MARQUETTE RANGE.	By all rail.	Total tons.
American	19,125	21,604
Angeline	26,594	241,605
Buffalo	34,787	479,509
Cambia	9,727	34,662
Champion	.....	133,413
Cleveland	43,378	221,788
Iron Cliffs Co	25,400	278,270
Cheshire	.....	7,301
Dexter	4,135	5,448
E. New York	5,231	50,293
Fitch	14,938	15,093
Gr'nd Rapids	5,059	9,362
Humboldt	.....	19,879
Imperial	8,112	18,552
Jackson	733	97,979
MENOMINEE RANGE.		
Aragon	34,140	96,829
Beta	.....	1,400
Chapin	60,245	488,749
Com'nw'lth.	1,860	134,982
Cyclops	.....	10,599
Dunn	789	162,721
G't W'stern.	.....	62,464
Florence	.....	48,806
Groveland	1,049	1,049
Hollister	.....	1,057
Hamilton	.....	58,197
Hemlock	23,921	35,531
Iron River	.....	59,345
Ludington	9,081	141,303
Mansfield	24,082	49,836
Millie	.....	5,889
GOGEBIC RANGE.		
Ashland	16,514	267,439
Aurora	928	83,554
rotherton	12,960	46,574
Carey	12,520	121,186
Eureka	1,167	13,907
Federal	6,778	6,778
Germania	.....	32,600
Iron Belt	.....	1,506
Montreal	13,974	70,107
Mount Hope	.....	105,667
Norrie	63,526	758,572
Pabst	4,187	130,226
Palms	.....	32,227
Buby	.....	913
Sunday Lake	10,483	64,902
Sec. 33 Bes'r.	.....	38,576
BY RANGES.		
From Marquette		2,511,395
From Menominee.		1,843,326
From Gogebic		1,848,721
From Vermilion		891,539
Total tons		7,094,981

MARQUETTE RANGE.	By all rail.	Total tons.
L'ke Superior	3,655	308,831
Lillie	15,280	19,551
Lucy	15,019	27,683
Marquette	6,236	16,802
Michigamme	1,059	23,169
Negaunee	.....	64,218
Prout	.....	4,412
Republic	34,980	191,127
Riverside	6,783	6,783
Saginaw	2,351	4,320
Volunteer	92	92,699
Winthrop	15,869	122,042
Total	300,723	2,511,395
MENOMINEE RANGE.		
Monitor	18,774	45,000
Mastodon	.....	45,370
Nanaimo	2,200	13,200
Norway	.....	4,089
Paint River.	7,289	45,435
Pewabic	.....	64,507
Shafer	300	70,770
Sheridan	500	7,137
Vulcan	.....	78,967
Walpole	1,042	3,895
Youngstown	.....	3,705
Lincoln	.....	1,813
Curry	.....	100,681
Total	185,212	1,843,326
GOGEBIC RANGE.		
Tilden No. 1.	.....	23,194
Tilden No. 2.	.....	5,221
Comet	.....	10,144
Colby	9,619	9,619
Hennepin	.....	15,759
Atlantic	.....	.....
Superior	10,710	10,710
Total	163,366	1,848,721
VERMILION RANGE.		
Minn. I'n Co.	.....	517,570
Chandler	1,240	373,969
Total	1,240	891,539
BY PORTS:		
From Escanaba		3,058,590
From Marquette		1,056,027
From Ashland		1,261,658
From Two Harbors		890,299
From Gladstone		177,866
By all-rail		650,541
Total tons		7,094,981

ALASKA.

ALASKA TREADWELL GOLD MINING COMPANY.—The statement of this company for the last month (December is as follows: Tons of ore milled, 19,000; ton of sulphurets treated, 472; number of days m ran, about 30; bullion shipments, $51,800. Of llion $14,875 came from sulphurets. The gross xpenses for the month were $29,250.

ARIZONA.

PIMA COUNTY.

(From our Special Correspondent.)

The Quijotoa camp is livelier now than at any time since 1884, the 20 stamps of the mill running to their full capacity on Peer ore. The next ores to be worked are the Peerless, Crocker, Weldon and Central, in the order named. Much of the ore is low grade, hut a portion of it runs from $500 to $600 per ton. The mill has been running since December 18th, and the clean-up shortly to be made will, it is expected, reach $15,000.

PINAL COUNTY.

MAMMOTH GOLD MINES, LIMITED.—During December the mill crushed 2,790 tons of ore, producing hullion valued at $18,540. The expenses for the month were $11,400. Capt. Johnson, superintendent of the mine, reports that at the cross-cut at the 600-ft. level the vein is 37 ft. wide, averaging $9.50 per ton in value.

SILVER KING MINING COMPANY.—At the annual meeting of the stockholders of this company, held in San Francisco on the 12th inst., 36,275 shares were represented and the following officers elected: Thomas B. Phehy, president; George C. Hickox, vice-president, and J. W. Pew, F. A. Berlin and M. A. Jackson, directors. J. W. Pew was re-elected secretary. The financial statement shows a cash balance on hand of $1,170.24. Mr. W. A. O. Paul, of 52 Broadway, was made transfer agent in New York in place of Mr. E. R. Grant.

The financial statement for the year was as follows: *Receipts*—Cash received from former secretary, $126.54; sale of mine supplies, $14.25; sale of mill supplies, $55.75; assessment No. 6, $12,770.40; assessment No. 7, $8,789; sale of ore, $4,294.04; general, $20.02; total, $26,070. *Disbursements*—July 12th, 1891, overdraft at bank, $768.03; superintendent's drafts, $350.52; mine labor, $11,412.75; mine supply, $495.25; mine lumher and fuel, $2,128.56; mine freight, $130.54; mine expense, $111.90; mine stable, $350.69; mill labor, $594.50; mill supply, $128.06; mill freight, $15.63; assay supplies, $12.40; traveling expenses, $123; expense account, $1,823.60; interest, $71.40; insurance, $480; taxes, $806.21; New York agency, $535.82; delinquent stock expense, $4,300.90; legal expense, $250; cash on hand, $1,176.24; total, $26,070. Superintendent Champion's report was as follows:

Upon assuming charge of your property in Arizona, I found that my predecessor had been sinking and drifting in and about the Bilk shaft up to March, 1891, without finding anything of value, and had then stopped all work below the 1,000 level. Crosscutting on the 800 and 900 levels showed some ore, hut not enough to pay for extracting it. When I took charge in August last, the first work done under my orders was in a shaft 140 ft. deep, near the crossings of the vein. At the 70 level I ran a drift northeast 120 feet under the open pit. From this drift crosscuts have heen made north 95 ft. and south 80 ft., all in vein matter and cutting seams and bunches of good ore. The next work done was the cleaning out of the open pit, which soon exposed a large quantity of good ore, assaying from $30 to $500 per ton. I intend to start up the concentrators and mill as soon as the machinery can he put in running order. Twelve tons ore, estimated at $250 per ton, are now lying at Tempe, and so soon as I can make up a carload will be shipped for sale or reduction.

CALIFORNIA.

The total receipts of coal in California during 1891 exceeded those of any previous year, says J. Stewart in the *Mining and Scientific Press*. The following is a statement of the imports of coal into San Francisco in 1890 and 1891:

	Tons. 1891.	Tons. 1890.
Australian	280,370	153,390
Great Britain	188,790	38,570
Eastern	36,550	23,700
British Columbia	466,770	329,640
Port of Seattle	169,540	218,700
Port of Tacoma	194,400	183,070
Other Mines	63,800	71,050
Totals	1,400,220	1,018,120

The imports of coke into San Francisco were 35,150 tons. The deliveries of coal at San Pedro were about 75,000 tons, and at San Diego 50,000 tons.

(By Telegraph.)

SAN FRANCISCO, Jan. 22.—The State Mining Convention has adopted resolutions setting forth the great loss of mineral wealth to the State hy legislation prohibiting hydraulic mining, and resolving that the best method of reviving the same is for the United States Government to construct restraining barriers in the Sierra Nevada mountains of sufficient strength and capacity to impound all débris, thus removing the objections to that method of mining. The resolutions recommend the improvement of the Sacramento and San Joaquin rivers, and ask that a committee of three be sent to Washington to assist in securing the desired legislation. A State Mines Association was also formed, with J. C. Neff, of Placer County, as president

(From our Special Correspondent.)

The mining assessments falling delinquent this month amount to $233,500, divided as follows: California, $4,000; Arizona, $10,000; Oregon, $1,250, and Nevada, $218,250.

LOS ANGELES COUNTY.

(From our Special Correspondent.)

A large ledge of bituminous rock has been discovered just within the city limit of Los Angeles, on West Seventh street. Experts have pronounced it equal to the bituminous rock of San Luis Obispo or Santa Cruz. Near this ledge is a large deposit of brea.

MONO COUNTY.

(From our Special Correspondent.)

BULWER CONSOLIDATED MINING COMPANY.—There has been drawn from the main ore chute and shipped to the mill 140 tons of ore. The stopes above the north drift, 150 ft. level, are yielding good grade ore. The ore body averages 2½ ft. in winter. The mill is running steadily, the average battery sample for the week being $41.38; tailings, $13.61.

SISKIYOU COUNTY.

The Yreka *Journal* says: The quartz, hydraulic and placer miners are very hopeful of success this winter and during next spring and summer in mining operations, as the snowstorms already will be the means of supplying a great amount of water in the various streams and ditches for filling sluices and turning the wheels of the quartz mills. We have had more than double the amount of snow already than during last winter, with a likelihood of considerable more before next March, or else rain, which is just as good.

COLORADO.

LAKE COUNTY.

(From our Special Correspondent.)

ELK MINING COMPANY.—The main working shaft will, without doubt, soon be sunk, as a drill is now in operation to determine the extent and drift of a fine body to oxidized ore lately discovered in the workings to the north of the shaft. There are still considerable quantities of good ore standing in the older bodies, and the shipments average about 50 tons a day.

FIRST NATIONAL.—On the Printer Boy side of Iowa gulch is located the First National mine, and a tremendous amount of good work has been done in, and from, the main working shaft, disclosing large bodies of sulphide of iron ores, carrying some lead, but of so little silver value that concentration is necessary before shipments can be made to a profit. Water also bothered a great deal, so the property has lain idle for some time.

A new shaft has been sunk on the south end of the claim, however, in which the indications are such as to induce the present operators to furnish the shaft with a fine plant of machinery, and to continue the development. The late strike on the Frank, where some 5 ft. of oxidized ore has been disclosed at a point about 22 ft. east of the shaft at the 80-ft. level, has doubtless had a great deal to do with the continued working of the First National.

GREAT O'SULLIVAN.—What promises to do a great deal for the ultimate development of Rock hill is the work now going on in the mines. About 300 ft. from the surface the shaft cut into a channel in the blue carboniferous limestone, which channel had a width at that point of about 3 ft. The drift was carried down a further 100 ft., the channel widening as depth was gained, until at that depth it had an average width of 4½ ft. Drifts were then started north and south in it, and at a point about 15 ft. from the shaft to the south an upraise is now being made, which raise is now about 45 ft. above the drift, and in fine looking stuff. Meanwhile, the north drift has been driven out 75 ft., and an upraise has gone up 75 ft., with about the same result.

GREY EAGLE MINING COMPANY.—The Penrose shaft is at last through the bad ground, and sinking has been resumed. It is now down about 470 ft. Oil has been substituted for coal as fuel, and all of the boilers are now fitted with the patent burners.

MAHALA.—This mine has not been shipping, pending the introduction of a cage in the shaft, but this having been successfully accomplished, the shipments have been resumed, and now average about 100 tons a day. The ore still maintains its normal value, and without doubt this property, including the portion of the Agassiz, of the Wolftone Mining Company, leased to the Mahala people, will make a showing in 1892 that will astonish even Leadville mining men. The water does not increase in volume, and is easily handled by the present efficient plant.

STAR OF HOPE MINING COMPANY.—The Bohn shaft of this company is on the same contact as the Penrose, and consequently is met with the same difficulty. It has been successfully overcome, however, by placing 2-in. planks flat, one upon another, spiking them together, and filling in behind with bales of hay. The latter takes up the pressure from the running ground; the shaft is a three-compartment one, and the two partitions are built of solid 10-in. square logs, thus making the shaft about as solid as it can possibly be made.

TERRIBLE MINING COMPANY.—The Ward shaft of this company is being sunk in order to catch the ore body on its dip, and has now attained a depth of 380 ft. North of this shaft the Lounsbery shaft has been fitted with a fine plant of machinery, and a drift is now going out to the south to catch the same ore body on its rise to the north and to make connections with the Ward shaft workings for air and safety. This ore streak is a most important one, and from it a tremendous amount of excellent oxidized ore has come, with large blocks still to follow. No attempt to stope from these bodies, however, is being made while this development is proceeding.

OURAY COUNTY.

The Red Mountain Railway has been blocked with snow since December 24th, and none of the mines along its line have been able to make shipments since that time. For the same reason the outputs of the New Guston Company, Limited, Yankee Girl Silver Mines, Limited, and American Belle Mines, Limited, were much below the average in December. The Yankee Girl mines are reported to be looking very much better than a few months ago, and the shares have risen in London, being quoted last week at 14s. 3d.@14s. 9d.

YANKEE GIRL SILVER MINES, LIMITED.—It is reported that a rich strike has been made in the eleventh level of the Yankee Girl mine, which, according to local papers, promises to be the best ever made in the mine.

PITKIN COUNTY.

BEST FRIEND MINING COMPANY.—Late developments in the Best Friend mine are encouraging, says the Aspen *Times*. Manager Casey has run a drift southerly from the bottom of the incline to develop that portion of the mine. The drift was below the line of the main ore body, but a few days ago he upraised a few feet, and opened into a body of very high grade mineral, three feet of which average about 365 oz. silver per ton.

FLORIDA.

COLUMBIA COUNTY.

(From our Special Correspondent.)

PORT WHITE PHOSPHATE COMPANY.—This company is incorporated in the State of Missouri and is successor of the Sooysmith Phosphate Company, of New York. E. B. Robinson, of Kansas City, is its president, and R. G. Perrin its manager. Its principal office is in Kansas City. The capacity of its plant will be 50 tons a day.

MARION COUNTY.

(From our Special Correspondent.)

When the erection of all the phosphate plants in the Anthony region is completed there will be ten companies operating within an area of only a few square miles. Following are the names of these companies: Phosphate Company, of France; Plate Rock, Deacon, Stranathan, Lindner, Maryland, Excelsior, Ohio, Standard and Royalty. The first two named have duplicate plants, one belonging to each near Anthony, and the others near Sparr. The Deacon Company has been engaged thus far in grinding phosphate rock for local use. The Excelsior and Royalty companies have leased the land that they will work at the price of $1 a ton royalty on all the phosphate shipped. To operate these plants will require the labor of several hundred men, and the daily output of rock ready for shipment, at a low estimate, will aggregate five or six hundred tons.

IDAHO.

At a recent meeting of the mine owners in the Cœur d'Alene country, at which all the leading men were represented, the matter of freight rates to Omaha and Denver was discussed. It was decided to notify the railroads that unless the old freight rates were restored the mines would close. Representatives have been appointed to visit Omaha and St. Paul, and to see the representatives of the railroads. The new rate of $2 per ton advance over the old rate is considered exorbitant. If no satisfactory conclusion can be reached the mines will shut down.

ELMORE COUNTY.

ELMORE GOLD, LIMITED.—Mr. G. A. McCormick, superintendent of the mine, reports that good progress is being made in sinking the shaft. The Vishnu mine is improving. During December 275 tons of ore were milled, which produced bullion valued at $2,350.

SHOSHONE COUNTY.

BLACK DIAMOND.—A large body of ore of good quality has been found in the 230-ft. tunnel which assays from 35 to 85 ounces of silver. Work will be pushed through the winter.

SAN FRANCISCO & HELENA MINING COMPANY.—A large vein of clear galena has been struck in the Badger mine at the terminus of the 100-ft. tunnel. The net profits of the company for the past month was $25,000.

SIERRA NEVADA MINING COMPANY.—The suit for damage by the owners of the Apex vs. Sierra Nevada Mining Company for $300,000 for ore taken by the latter company has been decided in favor of the defendants. The suit was begun in 1889, both parties admitted that there was a vein but differed as to the outcrop and direction. Work will now be pushed, and development of this valuable property be continued this season. The court held that the plaintiffs not owning the apex of the vein, did not own the vein itself, and the defendants had the right to follow the vein.

KANSAS.

CHEROKEE COUNTY.

During the week ending January 16th the output of ore from the mining districts of Galena and Empire City was: "Rough ore, pounds milled, 543,350; rough ore, pounds sold, 245,260; zinc ore, pounds sold, 540,000; lead ore, pounds sold, 22,330. Sales aggregated a total value of $5,960.

MICHIGAN.

COPPER.

CALUMET & HECLA MINING COMPANY.—According to the Marquette *Mining Journal* there are only 11 furnaces out of 16 in service at this company's smelting works. These produce about 100 tons of refined copper per day. The remainder of the mineral is being stacked for transportation to Buffalo for treatment at the opening of navigation.

QUINCY MINING COMPANY.—Supt. S. B. Harris, of this company, reports by letter that the No. 6. or Pewabic shaft, was retimbered down to the 25th level on December 21st, and the water was pumped out nearly to the 32d level. The additional stamping facilities will increase the capacity of the Quincy two-thirds if rock can be supplied in sufficient quantity. Just when the two new heads will be available cannot be told, but it will very likely be during the spring.

At a director's meeting held on the 19th inst. a dividend of $4 was declared, payable February 23d to stock of record January 27th; it being on 50,000 shares of stock, aggregates $200,000. The last dividend was of $5 per share on 40,000 shares paid in August, 1891.

IRON—GOGEBIC RANGE.

RUBY MINING COMPANY.—The Keweenawian Association, successor to the Lake Superior Ship Canal Railway & Iron Company, has begun proceedings against this company for the possession of its lease and something like $20,000 back royalty said to be due.

IRON—MENOMINEE RANGE.

HAMILTON-LUDINGTON.—The inflow of water into these mines, mentioned in our issue of the 16th inst, does not seem to have grown in volume, while the facilities for unwatering the properties are being increased. It is estimated that the flow into the Ludington is 1,500 gals. per minute, and that this amount can be handled by the bailers, the Cornish lift and other pumps. This capacity will soon be increased 1,000 gals. per minute. The water has reached a point 30-ft above the 8th level. Mining is being carried on in the 3d and 4th level of "B" shaft, and also at points in the so called "old mine" to the extent of a 250-ton daily production.

At the Hamilton No. 2 shaft the hoisting plants are being rapidly placed. Two bailers will be used. They are 40 ft. in length and have a combined capacity of 5,600 gals. per minute. Bailers are also being rigged for No. 1 shaft.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

Joplin, Jan. 18.

Last Saturday closed the dullest week in the lead and zinc mining industry that has been recorded in the past two years. The week opened with extremely cold weather, which caused almost all the small operators to close down, as the pumps and wash places were frozen up; thus the water in the mines soon drove the ground men out. Almost all of the large companies, having their ore dressing plants enclosed, worked full time but made a light output, and as there was but little surplus ore on hand in the entire district the ore buyers were compelled to advance the price of zinc, which ruled strong at an average price of $22 per ton, being an advance of $1 per ton over the previous week. Lead ore was on the decline and closed at $23 per thousand.

The output of the mines for the past three weeks has been as follows:

January 4.

Joplin mines, 985,930 lbs. zinc ore and 383,270 lbs. lead; value, $19,360.

Webb City and Carterville mines, 1,947,620 lbs. zinc ore and 102,070 lbs. lead; value, $22,362.

Zincite mines, 149,980 lbs. zinc ore and 750 lbs. lead; value, $1,646.

Lehigh mines, 51,160 lbs. zinc ore; value, $588.

Carthage mines, 389,500 lbs. zinc ore; value, $4,730.

Galena, Kan., mines, 896,410 lbs. zinc ore and 216,840 lbs. lead; value $10,120.

Districts, total value, $58,806.

January 11.

Joplin mines 1,187,365 lbs. zinc ore and 218,350 lbs. lead; value, $17,598.55.

Webb City mines 1,472,350 lbs. zinc ore and 39,110 lbs. lead; value $16,181.35.

Carterville mines 1,454,260 lbs. zinc ore and 57,830 lbs. lead; value $16,623.75.

Zincite mines, 30,400 lbs. of zinc ore and 2,450 lbs. lead; value, $400.75.

Lehigh mines, 87,400 lbs. zinc ore; value, $1,047.65.

Carthage mines, 522,130 lbs. zinc ore; value, $6,021.

14Galena, Kan., mines, 729,000 lbs. zinc ore and 9,050 lbs. lead; value, $10,061.

Districts, total value, $67,914.05.

January 18.

Joplin mines, 491.680 lbs. zinc ore and 98,500 lbs. lead; value, $7,674.

Webb City mines, 472,990 lbs. zinc ore and 29,740 lbs. lead; value, $5,886 90.

Carterville mines, 855.030 lbs. zinc ore and 28,050 lbs. lead; value, $10.050.50.

Zincite mines, 402,010 lbs. zinc ore; value, $4,603 10.

Lehigh mines, 76,480 lbs. zinc ore; value, $898.

Oronogo mines, 87,380 lbs. zinc ore; value, $873 80.

Galena, Kan., mines, 540.000 lbs. zinc ore and 23.330 lbs. lead; value, $5,960.

Districts, total value, $36,946,30.

The Snyder Bros. mines have been holding their ore for some time, and now have not less than 450 tons stored in their bins.

J. M. Lee & Co. have been prospecting and developing a property in what is known as Possum Hollow for some time, and now have opened up a face over 30 ft. of free zinc ore, in which they are stoping. The ore is of a very high grade, and easily separated from the gangues.

Cooley & Elmore are putting up a 100 ton concentrating plant for the Cherokee Mining Company on the Conner land, south of Carterville.

The Missouri Zinc Company, operating on the Dougherty land in the southwest part of Joplin, is now opening up a fine zinc property and last week turned in 34,770 lbs. of zinc ore.

MONTANA.

JEFFERSON COUNTY.

ELKHORN MINING COMPANY, LIMITED.—During the month of December the mill worked 30 days and crushed 1,097 tons of ore. Bullion shipments amounted to $41,065. There were also shipped 297 tons of smelting ore valued at $23.287, making the total production of the month $64.352. The total expenses of the month were $25,650. The estimated profit for December, after the payment of all taxes and charges for the year 1891, is $38,702.

LEWIS AND CLARKE COUNTY.

MONTANA COMPANY, LIMITED.—The secretary of this company informs us that the total output for December was $65.400, and the working expenses for the month $44,500. The directors have informed the shareholders that experiments recently made in the treatment of tailings have given encouraging results. In addition to 7,211 tons of ore crushed in the mills during December, 1,400 tons of tailings were treated, yielding $7.600 at a cost of $3,500, which figures are included in the above return.

NEVADA.

ELKO COUNTY.

The following are the latest letters from superintendents of Tuscarora mines:

BELLE ISLE MINING COMPANY.—North drift, 150 ft. level, has been advanced 5 ft., with no change. Southwest drift, from Williams' cross-cut, extended 13 ft. Intermediate drift, below 350 ft. level, on No. 2 vein, extended 4 ft., showing very fine ore. The stopes on Nos. 2 and 3 veins are without any change and are yielding as usual.

COMMONWEALTH MINING COMPANY.—Fourth level: Joint raise has been put up 20 ft. cutting seams that indicate the proximity to the footwall of the vein.

DEL MONTE MINING COMPANY.—Second level: West drift from No. 1 joint raise in 53 ft., with seams of low-grade ore in the face. The stopes opened up on the line have exposed good ore two ft. wide. Third level: Work has been resumed in No. 1 north drift. North drift from No. 3 raise extended 9 ft., still showing bunches of ore. West drift from same raise advanced 18 ft., a strong flow of water coming in the face. Extracted 4 cars first-class ore, assaying $260 per ton, and 38 cars of second class; assay, $33 per ton.

NAVAJO MINING COMPANY.—A drift started on a vein running south from the 350 cross-cut has been advanced 11 ft., giving some very fair assays. No. 2 winze below 350 level sunk 5 ft. and was stopped. The stopes are producing as usual.

NEVADA QUEEN MINING COMPANY.—Second level: No. 1 south drift advanced 13 ft.; face in vein porphyry. No. 2 north drift extended 22 ft., showing a seam of ore in the face. Fourth level: West cross-cut raise advanced 19 ft. in the vein. Joint raise from south drift has been put up to 20 ft. This raise will reach the vein at about 25 ft., and 90 ft. from second level south drift.

NORTH BELLE ISLE MINING COMPANY.—No. 3 north drift, 400 level, advanced 16 ft., showing some good ore in the face. No. 1 intermediate winze from intermediate sunk 7 ft., showing a strong vein of high grade ore. No. 4 north drift, 500 level, advanced 19 ft., showing some very fine ore. The stopes are yielding as usual.

NORTH COMMONWEALTH MINING COMPANY.—Second level: Winze from second level sunk 30 ft. in porphyry. West drift from winze chute in 15 ft.; seam of good ore 4 in. wide. East drift from same point advanced 22 ft., 2½ ft. of ore; average assay, $166 per ton. Hoisted 7 cars first-class and 43 cars second-class ore.

LANDER COUNTY.

PITTSBURG CONSOLIDATED GOLD MINES, LIMITED.—Bullion shipments for December were vrlued at $3,100. The total cost of mining and milling was $5,100.

STOREY COUNTY—COMSTOCK LODE.

(From our Special Correspondent.)

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

Mine.	Tons extracted.	Tons milled.	Assay Values.— Jan. 9.	Jan. 2.
Belcher	400	400	$31.33	.....
Con. Cal. & Va	994	980	22.95	$22.36
Challar	.....	.....	.....	18.91
Kentuck	117	117	.....	.....
Overman	*481	490	17 56	.....
Savage	†775	675	19.70	20.00
Yellow Jacket	‡....	....	.....	.....

*Car samples, $20.39. †Cars.

‡ About 35 tons of ore are being shipped to the mill.

BELCHER MINING COMPANY.—The raise from the north lateral drift, 300 level, has been extended to and connected with the bottom of the 300-ft. level stope. The development on the 1,300-ft. level bids fair to assume proportions of magnitude. Two sets have been opened out to the north, and the pay streak has widened to 3 ft. on the fourth floor and to about 6 ft. on the sixth floor. It lies on a quartzite footwall with barren quartz over it and is lying flat. The pay is of good milling grade with spots of rich ore. At the point where the strike has been made is a large body of unexplored ground, westward of the old workings, and there is consequently plenty of room for an important ore body to be uncovered.

BULLION MINING COMPANY.—The annual meeting of the company was held this week, when 70,000 shares were represented and the following officers elected: T. Cole, president; T. Anderson, vice-president; and C. Hirschfeld, J. N. Souther and C. W. Kellogg, directors. R. R. Greyson was appointed secretary and A. C. Hamilton superintendent. The financial statement of the secretary showed a credit of $329.15.

CROWN POINT INCLINE.—The flow of water through the drill holes in the bulkhead has kept the pumps running to their full capacity. The sinking pumps are being started this week, when the water will be lowered enough to bore another hole through the bulkhead. The surface of the water in the Belcher incline is now 131 ft. below the floor of the 1,600-ft. station. At the Overman mine the surface of the water in the vertical shaft is 48 ft. below the 1,400-ft. station.

SAVAGE MINING COMPANY.—The bullion yield for the week was $9,315. The northwest drift, 1,400-ft. level, was extended 20 ft., and connected with No. 2 west crosscut from the old north drift. Some ore of good quality is showing in it. On the 1,450-ft. level fair grade ore is being stoped out. On the 1,500 ft. level sill floor sets are being put in the ore body, which is of average grade. A joint north drift has been started with the Gould & Curry Company on the Sutro Tunnel level. This drift starts in the ledge at a point where the Sutro Tunnel intersects the Comstock lode, and will be continued, following the course of the lode.

NEW YORK.

NEW YORK TRANSIT COMPANY.—The New York Transit Company, capital $5.000,000, filed a certificate of incorporation with the Secretary of State of New York on the 13th inst. The company is formed to own and operate for public use lines of pipe already constructed from the town of Olean, in Cattaraugus County, through the counties of Cattaraugus, Allegany, Steuben, Tioga, Broome, Delaware, Sullivan and Orange, thence through the State of New Jersey to the Hudson River and New York Bay, a distance of about 377 miles; also lines of pipe already constructed from the town of Olean through Cattaraugus and Erie counties to the city of Buffalo; also to construct and operate for public use another line of pipe alongside of those already constructed, and such branch lines as may be found necessary for connecting the main lines with petroleum wells. The company is to continue 50 years. The directors and principal stockholders are Henry M. Flagler, William Rockefeller, Benjamin Brewster, Henry H. Rogers, John D. Archbold, Daniel O'Day, of New York City; John Bushnell, of Plainfield, N. J. The principal business office of the company will be in New York City.

PENNSYLVANIA.

COAL.

President-Judge Rice, of Luzerne County court, on the 14th inst. denied the application of the Lehigh & Wilkesbarre Coal Company for an injunction to restrain the Delaware & Hudson Canal Company from flooding the Conyngham mine, which has been on fire for the past six months. The Lehigh Company claimed that the weight of water would break the pillar between the two workings, thereby destroying its mine.

Mine Inspector Duncan states that in his district, the Connellsville region, including Fayette and Somerset counties, in which there are 66 mines, there were 21 fatal accidents during 1891, 20 of which occurred in the mines of Fayette and 1 in those of Somerset. During the year there were also 36 accidents not fatal, the large majority of which happened in Fayette's mines. As compared with 1890 this is a much smaller fatality. The report for that year shows that there were 52 deaths from fatal accidents. The were also 37 non-fatal accidents reported and investigated by the inspector, all occurring in the mines of Fayette County.

LEHIGH VALLEY COAL COMPANY.—The operations of the Lehigh Valley Coal Company for the year ending November 30th, 1891, show 1,385,463 tons shipped from collieries owned by the company, against 1,464,509 tons in 1890; and 3,247,622 tons from tenants of the company, against 2,449,562 tons during the previous year. On this subject President Wilbur said in his annual report: "The policy of surrendering the coal company's tonnage for that of tenants and individual operators is a costly one; so much so, that the slight increase for the year in the price of coal was more than offset by the greater cost of production, due to operating the collieries at less than half time. The immediate remedy for this is to close down more of the coal company's mines and operate the remainder fuller time. Orders have been given to that effect. The tonnage of anthracite coal and miscellaneous freight shows a gratifying increase, amounting, after deducting the loss of 120,511 tons in bituminous coal and coke, to 1,369,826 tons. The increase in miscellaneous freights carried one mile was nearly six times as great as the increase in ton miles of anthracite coal and earnings therefrom in the same ratio, owing to the restriction on production of anthracite coal during two-thirds of the year.

PHILADELPHIA & READING COAL AND IRON CO.—On the 18th inst. the Burnside coal breaker, at Shamokin, belonging to this company, was destroyed. It was ignited by a spark blown from a carpenter's lamp into a roll of waste. A terrific wind assisted in the spread of the flames. The fire was kept back from the mouth of the slope, from which all the miners escaped. The structure was one of the best in the region.

STONE.

The annual meeting of the slate operators of the Slatington, or Lehigh, region was held on the 15th inst. at Slatington, Pa. The leading operators present were: Henry Kuntz, of the Slatington Slate Company; David McKenna, Samuel Caskie, A. P. Berlin, of the Washington Slate Company; E. D. Peters, of the Union Slate Works; R. G. Pierce, of the Carbon Slate Company; W. H. Weinsheimer and O. A. Miller, of the Saegersville Roofing Slate Company; M. C. Hirsch, of the Consolidated Lehigh, and others. Prices for the ensuing year were fixed. This region being the most important producer of slate, the action of the meeting will have an important bearing upon the trade.

IRON.

Jones' Mines, one of the oldest mines in Pennsylvania, are to be abandoned. They received their name from David Jones, a Welsh ironmaster, who purchased in 1735 about one thousand acres of land in Carnarvon Township, Berks County, upon a part of which tract the mines were worked. Jones made a fortune out of them for himself and his descendants. Until recently a large force of men were employed at the mines, but the expense of following the iron ore is considered too great in the present condition of the iron trade, and the pumps and other machinery are to be withdrawn and the shafts allowed to fill with water.

UTAH.

SALT LAKE COUNTY.

Below will be found the list of mines shipping from the Bingham station, and the amount of ore shipped by each during the year 1891, as furnished the Bingham *Bulletin* by the Rio Grand Western Railroad Company:

Mine.	Tons.	Mine.	Tons.
South Galena	14,720	Live Pine	114
Highland	4,900	Tewaukee	199
York	3,448	Eckman	143
Petro	2,580	Benton	598
Old Telegraph	5.358	Peabody	249
Rough & Ready	617	Wella	112
Nast	303	Stewart No. 2	126
Spanish	862	Markham	133
Niagara	228	North Last Chance	363
Saturn	138	Miscellaneous	1,742
Neptune	112		
		Total	37,055

Properties shipping less than 100 tons are included in miscellaneous shipments. The numerous properties shipping from the Lead Mill station are not included in the above list.

TOOELE COUNTY.

HADLEY & HUDSON MINING AND MILLING COMPANY.—This company is about to be incorporated by Otto Hudson, H. M. Hadley, Martha J. Hudson, C. G. Gardner, G. Sorenson and J. R. Peterson. The property of the company consists of the Cleveland, Hattie, Golden Treasure, Iron Mountain, Blaine, Mammoth and Ethel claims, in Santaquin mining district, and the Hudson and Sitting Bull claims. The property in Santaquin district is considered one of the best discoveries of the past year. The shaft on the Cleveland lode is down 80 ft., and the bottom is in an ore body 18 in. wide that dips to the northeast, and assays 10% to 22% lead, 27% to 45% iron, and 5 to 50 oz. in silver. The company, it is claimed, will begin regular shipments from this property shortly. On the Blaine lode there is a tunnel 100 ft. long and in the face it has cut into a body of iron ore 10 ft. wide that runs 49.8% iron and ½ oz. in silver. Shipments of 20 tons daily can be made from the Blaine, and contracts are now being made with the Mingo smelter for the purchase of the ore. On the Mammoth lode, adjoining the Blaine, there is a big outcrop of copper ore. A tunnel has been driven in

on the ledge for a distance of 50 ft. where the vein is two feet wide and according to the Salt Lake *Stock Exchange Journal*, samples taken from it assay 7% copper, 4 oz. in silver, and $1 in gold. On the Blaine lode there are now 200 tons of ore on the dump and 2,000 more in sight.

WASHINGTON.

(From our Special Correspondent.)

Governor Ferry has appointed the following board to examine the candidates for inspectors of coal mines, in accordance with the law passed by the last legislature relating to proper ventilation and safety of coal mines: Oscar Huber, Spokane; Alexander Ronald, Roslyn; John W. Richards, Roslyn; Thomas Ismay Bucoda; Morgan Morgans, Black Diamond; D. T. Davies, Carbanado, and Jas. Williams, Reuton. The law provides that the Goveruor shall, upon recommendation of the board, which must be composed of three practical coal miners, three competent coal operators, and one mining engineer, appoint two inspectors of coal mines, who shall hold office for a term of four years, the first term to begin on first Monday in February, 1892, and whose compensation shall be $1,500 per year and mileage. It is the duty of each inspector to examine every mine in his district not less than once every three months, and he will have authority to order such improvements in the mines as he may deem necessary for the safety of the miners. The State is divided into two inspection districts, the first including the northern portion of the State and the second the southern.

OKANOGAN COUNTY.

(From our Special Correspondent.)

BLACK BEAR & WAR EAGLE.—The stamp mill on this mine has shut down for the winter on account of the water freezing in the creek. Work, however, will be prosecuted in the mine through the winter and the ore supply be increased while waiting for the stamps to start up. The spring will find this mine very active, as the stamping capacity will be doubled.

LAKEVIEW.—The development work commenced by Mr. Hugh Matheson a short time ago has met with happy results. The report has just come in that on the 65 ft. level a five-inch streak of rich chloride and black sulphuret ore has been struck. Some twenty men were put to work a short time ago to develop the mine and carry out the bond contract, and it was on the extension of the tunnel to the juncture of the ledge that the rich ore was found.

PALMER MOUNTAIN MINING AND MILLING COMPANY.—Work will shortly begin on the mines owned by this company—the Nellie Bly, Great Northern and Twilight.

STEVENS COUNTY.

(From our Special Correspondent.)

EAGLE.—Mr. R. A. Travarthan has leased this mine for one year. It is located near Chewelah. The arrangement made for its purchase is to pay within one year $60,000, and a royalty on all ore extracted. The mine lies within 60 miles of Spokane on the Spokane & Northern R. R. The ore is carbonate of lead and silver. The vein is a contact of quartzite and limestone. Considerable work has already been done and the mine is considered one of the best in this section. The ore has been shipped to Tacoma and Butte,

MAYFLOWER.—A half interest in this mine has been sold to F. W. Holley, Jr., and A. A. Beebe, and development work will be commenced the coming spring.

FOREIGN MINING NEWS.

SOUTH AFRICA.

DE BEERS CONSOLIDATED MINES, LIMITED.—The directors have declared a dividend of 12s. 6d. per share for the half-year ended September last, comparing with 10s. per share for each half-year since the present company was established. In addition to the dividend the shareholders are to receive a bonus in the shape of one share of the British South Africa Company for every five De Beers shares. The notice goes on to state that the distribution will dispose of about 158,000 shares out of the 210,000 British South Africa shares held by the De Beers Company. At the present market quotation of these shares, the bonus is equal to about three shillings in cash. Besides this dividend the sum of £139,218 15s. has been put aside toward the redemption of the various debentures and obligations of the company, and interest thereon to September 30th, and the company will carry forward the enormous sum of £1,138,986 10s., being over £400,000 more than the balance brought forward on March 31st, 1891. To crown the success of the year the company has also concluded the purchase of the entire Wesselton estate, including the recently discovered Wesselton diamond mine, which promised to prove a formidable competitor of the De Beers Company, and has paid the whole of the purchase money.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Jan. 22.

Heavy Chemicals.—The market for heavy chemicals has undergone no change from the condition reported in our last. It may be defined as one of quiet dullness. The spot sales have been small and the demand even less than what the dealers have reason to expect at this season of the year. Certainly not much anxiety concerning the future is displayed by buyers, and their offers generally have been too low to meet holders' views.

Caustic Soda.—No special activity has been manifested in this article. Owing to the excessive supply at present spot caustic is dull and weak, but prices for shipment and forward contracts are firm, and are said to have an upward tendency. We quote this week: 60%, 3·10@3·15c.; 70-74%, 2·85@2·90c.; 76%, 3·15@3·20c.; 77%, 3c.

Carbonated Soda Ash.—A very quiet market. Stocks are high, but there has not been any demand to speak of for spot carb. ash. Some offers for forward shipments have been made, but too low to be accepted by dealers. We quote B. M. & Co., 48%, 1·57½@1·62½c.; 58%, basis 48%, 1·47½c.

Alkali.—While nothing of special interest has occurred in this market, a fair business has been transacted at prices ranging as follows: B. M. & Co., 48%, 1·47½@1·55c., according to quantity; 58%, 1·45@1·50c.

Bleaching Powder.—This article is exceedingly quiet, with very light stocks here. No notable business has been done. Quotations are: 2·10@2·12c.

Sal Soda.—There is fairly a good demand for this article. There is very little English sal soda here, and quotations, nominally, are 1·12½@1·15c. The domestic product has shown some activity, and is now quoted at ·95@1c.

Acids.—This market continues, on the whole, to exhibit the healthy conditions which have characterized it of late. The demand continues good and the volume of business transacted has been satisfactory. We quote for 100 lbs. in New York in lots of 50 carboys or more: Acetic, $1.60@$2, according to quality; alum, lump, $1.50@$1.75; muriatic, 18°, $1; 20°, $1.12½; 22°, $1.25; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 90c @$1.12½; oxalic, $7.2@$7.75. Blue vitriol is quoted all the way from $3.50 to $4.25.

Brimstone.—The market for Sicilian brimstone is quiet and dull. Quotations on the spot are $30 for best unmixed seconds, and $28.75 for best unmixed thirds. The latest quotations received from the other side would indicate that lower prices will rule in the future. Quotations here for January-February shipments are $29 for best unmixed seconds, and $28 for best unmixed thirds, with a weaker market, owing to the lack of an active demand. During the past week about 3,000 tons arrived and relieved the immediate wants of consumers.

Fertilizers.—The market for fertilizers remains as reported last week, that is to say, quiet and without features of interest. Owing to the scarcity of money in the South dealers here do not anticipate a very heavy business in that direction this year. Prices show but little change. Sulphate of ammonia, which advanced slightly last week, is easier and a little lower, quotations being 3·05@3·07½c. Dried blood is $1.90@$1.95 per unit, with moderate stocks on hand. Acidulated fish scrap, $13.50 f. o. h. factory; dried scrap is $23.50@$24.00. Other ammoniates are as follows: Azotine, $2.00; tankage, $19@$21; bone meal, $22@$23.

Double Manure Salts.—All contracts in this article having been filed with the syndicates, very little new business can be reported. Syndicate prices obtain.

Kainit.—Nothing of special interest is doing in this article. Prices remain as reported last week, $8.75@$9.50 for futures according to quantity, time of delivery, etc.

Muriate of Potash.—During the week there arrived 1,000 tons. Following are the quotations per 100 lbs. basis 80%: To New York and Boston, $1.81½; to Philadelphia and Baltimore, $1.84; to Southern ports, $1.86½.

Phosphates.—This market continues weak and dull and utterly devoid of any features. The price was fixed by the combination at $6 for dried and $5 for undried, at Charleston.

Nitrate of Soda.—There has been a fairly active spot demand during the week, the quotations being $2.05. The market for futures is somewhat dull, although the majority of our dealers, with commendable common sense, do not believe that war will occur between the United States and Chili, yet the strained relations between the two countries has occasioned a feeling of anxiety regarding the future which has manifested itself in the market.

NOTES OF THE WEEK.

The value of the imports and exports of alkali and bleach into and from the United Kingdom for the past three years are shown in the following table:

	1889.	1890.	1891.
Exports:			
Alkali	£1,572,900	£2,038,300	£2,390,000
Bleach	563,300	506,100	512,400
Imports:			
Alkali	31,600	29,200	51,700

The imports of guano and bones and exports of manures were as follows:

	1889.	1890.	1891.
Imports:			
Guano	£190,700	£167,100	£136,000
Bones	310,200	372,000	502,300
Exports:			
Manure	2,050,100	2,070,200	2,086,000

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Birmingham, Ala., Pittsburg, St. Louis, London, and Paris, see pages 148 and 150.]

NEW YORK, Friday Evening, Jan. 22.

We were correct in saying last week that the mining market was by no means a corpse yet. During the week under review, and especially at the close, more interest and activity have been manifested than for a long time. It was by no means a "boom," but certainly there has been a steady current of activity. It is especially satisfactory to us to be able to report that the trading has been legitimate and *bona fide*, and not based on the mildly speculative actions of a ring. It is to be hoped that the present movement will continue. From time to time there have been certain spasmodic spurts on the part of the mining market, which have been mistaken for steady activity. From the action of the mining brokers it would appear that they are well pleased with the course of the present market, and we would call to their attention that its continuance depends largely upon themselves.

During the week there have been numerous rumors concerning the San Sebastian Gold Mining Company, of Salvador, Central America, and reports have appeared in various daily newspapers to the effect that the stock had been wiped out by the sale of the company's property. In answer to a communication from Mr. W. H. Lewis, Secretary of the Committee on Mining Securities of the Consolidated Stock and Petroleum Exchange asking for information regarding the present status of the company and the position of the present holders of stock, the secretary of the San Sebastian company, by order of the executive committee, answered as follows: "The company made its annual report as follows: San Sebastian Gold Mining Company, State of New York, City of New York. We, George W. Brown, Dudley S. Steele, Ludwig Dreier, E. Holbrook Cushman and Charles Stewart; trustees of the San Sebastian Gold Mining Company, and a majority thereof, and the said George W. Brown, being the president of the said company, do hereby certify and report that the capital stock of said company is $1,600,000; that the whole of said capital stock has been issued in payment of the property necessary for the company's business: that the existing debts of said company do not exceed $27,000.

"Since that date there have been only such expenditures as were necessary for the care and protection of the mining property and plant, and the condition of the company is not materially changed. The company has been unfortunate in working its ores by a wet crushing process by which a large percentage of the assay value of the ore was lost in the work of reduction; consequently, although a large amount of bullion has been received from the company's mine and passed through the United States Assay Office of New York City, the cost of production was larger than receipts, and it was decided to discontinue the further working of ore until a dry crushing plant could be erected. As this required the expenditure of a considerable sum of money, which the company could not advance, it was proposed to interest other parties in the property. In order that former reports as to the value of the property might be verified, Mr. Charles M. Dobson, a mining engineer, went to the mine to make a thorough examination and report accordingly. This report was made in August, 1891, and fully confirms the previous reports as to the value and character of the mine. After this report was made action was taken by the Board of Trustees of the company on August 24th, 1891, offering a part of their property for sale. Some time after the company was advised that such a sale could probably be made and a meeting of the stockholders of the company was then called in accordance with the following notice, which was advertised in the New York *Evening Post*, on November 25th, 27th and 28th, 1891, and a copy of same sent by mail to every stockholder of record:

Notice to Stockholders. A meeting of the San Sebastian Gold Mining Company will be held at the office of the company Room 20 237 Broadway, on Tuesday December 8th, 1891, at 2 o'clock P. M. The object of the meeting is to ratify the action of the Board of Trustees of the company relative to the disposal of property, taken at a special meeting of the Board held August 24th, 1891 by order of the president, C. I. Blauvelt, secretary.

"The capital stock of the company is 320,000 shares, and at this meeting there was present or represented by proxy, 266,549 shares, every share of which voted to ratify the action of the Board, which is the only action at any time taken by the Board relative to the disposal of property. The company now advise you that an option on a part of the property has been given in England, but there has been no sale made up to this time. In regard to the recently published stories it is only necessary to say that they are untrue and malicious. No action whatever has been taken by the company at any time in reference to the stock of the company. It holds to-day the same rights as it has held since it was issued."

In an interview with a representative of the ENGINEERING AND MINING JOURNAL Mr. Blauvelt said that his letter to Mr. Lewis covered the matter entirely. He explained that by "a part of the

property" upon which an option to an English syndicate had been given, he meant the mining property and plant. The company, he said, would keep its other property. What this property was he could not say, except that it was landed property. He said also that the bondholders, the stockholders and the Board of Trustees were in accord."

There have been sold during the week a total of 42,205 shares against 21.740 shares last week, showing an encouraging increase in the volume of business.

The Comstocks show a slight advance. Reports from San Francisco have been more encouraging and apparently would indicate that an active market is about to be experienced there. Consolidated California & Virginia advanced from $4.25 to $5.25 with sales of 695 shares. Crown Point was stationary at $1.55; Gould & Curry was quiet and advanced from $1.15 to $1.75; Ophir was quiet at $2.80 to $3.50, the latter price obtaining at the close.

Savage was neglected at $1.75 as was also Chollar at $1. Hale & Norcross was traded in at $1 @ $1.40: Sierra Nevada at $1.75 @ $1.85; and Yellow Jacket at $1.15 @ $1.30. There were sold 1,000 shares of Alta at 60c. @ 70c. Best & Belcher was quiet and advanced from $2.35 to $3. Of Comstock Tunnel stock 5,100 shares changed hands at 16c. @ 23c. Exchequer shows a solitary sale of 100 shares at 60c. Potosi was quiet at $1.90 @ $2.35. Of Mexican 650 shares changed hands at $1.70 @ $2.35. Scorpion was neglected at 35c. @ 40c. Segregated Belcher was stationary at 90c. Of Utah there were sold 1,300 shares at 50c. @65c., and 200 shares of Union Consolidated at $1.45 @ $1.50.

Eureka Consolidated shows a sale of 50 shares at $2.

Of the California stocks Belmont shows sales of 300 shares at 65c., and Brunswick of 8,000 shares at 6c. and 5c., the latter price being obtained at the close. There was a sale of 175 shares of Standard at $1.25.

Leadville Consolidated was the feature of the week; 14,900 shares were sold at 20@24c. Reports from this property continue encouraging. At the close there was a sale of 1,100 shares of Robinson Consolidated at 50c.

There was a sale of 60 shares of Osceola at $27.75.

Of the Black Hills stocks there were sales of 600 shares of Deadwood Terra at $2@$2.05, and a sale of 50 shares of Homestake at $13.25. It is said that this company will increase the amount of its dividends during the coming year. The news of this has sent up the price of the stock.

Alice shows a sale of 100 shares at $1.50.

Horn Silver was dealt in to the extent of 525 shares at $3.75@$3.80.

Phœnix of Arizona was in some demand this week, 2,400 shares being sold at 39@46c.

Boston. Jan. 21.

(From our Special Correspondent.)

The weakness in the copper stocks at the closing of our last report was followed by lower prices in the early dealings the present week, with a partial recovery later on. This was again lost and the market continues to drag heavily with no special indication of any improvement in the near future. To-day's market has been quite an active one, but there is no support to prices and they yield easily on any pressure to sell.

Boston & Montana has been the feature in the dealings, and the stock has come out quite freely, and although it touched $38 at one time, it gradually declined, and to-day sold at $36, the lowest point so far the present year. The rights have ruled from 13c. to 10c., and have been very active. There have been rumors that the company will pass the usual quarterly dividend due next month, but they cannot be traced to any reliable source. The officers of the company are reticent about the matter.

Butte & Boston has been very dull this week, only 100 shares changing hands at 15½@15¾, a loss of ¼.

Calumet & Hecla sold in a small way up to $265, declining to $262½, but recovering to the former figure.

Tamarack sold at $160, but was weak to day and declined to $157 for nine shares, a single one selling at $155.

Osceola sold early in the week at $29½. A good deal of stock was offered to-day and it declined to $27. The company has not yet decided about paying a dividend. The last was October 15th, 1891, and it was expected that one would be forthcoming this month, and there is some criticism on the course of the directors in not giving the stockholders a good reason for letting dividend day pass unnoticed.

Franklin sold at $15½ and $15¼ dividend ($2) on, but there have been no sales ex-dividend, although $13 is freely bid for it.

Centennial has been one of the most active stocks on the list, and has held quite steady at $10 @$10¼, selling to-day at $10⅜, with a decline to $10⅛ in the final dealings.

There was very little doing in Kearsage. The stock was very heavy, and declined from $12½ to $11½. Atlantic declined to $11¼, and Allouez sold at $1¼@$1⅜. National came out quite freely at $1@$1¼, and Arnold sold at 65c. Wolverine sold at $3½@$3¾, Santa Fe at 27½c. and Bonanza at 45c.

Quincy declared a dividend of $4 per share, which is $1 less than was paid in August and also at this date in 1891. The increase of 10,000 shares in the capital stock for the Pewahic purchase probably accounts for the reduction. The stock sold for $114 a few days since, but since the Stock Exchange deprived its members of the privilege of trading in the stock the dealings in it are of a private nature and quotations are not generally given to the public.

Sales of Tamarack, Jr., we hear have been made at $53 within a few days.

In silver stocks we note sales Cœur d'Alene at $1.05 and Dunkin at 40c. Napa Quicksilver sold at $4⅝.

3 P. M. The market closed heavy. Boston and Montana sold down to $35, closing at $35¼. Osceola touched $26¾ but closed at $27. Napa quicksilver advanced ⅛ to $4¾.

By Telegraph.—Boston, Jan. 22.—The closing quotations were as follows: Osceola, $26¼; Boston & Montana, $34¾; Butte & Boston, $14⅝; Kearsarge, $12; Centennial, $10; Tamarack, $158; Franklin, $13; Calumet & Hecla, $264: Allouez, $1¼.

Denver.

Prices and sales for the week ending January 16th, 1892:

Company.	Opening.	H.	L.	Closing.	Sales.
Mines.					
Alleghany	....	....	....	07	.....
Amity	02¾	*03¼	02	02½	14,200
Bangkok C.-B	*05½	06	05½	05¼	3,300
Bates-Hunter	15	....	....	15	.....
Brownlow	05	*07	06	05	2,100
Calliope	15	....	....	17	.....
Claudia J	04½	†05	04	04½	42,100
Cash	....	....	...	....	.....
Clay County	100	....	....	....	.....
Emmons	45½a	†49	45½	†50a	10,200
Gettysburg	30a	28	28	30a	1,500
Gold Rock	60a	†65	57	57	300
Leavenworth	05	....	....	....	.....
Little Rule	115a	....	....	†90	.....
Lexington	36	*37	36¼	37¼	2,700
May-Mazeppa	....	....	....	50	.....
Matchless	290	....	....	300	.....
Oro	75	....	....	75	.....
Pay Rock	01¼	01¼	01¼	01¼	5,000
Puzzler	02½a	02	02	....	100
Paul Gold	10	....	....	10	.....
Reed National	100a	....	....	....	.....
Rialto	115a	111	111	75	100
Running Lode	*32	32	30	†33	900
Whale	05	....	....	....	.....
Bal. Smuggler	....	....	....	21a	.....
Sutton	*16	15	15	16	1,200
Prospects.					
Argonaut	20a	....	....	05	.....
Big Indian	...	....	....	10a	.....
Big Six	05¼	....	....	05½	.....
Century	12	†13½	12	12	5,300
Diamond B	03	*04	03	03½	7,900
Nat. G. & Oil Co.	*09	†09	08	08	500
Golden Treasure	62	†90	64	†75	2,500
Ironclad	*16¼	*17	14	15	2,500
John Jay	01	01¼	01	01	3,000
Justice	20½	†23½	20	20	15,100
Morning Glim	10	....	....	10	.....
Park Consolidated	04½	....	....	....	.....
Potosi	01½	....	....	01½	.....
Total					120,400

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

San Francisco. Jan. 15.

(From our Special Correspondent.)

During the past week mining stocks have been remarkably steady, the fluctuations not ranging with the Comstocks more than 5 cents either way. Trading has been more than ordinarily active and the sales of Gold Hill and South End stocks have been large.

The annual election of the San Francisco Stock Exchange took place this week, when A. E. Coffin was elected president; William Edwards, vice-president; T. W. Hadley, secretary; George T. Marye, treasurer, and O. V. Walker, caller. The scheme of reform, outlined in these columns two weeks ago, is being prosecuted, and despite the opposition of interested brokers will, it is to be hoped, take definite shape and result in stopping the abuse by stock brokers of the trust reposed in the owners of stock. It is a debatable question, however, whether the means being now adopted to oust the directors of certain companies from office is not a tampering with the mean and despicable weapons used by the present office holders to sustain themselves in this position. The means being adopted is supposed to be justified by the end sought to be attained, and when it is possible permission of the owners of stock to vote their stock is being asked.

During the past week the North End Comstocks have had a heavy tone, and sales have not been large. Consolidated California & Virginia sold today for $3.70, just 5c. lower than on the same day last week. Mexican has been ruling at $1.55; Sierra Nevada at $1.60; Union Con. at $1.35 and Ophir at $2.65.

The middle group have likewise been dull and heavy, without any great variation in prices. Belcher has sold for $2 and has been the most active stock on account of the recent strike in the mine which may develop into something really important. Chollar, at 95 cents; Gould & Curry, at $1.05; Potosi, at $1.65, and Savage, at $1.30, have all sold in small lots.

Most of the active trading in the Comstocks has been confined to the Gold Hill stocks, and of those the smaller priced stocks have been most in demand. Bullion has ruled steady at $1.20. 1,500 shares of Consolidated New York sold for 50 cents. Overman has also sold steady for $1, and Exchequer at 40 cents. Crown Point at $1.25, and Occidental at 35 cents have made up the balance of the active list.

The Bodies do not seem to sell freely, albeit the outlook at the mines, particularly in the Bulwer, is good. Bodie Con. has sold for 65 cents, and Bulwer for 45 cents. Mono has sold for 80 cents.

Things are quite lively in the Quijotoa camp, but the stocks of the several mines hang fire. Crocker is not in great demand, and has been selling for 15 to 20 cents; Peerless has sold for 15 cents, and Peer, the mine that is crushing ore at present, has been ruling at 25 cents. Silver King sold today for 50 cents.

Of the Tuscarora stocks, only Commonwealth and North Commonwealth have been quoted today. The former sold at 20 cents and the latter at 45 cents.

SAN FRANCISCO, January 22d. [*By telegraph.*] Opening quotations to-day are as follows: Best & Belcher, $2.65; Bodie, 55c.; Belle Isle, 75c.; Bulwer, 40c.; Chollar, $1.30; Consolidated California and Virginia, $4.65; Eureka Consolidated, $1.60; Gould & Curry, $1.55; Hale & Norcross, $1.65; Mexican, $2; Mono, 55c.; North Belle Isle, 35c.; Ophir, $3.15; Savage, $1.60; Sierra Nevada, $1.65; Union Consolidated, $1.65; Yellow Jacket, $1.20.

St. Louis. Jan. 20.

(From our Special Correspondent.)

The market has been dull during the past week. Prices see-sawed up and down. No decided advance except in Hope is shown this week, and with the exception of American & Nettie no very positive decline is noted. Why this last named stock should go down at all is a matter of comment with many. The news from the mine is of the very best character while the fact that a dividend of 5c. per share, payable January 23d, has been declared should have strengthened the stock. Opening at $1 the market remained inactive until Saturday, when 200 shares sold at $1.05. On Monday, with the declaration of the dividend, the stock fell to 95c. and closes at that figure.

Bi-metallic opened at $15 bid, $25 asked, and closes at $10 bid, $25 asked. No sales were made. Despite the accident which happened at the mine this week, and which will oblige the mine shutting down for at least a month, the holders of stock refuse to sell under $25.

Mickey Breen was traded in somewhat this week. It opened at 4c., 200 shares selling at that figure, and closed at 3c. There is little or no demand for the stock.

Elizabeth fell off slightly and from an opening of 76¼c.@77½c. closes at 70c. Sales amounted to 200 shares at 76¼c.@77½c.; 300 shares at 80c., and 800 shares at 76¼c.@70c.

Little Albert had a good week, 3,000 shares changing hands at 6c.@6½c. The market opened and closes at 6c., and is very steady.

While Central Silver had several good sales the interest in the property is not so strong as it might be or has been. Six thousand shares at 14½c. constituted all the trading of the week, and from an opening bid of 14½c. the market closes at 13c.

Leo was on the market during the latter part of the week, and two sales of 3,000 shares at 13c., and 600 shares at 11½c. were made. The stock closes at 12c. bid.

Twenty shares of Granite Mountain brought $16.25 on Friday, and 20 shares more sold on Monday at $16. This makes an advance of 25c. on the opening; the stock is strong at $16.

Silver Age opened at 5c.; 1,100 shares sold on Friday at 6@4c., after which the market became quiet, closing at 4c.

Ten shares of Small Hopes brought 95c., being an advance of 15c. over the opening figures.

Hope showed up very strong toward latter part of the week, Opening at $1.70 it fell to $1, recovered on Monday and on encouraging news from the mine 100 shares sold at $2.50; it closes very strong at $2.25.

Five hundred shares of La Union were sold at ½c.

Pat Murphy, Adams, Yuma, Montrose, etc., were quiet with no trading.

MEETINGS.

Aluminum Steel and Alloy Company, at the office of the company, in Findlay, Ohio, February 1st, at 2 P. M.

Illinois Steel Company at the office of the company in Chicago, Ill., February 10th, at 12 o'clock noon.

Maid of the Mist Silver Mining Company, at the office of Louis Fitzgerald, No. 120 Broadway, New York City, Feburary 1st, at 2 P. M.

Michigan Gold Mining Company, at the office of the company in Marquette, Mich., February 3d, at 10 A. M.

Passaic Chemical Company, at the office of the company, No. 254 Pearl Street, New York City, February 16th, at 3 P. M.

DIVIDENDS.

Consolidated Kansas City Smelting and Refining Company, dividend of ten per cent., payable February 1st at the office of the company, No. 20 Nassau Street, New York City. Transfer books close January 25th and reopen Feburary 2d.

Daly Mining Company, dividend No. 59 of 25

cents per share, $37,500 payable January 30th, at the office of Messrs. Lounsbery & Co., 15 Broad street, New York City. Transfer books close January 23d and reopen February 1st.

Homestake Mining Company, dividend No. 162, of tencents per share, $12,500, payable January 25th at the office of Messrs. Lounsbery & Co., Mills Building, New York City.

Ontario Silver Mining Company, dividend No. 188, of 50 cents per, share, $75,000, payable January 30th, at the office of Messrs. Lounsbery & Co., 15 Broad street, New York City. Transfer books close January 25th and reopen February 1st.

Quincy Mining Company, dividend No. 47, of $4 per share, $160,000, payable Feburary 3d, at the office of W. H. Daniels. No. 35 Congress Street, Boston, Mass. Transfer books close January 27th and reopen Feburary 3d.

Rocky Fork Railway and Coal Trust, dividend of 2½%, payable February 2d, 1892, at the office of the Trust, Mills Building, No. 15 Broad street, New York City. Transfer books close January 25th and reopen February 2d.

ASSESSMENTS.

COMPANY.	No.	When levied.	D'l'nq't in office.	Day of sale.	Am't. per share.
Alliance, Utah	16	Nov. 16	Jan. 9	Feb. 2	.50
Alta, Nev	41	Jan. 5	Feb. 9	Feb. 29	.10
Bevan, Utah	4	Dec. 9	Jan. 16	Feb. 4	.20
Butte Queen, Cal.	1	Nov. 27	Jan. 5	Jan. 25	.02
Challenge, Con, Nev	10	Jan 14	Feb. 17	Mar. 9	.25
Chollar, Nev	32	Jan. 8	Feb. 11	Mar. 3	.50
Cons. St. Gothard G. Cal.	4	Dec. 29	Feb. 6	Feb. 23	.05
Crocker, Ariz	11	Dec. 15	Jan. 19	Feb. 11	.10
Crown Point, Nev	56	Dec. 2	Jan. 6	Jan. 27	.50
Gen. Merritt, S. Dak	4	Jan. 2	Feb. 8	Feb. 29	.00½
Gold Mountain, Cal.	1	Jan. 4	Feb. 8	Feb. 27	6.00
Goodyear, Mont.		Dec. 8	Jan. 14	Feb. 20	.01
Gould & Curry, Nev	68	Jan. 5	Feb. 8	Mar. 1	.30
Grass Valley Queen Gold, Cal.	1	Dec. 31	Jan. 26	Jan. 30	.10
Hale & Norcross, Nev.	109	Jan. 5	Feb. 8	Feb. 18	.50
Justice, Nev.	49	Dec. 23	Jan. 28	Feb. 17	.25
Mexican, Nev.	44	Jan. 14	Feb. 17	Mar. 10	.25
Occidental Con., Nev	9	Jan. 11	Feb. 16	Mar. 10	.25
Potosi, Nev.	37	Dec. 10	Jan. 13	Feb. 4	.50
San José, Nev.	20	Nov. 16	Jan. 2	Feb. 10	.04
Scorpion, Nev.	3	Dec. 15	Jan. 22	Feb. 15	.05
Siskiyou Consol. Quicksilver, Cal.	2	Dec 22	Jan. 28	Feb. 19	.02
Umpire G. & S., Ore	4	Dec. 16	Jan. 25	Feb. 15	.01¼
Union Con., Nev.	45	Jan. 6	Feb. 11	Mar. 2	.25
U. S. Grant, S. D.	4	Dec. 23	Jan. 30	Feb. 15	.00¾
Vulcan, S. Dak	3	Oct. 19	Dec. 18	Feb. 8	.003

PIPE LINE CERTIFICATES.

The visible supply of refined petroleum at the seven principal Continental European ports on January 4th, 1892, was 579,000 barrels, a decrease of 260,000 barrels from the same date in the previous year. The amount taken for consumption from the same ports from July 1st, 1891, to January 4th, 1892, was 2,979,000 barrels, a decrease of 150,000 barrels from the corresponding period of the preceding year. Exports of Russian oil in November were: To Eastern Asia, 702,000 cases; to Antwerp, 19,600 barrels; to London, 23,000 barrels; to other English ports, 40,900 barrels; to Italy, 11,800 bbls.; to Trieste and Flume, 8,600 bbls.; total shipments to Western Europe, 103,900 bbls. The stocks on hand in this country January 1st were 16,002,856·69 bbls., an increase of 1,050,029·60 bbls. The average daily production in December was 123,598·69 bbls., a decrease of 10,388·07 bbls. as compared with November. The receipts in December were 3,827,692·39 bbls., as compared with 4,041,061·55 bbls. in November.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Jan. 16	63	63½	63⅜	62⅜	30,000
18	62¾	62¾	62½	62¼	12,000
19	62⅜	62⅜	62	62	10,066
20	62	62¼	62	62¼	6,000
21	63	63	62½	62½	6,000
22	62¾	63¼	62¾	62¾	53,000
Total sales in barrels					117,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales.
Jan. 16	....	....	....	....	.....
18	....	....	....	....	.....
19	62⅛	62⅛	62⅛	62⅛	5,000
20	....	....	....	....	.....
21	61	61	61	61	10,000
22	....	....	....	....	.....
Total sales in barrels					15,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Jan. 22.

PRODUCTION OF BITUMINOUS COAL for week ending January 16th, and year from January 1st.

WESTERN SHIPMENTS.

	1892. Week.	1892. Year.	1891. Year.
Pittsburg, Pa.	28,554	62,101	68,313
Westmoreland, Pa.	49,331	80,459	96,803
Monongahela, Pa.	11,271	20,135	34,047
Total	89,156	162,695	199,163
Grand total	422,221	737,879	906,142

EASTERN AND NORTHERN SHIPMENTS.

	1892. Week.	1892. Year.	1891. Year.
Phila. & Erie R. R.	1,427	3,048	7,405
Cumberland, Md.	†78,142	78,142	114,425
Barclay, Pa.	†6,781	13,242	7,776
Broad Top, Pa.	8,271	21,132	25,806
Clearfield, Pa.	86,274	176,512	242,640
Allegheny, Pa.	21,278	48,627	61,843
Beach Creek, Pa.	47,127	96,858	132,444
Pocahontas Flat Top	48,896	102,754	90,859
Kanawha, W. Va.	*34,869	34,869	24,001
Total	333,965	575,184	706,979

*Week ending January 7th.
†Nine days ending January 9th.
‡Estimated.

Statement of shipments of anthracite coal (approximated) for nine days ending January 9th, 1892, compared with the corresponding period last year:

Regions.	Jan 9, 1892.	Jan. 10, 1891.	Difference.
Wyoming Region. Tons	545,305	521,342	Dec. 176,037
Lehigh Region "	128,373	157,302	Dec. 28 929
Schuylkill Region "	198,203	310,027	Dec. 111,824
Total. . . . . Tons	671,881	988,671	Dec. 316,790

Statement of shipments of anthracite coal for month of December, 1891, compared with the corresponding period last year. Compiled from the returns furnished by the mine operators:

Regions.	December, 1891.	December, 1890.	Difference.
	Tons.	Tons.	Tons.
Wyoming Region	1,885,041.05	1,672,748.12	I. 212,292.13
Lehigh Region.	581,389.12	487,209.15	I. 94,179.17
Schuylkill. Region.	1,121,540.16	905,249.19	I. 216,290.17
Total	3,587,971.13	3,065,208.66	I. 522,763.07

Regions.	For year 1891.	For year 1890.	Difference.
	Tons.	Tons.	Tons.
Wyoming Region	21,325,239.18	18,657,691.14	I. 2,667,545.04
Lehigh Region.	6,381,838·18	6 329,358.67	I. 52,180.01
Schuylkill Region	12,741,258.05	10,867,821.18	I. 1,873 436 07
Total	40,448,336.11	35,855,171.19	I. 4,593,161.12

The stock of coal on hand at tidewater shipping points December 31st, 1891, was 754,432 tons; on November 30th, 1891, 637,846 tons; increase, 116,586 tons.

Of the total product in 1891, 52·72% was from the Wyoming Region; 15·78% from the Lehigh Region and 31·50% from the Schuylkill Region.

Eastern competitive tonnage, including all coal which for final consumption or in transit reaches any point on the Hudson River or the bay of New York, or which passes out of the capes of the Delaware.

1890.....11,792,317 tons.
1891.....13,313,719 "

PRODUCTION OF COKE on line of Pennsylvania R. R. for the year ending January 16th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 116,727 tons; year, 255,291 tons; to corresponding date in 1891, 228,654 tons.

Anthracite.

The returns of John H. Jones, chief of the bureau of anthracite coal statistics, places the shipments for the year 1891 at 40,448,336.11 tons of 2,240 lbs. The estimate published by the ENGINEERING AND MINING JOURNAL on the second day of the new year was 40,414,905 tons, or was practically as accurate as the official returns. The 33,431 tons difference between the official and our figures is so small as to make little difference in the percentages of the different companies as given by us, namely:

	1890 Shipments. Tons.	1890 P. c.	1891 Shipments. Tons.	1891 P. c.
Philadelphia & Reading	7,527,600	20.89	8,391,824	20.8
Lehigh Valley	6,768,495	18.87	7,204,808	17.8
Cen. Railroad of N. J.	5,615,040	15.66	5,951,114	14.7
Del., Lack. & West.	5,792,769	16.15	6,106,075	15.1
Delaware & Hudson Canal	3,674,800	10.25	3,895,119	9.6
Penn. Railroad Company	4,017,600	11.20	5,165,960	12.8
Penn Coal Company	1,428,485	3.98	1,759,090	4.4
N. Y., L. E. & W.	1,029,785	2.87	1,242,007	3.1
N. Y., O. & W.	.....	....	699,896	1.7
	35,855,174	100	40,414,898	100

The stock on hand at tidewater shipping points on December 31st, 1891, was 754,432 tons, an increase of 116,586 tons in a month, and of 116,744 tons in a year.

The tables at the head of the column furnish in detail the outputs of the different regions for the week, month and year last reviewed.

The threat of a coal war, which has been hanging like a cloud over the trade for six months, seems likely to materalize, in fact the first gun has been fired, and serious results can now be averted only by the prompt action of the presidents of the anthracite roads.

A second adjourned meeting of the sales agents was held on the 18th inst. to consider the question of an 1892 allotment. The date of this meeting, as of that which preceded it, being fixed at the instance of President McLeod, of the Philadelphia & Reading. Owing to the sickness of General Manager Henderson, of the Reading, that company was not represented at the meeting by any one who had authority to act. The discussion of the tonnage elicited the statement from one of the sales agents that it was a question with which only the presidents of the companies were competent to deal. This seemed to meet with general approval, and the subject was finally left without formal action. Then followed a very caustic and unsatisfactory talk, in which the ruling sentiment expressed was that the agents were tired of temporizing with the Reading. Before its close two of the sales agents made the statement that they were going to sell their coal for what it would bring in the market.

The next morning the Lehigh & Wilkesbarre Coal Company issued the following circular of net prices, f. o. b. Port Johnston: Broken, $3.25; egg, $3.35; stove, $3.50; chestnut, $3, with 20c. added alongside, New York. The companies, with the exception of the Reading and Lehigh Valley, immediately met the cut. Of these two the Reading on Thursday was "considering the situation," and the Lehigh Valley "would undoubtedly do the same as the others."

This cut is calculated to bring the Reading to an understanding with the other companies. There seems also to be a desire to strike a blow at the independent operators, who, during the past two months have had things their own way by cutting slightly under the companies. The production of these independents, or the "mugwumps" of the coal trade as we may call them, is about 10% of the total output. They claim that they are not seekers for business at present figures, and say that the greater the cut the quicker the war will be over. There seems to be plenty of pugnacity behind this cut, and if it be considered necessary to make another cut in order to accomplish certain ends, it will probably be made.

The outcome is very difficult to predict. One sales agent said: "Yes, there will be a short fight—it might be called a coal war—which will reach ultimate settlement through the presidents. There is the usual feeling on the part of "the companies" that "it will do no harm to administer a wholesome little lesson to the independent operators." The regular monthly meeting of the sales agents will be held on the 28th inst.

As for the trade, the demand has been stimulated by the cold weather, but owing to the uncertainty as to prices in the future, orders are given only to meet temporary needs.

The effect on stocks has been directly opposite to what was expected. Instead of a decline there has been an advance in four or five of the principal stocks. Delaware & Hudson Canal went from $124.50@$125.25 on the 18th inst. to $125@$126.50 yesterday. The ranges of the other stocks between those dates were as follows; Delaware, Lackawanna & Western, $138.75@$139¼ to $140.50@$142.75; Lehigh Valley, $50.75@$50¾ to $50.75@$51; Central, $112½@$113 to $115@$115.75; Philadelphia & Reading, $38¾@$40.50 to $40¾@$41¾. For fluctuations see stock tables.

Production is being restricted. Returns for the week ending January 9th show an output of 671,881 tons, being on a basis of about 2,600,000 tons for the month, and a decrease over the corresponding week in 1891 of 316,790 tons.

COXE BROS. & CO.'S SUIT AGAINST THE LEHIGH VALLEY RAILROAD COMPANY.

The text of Judge Atkinson's decision in the action of the Interstate Commerce Commission vs. the Lehigh Valley Railroad Company, rendered on Saturday, the 16th inst., is to the effect that the case may be re-tried before a United States court at the option of the Commission. This establishes a precedent by the terms of which every finding not satisfactory to either party to the action may be retried by a United States court.

Judge Acheson says:

"Upon the complaint of Coxe Bros. & Co. against the Lehigh Valley Railroad Company, made to the Interstate Commerce Commission, pursuant to the act of Congress, entitled 'An act to regulate commerce,' approved February 4th, 1887, and the amendatory acts of March 2d, 1889, and February 10th, 1891, the said commission found and decided that the rates established by the said railroad company, and in force over and upon its lines of railroad, for the transportation of anthracite coal from the Lehigh anthracite coal region, in the State of Pennsylvania, to Perth Amboy, in the State of New Jersey, were unreasonable and unjust; and the commission fixed a scale of maximum rates of freight for such transportation, and issued an order requiring the said railroad company to cease and desist, from and after a certain specified date, from making any charge in excess of the rates so determined upon by the Commission.

"The railroad company having neglected and refused to comply with this order, the Interstate Commerce Commission, proceeding under the 16th section of the law as amended, applied by petition to this court, sitting in equity, praying for a writ of injunction or other proper process, mandatory or otherwise, to restrain said railroad company from further violation of and disobedience to the said order of the Commission. To this petition the railroad company filed an answer, which, besides other defenses of a legal character therein raised, denies that the rates established and charged by it for the transportation of anthracite

coal, as aforesaid, were unreasonable and unjust, and alleges that the same were and are reasonable and just rates; and the answer further avers that all the findings of fact by the commission, which led it to the conclusion that the rates charged by the defendant were unreasonable and unjust, were erroneous, and were not in accordance with the evidence. The case was set down for hearing, and has been argued upon the petition and answer.

"Several questions of great importance, both to the parties to this litigation and to the public, are here involved; but at this time we deem it necessary to consider only one of these questions, namely, in this proceeding instituted by the Interstate Commerce Commission to enforce its order against the defendant railroad company, what effect is to be given to the findings of fact by the commission embodied in its written report, and upon which its said order was based.

"It has been argued earnestly and ably by counsel representing the Interstate Commerce Commission that the present proceeding is to be regarded as a controversy between the Commission and the defendant company distinct from the original case between Coxe Bros. & Co. and the defendant; that the original case is not here retriable upon its merits, however it might be, were Coxe Bros. & Co. the petitioners; that while the court may look into the testimony taken by the commission to see whether there is any justification for its decision, yet, if the commission acted upon competent evidence and within the scope of its authority, and the defendant had a fair trial before it, the findings of fact by the commission are not here open to question, but must be accepted as conclusive.

"But, as respects the weight to be given to the findings of fact, the statute, we think, affords no ground for making any distinction between an application to the court by the commission itself and such an application by the original complainants at whose instance the order sought to be enforced was made. As we shall hereinafter see, the law provides that application to the court for the enforcement of any such order may be made either by the commission or by any company or person interested in the order. No sound reason exists for according greater efficacy to the findings of fact in the one case than in the other, and the statute does not recognize any such distinction. What force, then, have the findings of fact upon which the petitioner here relies?

"If the acts of Congress had been silent as to the effect to be given to findings of fact by the Interstate Commerce Commission, it might, perhaps, have been reasonably inferable that the legislative intention was that those findings should fall within the general rule; that where the law has confided a special tribunal the authority to hear and determine certain matters in the course of its duties, the decision of that tribunal, within the scope of its authority, is conclusive upon all other tribunals. But any such implication is excluded by the express terms of the Interstate Commerce law. Section 14 of the act as amended, after providing that whenever an investigation shall be made by the commission, it shall be its duty to make a report in writing in respect thereto, which shall include the 'findings of fact,' upon which the conclusions of the commission are based, declares: 'And such findings so made shall thereafter, in all judicial proceedings, be deemed prima facie evidence as to each and every fact found.' Now, clearly this provision is quite irreconcilable with the idea that in an application like the present one the findings of fact by the commission operate conclusively.

'But, furthermore, Section 16, as amended, provides as follows: 'That whenever any common carrier, as defined in and subject to the provisions of this act, shall violate, or refuse or neglect to obey or perform any lawful order or requirement of the commission created by this act, not founded upon a controversy requiring a trial by jury, as provided by the seventh amendment to the Constitution of the United States, it shall be lawful for the commission or for any company or person interested in such order or requirement, to apply in a summary way, by petition, to the Circuit Court of the United States, sitting in equity in the judicial district in which the common carrier complained of has its principal office, or in which the violation or disobedience of such order or requirement shall happen, alleging such violation or disobedience, as the case may be; and the said court shall have power to hear and determine the matter . . . and said court shall proceed to hear and determine the matter speedily as a Court of Equity, and without the formal pleadings and proceedings applicable to ordinary suits in equity, but in such manner as to do justice in the premises; and to this end such court shall have power, if it think fit, to direct and prosecute in such mode and by such persons as it may appoint, all such inquiries as the court may think needful to enable it to form a just judgment in the matter of such petition; and on such hearing the findings of fact in the report of said commission shall be prima facie evidence of the matters therein stated; and if it be made to appear to such court, on such hearing or on report of any such person or persons, that the lawful order of requirement of said commission drawn in question has been violated or disobeyed, it shall be lawful for such court to issue a writ of injunction or other proper process, mandatory or otherwise, to restrain such common carrier from further continuing such violation or disobedience of such order or requirement of said commission, and enjoining obedience to the same.' This section further provides for proceedings on the law side of the court where the matters involved are founded upon a controversy requiring a trial by jury, and enacts that 'at the trial the findings of fact of said commission, as set forth in its report, shall be prima facie evidence of the matters therein stated.'

"Thus has Congress most carefully defined and limited the effect of the findings of fact by the Interstate Commerce Commission in all judicial proceedings, whether at law or in equity.

"But then again, upon an analysis of the above quoted provisions of Section 16, it is demonstrable that in such a case as this it is the duty of the court to investigate the merits of the whole controversy and form an independent judgment. The court, upon a petition alleging the violation of a 'lawful' order, is to proceed to 'hear and determine the matter as a court of equity in such manner as to do justice in the premises,' and to this end it may prosecute in such mode and by such persons as it may appoint all 'needful inquiries' to enable it to 'form a just judgment' in the matter of the petition, and, finally, 'on such hearing, the findings of fact in the report of said commission shall be prima facie evidence of the matters therein stated.' Nothing can be clearer than that the findings by the commission are not here decisive of the questions of fact.

"We have only to add that our conclusion is in harmony with that of the Circuit Court in the case of Kentucky, etc., Bridge Company vs. Louisville, etc., Company, 37 Fed. Rep. 567.

"In view, then, of the denials and averments of the answer the present motion must be denied, but without prejudice to the right of the petitioner to file a replication, and it is so ordered."

Bituminous.

The bituminous coal trade is exceedingly dull. This condition may be attributed to the fact that during the season up to date, consumers have kept on hand a maximum supply; they have now reached a point in the life of their contracts when they have stock enough on hand to tide them over the year or to March 1st, consequently there is very little buying. Stocks at tidewater are large and accumulating. The companies almost without exception, are restricting production as a matter of self-defense rather than through a desire to keep within the official allottment.

A thorough canvass of the trade this week failed to find more than the usual mere "rumors" of rate cutting. The fact is the tonnage moving is entirely on contract, there being little new business on which to cut rates. The few new orders that have been taken this week are said to have gone at the Seaboard price of $2.50 and $2.60 Baltimore and Philadelphia, respectively.

Transportation facilities to tidewater are said to be adequate. Operations were badly hampered last week by the rain, which, percolating through the loaded coal cars, froze, forming an almost immovable mass. Ocean freights are weaker, owing to the lack of demand for vessels. From Philadelphia to Boston we quote 90c., to Sound ports 75c.; from Baltimore and Norfolk 5c. additional.

Boston. Jan 21.

(From our Special Correspondent.)

There has been very little done here in anthracite since my last report. Those companies that have a pocket business are doing considerable in that line. Quite a number of the coal yards away from the coast that depend on the pockets find themselves obliged to buy during this cold weather. There is no let up in the demand for Lykens Valley stove coal, consequently prices are held very firm, full circular rates being realized. Other quotations are easy.

The bituminous coal market has been very much like the anthracite coal market in all but one respect, and that is offerings. There is a great deal of anthracite offering, while the supply of bituminous forthcoming is just sufficient to keep dealers going on their contracts. Soft coal on cars here is worth $3.80. Gas coal is very dull.

Freight rates are easier, a natural consequence after such dull trade as we are now having. Rates to Sound points are especially weak. We quote: From New York to Boston, 65@70c.; from Philadelphia to Boston, 90c.; from Philadelphia to Portland, 90c.@$1; to Bath, Me., $1; from Baltimore to Boston, $1; Newport News to Boston, $1; Sound Points, 75c.

The retail market has been active during the week. Cold winter weather is always attended with a large consumption of coal and household stocks are always replenished in preparation. We quote retail prices in this market: Free burning stove, $5.50; nut, $5.50; egg, $5.25; furnace, $5.25; Franklin, $7; Lehigh furnace, $5.50; Lehigh egg, $6; Cumberland at wharf, $3.75; screenings, $2.

The receipts of coal at the port of Boston for the week ending January 16th were, 9,975 tons of anthracite and 5,945 tons of bituminous, against 21,451 tons of anthracite and 20,160 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 44,501 tons of anthracite and 20,160 tons of bituminous, against 63,347 tons of anthracite and 31,475 tons of bituminous for the same time last year.

Buffalo. Jan. 21.

(From our Special Correspondent.)

"Zero weather," that's about all the news interesting to coal dealers that occurs to your correspondent to communicate; for such kind of temperature has prevailed for some days and still continues to prevail in this section of the United States, as well as at other points, as noted in the meterological reports. From a paper read to the Buffalo Merchants' Exchange members, at the recent meeting, by Mr. Thomas Loomis, the chairman of the Coal Committee, the following is taken:

"It is estimated that about the same amount of anthracite coal was consumed for domestic purposes in 1891 in Buffalo as heretofore. From a reliable source it is learned that the Buffalo Natural Gas Company has about 3,500 consumers, but, owing to the extraordinary growth of the city, the consumption of anthracite coal has not decreased.

"The dock facilities for transferring coal from cars to vessels, and also from gondolas to box cars for Western shipment from Buffalo by rail have been increased and improved during the past year, and are unequaled by those of any other shipping point in the country.

"Your committee find it impossible to make an exact statement of the coal tonnage at this port owing to the absence of reports from the railroads centering here, and they respectfully recommend to your Exchange the adoption of a system similar to the one used by the Chicago exchange, by which a detailed monthly report is made, showing the receipts and shipments of anthracite and bituminous coal and coke to and from that market, together with a comparative statement of the receipts and shipments for the preceding year.

"The information contained in such a report would be of great value to those immediately interested in the coal trade in this city, to the railroads who transport it, as well as to the business public generally. The volume of tonnage is so large that it will naturally attract attention in other parts of the country, and from those who are desirous of investing in manufacturing or other enterprises which require the use of fuel.

"It is generally admitted, however, that the shipments of both anthracite and bituminous by lake and rail in and out of this market have been very considerably increased over the shipments of the previous year. This is particularly true of soft coal.

The present stock of coal in the west is such that with an average winter we confidently expect a largely increased movement by lake during the ensuing season.

Chicago. Jan. 20.

(From our Special Correspondent.)

The continuous cold weather we have had during the past two weeks has had a good effect on local trade, both wholesale and retail, but more noticeable in the latter. Anthracite has been active and most of the coal yards have had about all they could take care of, and wholesalers have reaped a small share of the benefit which has obtained to the retailers. Outside country buyers in the territory tributary to Chicago have in some instances increased their orders, but as a rule the market is practically unchanged and prices are on the same low level that they have been for some time past. How could it be otherwise, with the large amount of all rail coal still coming forward and being offered at $4.75@$4.90 on track? The large amount of coal which has been used by reason of the severe weather is being rapidly replaced by other car coal, and the outlook from shippers' standpoint is not an iota improved by the late drafts on them. The overstock of all rail and dock coal is an insuperable obstacle to any amelioration of values, and the season is now too far advanced to look for any activity. Demand will be entirely governed by meteorological conditions, and cannot be swayed or increased by low prices. Milwaukee trade has been somewhat demoralized by the assignee of the Hadfield Company offering coal to shippers at $4.60 per ton on cars at that point. The tonnage to be disposed of is somewhere in the neighborhood of 10,000 to 15,000 tons, more or less. The real estate assets of the defunct firm will probably be held for awhile.

There is an abundant supply of eastern soft coal. Hocking, Shawnee, and similar grades and prices are are a little more steady than they have been, though that is not saying much, as the surplus is still large. This, too, notwithstanding the heavy consumption during the past week or ten days. Supply of Illinois coal is excessive, but Indiana block is still short and insufficient to supply daily orders. The fact is the motive power of the Chicago & Eastern Illinois R. R. is not adequate to handle the necessary amounts needed at the present time. We are informed that arrangements have been made for a number of additional locomotives, and another week may witness a more satisfactory condition of things.

Best grades of foundry coke continue in good demand and consumption is greatly enlarging. Prices on standard makes and qualities are steady.

Circular prices are unchanged at the following, rates: Lehigh lump, $6.25; large egg, $5; small egg, range and chestnut, $5. Retail prices per ton are: Large egg, $5.75; small egg, range and chestnut, $5.75.

Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are: Pittsburg, $3.15; Hocking Valley, $3;

Youghiogheny, $3.25; Illinois block, $2@$2.15; Brazil block, $2.50.

Pittsburg. Jan. 21.

(From our Special Correspondent.)

Coal.—The Pittsburg market is decidedly firmer than the lower markets, and prices are proportionately higher. During the last 24 hours natural gas has been extremely scarce, and parties that had not used coal since gas was introduced had to return to coal. Pittsburgers suffered very severely. Coal shipments since our last by the Ohio River have been: To Cincinnati, 1,485,000 bushels; Louisville. 1,479,080 bushels; total, 3,182,000 bushels. This leaves the harbor bare for the present.

Coke.—The market is steady, but not very active. Producers are complaining of a lack of orders but are hopeful of an improvement in that line in the near future. Reports are in circulation that some new contracts have been secured at a slight advance. Production shows a slight increase; the shipments fell off, owing to a lack of cars and orders. The result was coke has been stacked at several points. The Frick Company has just fired up 60 ovens that have been idle for some time. Leisenring now has 415 ovens in operation, and 88 idle. The Frick plants made four, five and six days. The McClure Company worked six days. The ovens of the Dunbar Furnace Company, with the Cambria Iron Company and the Olner Coke Company, all made six days. The week's shipments were as follows: To points west of Pittsburg 3,745 cars; to parts east of Pittsburg, 1,600; to Pittsburgh, 1,675; total, 7,020. Prices are unchanged so far; an advance is talked of.

METAL MARKET.

NEW YORK, Friday Evening, Jan. 22.

Prices of Silver Per Ounce Troy.

Jan.	Sterling Exch'ge.	Lond'n Pence.	N. Y. Cts.	Jan.	Sterling Exch'ge.	Lond'n Pence.	N. Y Cts.
16	4.84½	43	93¼	20	4.85	42 1/16	*
18	4.84½	43	93¼	21	4.85¼	42 1/16	92⅝
19	4.84½	42 1/16	92¼	22	4.85¼	42 1/16	93⅜

The market declined under the announcement on the 18th that the Government had purchased its quota. Since then there has been a good export demand, presumably on Spanish account. No inquiry of any consequence for India. Bank rates there have been advanced to 4%, and their reserves continue to grow smaller, so that it would seem reasonable to expect some inquiry in that quarter for silver. As silver legislation advances here, and discussion and partial progress seem inevitable, we may look for some speculation in our home market.

The United States assay office at New York reports the total receipts of silver for the week to be 139,000 oz.

By Telegraph.—El Paso, Tex., Jan. 22.—The new order just sent out from the Treasury Department of Mexico, placing a heavy duty on all high grade ores exported into this country for the protection of the Mexican smelting companies has resulted in an ore blockade at Juarez, near this place, 70 car loads of ore being stalled in the yards of the Mexican Central Railway Company.

Silver Bullion Certificates.

	Price. H.	Price. L.	Sales.
Jan. 16	....	....	....
Jan. 18	....	....	....
Jan. 19	93		1,0
Jan. 20	93	92¼	35,0
Jan. 21	93	92¾	21,000
Jan. 22	93	93⅜	45,000
Total sales in barrels			102.000

Domestic and Foreign Coin.

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

	Bid.	Asked.
Trade dollars	$ .72	$ .75
Mexican dollars	.72	.73
Peruvian soles and Chilian pesos	.70	.72
English silver	4.75	4.85
Five francs	.93	.95
Victoria sovereigns	4.84	4.89
Twenty francs	3.84	3.88
Twenty marks	4.74	4.76
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.78	4.83
Mexican doubloons	15.50	15.70
Mexican 20 pesos	19 50	19.60
Ten guilders	3.96	4.00
Fine silver bars	.92¾	.93¼

Copper.—The market for copper has been rather unsatisfactory during the whole week; London exhibited a decided weakness which reacted on our market; not that there is any pressure from any side to sell. On the contrary, offers of casting copper are as rare as ever, and the prices obtained are quite close to those ruling for Lake, for which there are some sellers in the market, and transactions have, we hear, taken place at 10¾@10.80. The larger Lake companies are partly out of the market, and partly sellers at not below 11c., but in the present state of things, consumers are rather holding off from making purchases now. We hear that manufacturers are well booked with orders for some time ahead, except for electrical purposes, for which the demand is not yet up to high water mark.

Exports continue on a rather satisfactory scale and we hear that in Europe consumption is good. From Montana our advices are that the Anaconda is producing pretty heavily, but none of that copper has yet been on the market. The first shipments have had to be applied against old contracts made in England during the summer of last year and based on G. M. B. prices. Arizona pig copper is not obtainable at market values. We have to quote Lake copper at 10·85@11c. and casting copper at 10⅝@10¾c.

The G. M. B. market in London has been quiet, but on the 21st very heavy trading took place, about 1,200 tons changing hands, causing prices to react to £45 for cash, but the close is rather better, and we have to quote £45 2s. 6d. for spot and £45 10s. @£45 12s. 6d. for futures. For manufactured copper we quote: English tough, £48 10s. @ £49; best selected, £49 10s.@£50; strong sheets, £58@ £59; yellow metal, 5⅝d.@5¼d.

The statistics have been cabled over showing an increase of 800 tons for the first half of this month,

Acting Secretary Spaulding has informed the Collector of Customs at Corpus Christi, Tex., that the weight of the copper in ingots or bars, dutiable at the rate of 1¼c. per lb. under paragraph 191 of the Tariff act, must be the gross weight of such bars or ingots, and has instructed him to discontinue the practice prevailing at Laredo, in his district, of assessing duty at the rate of 1¼c. per lb. of the fine copper contained in imported ingots or bars.

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

To Liverpool—	Copper Matte.	Lbs.	
S. S. Chantry	8,093 bags.	842,100	$58,000
" Holland	6,085 bags.	681,700	45,000
" Columbia	3,301 bags.	360,900	25,000
" Ptolemy	1,933 bags.	245,214	16,000
" Umbria	1,839 bags.	202,000	14,000
" Greece	4,050 bags.	445,610	30,000
To Stettin—	Copper.	Lbs.	
S. S. Italia	90 casks.	112,500	14,000
To Liverpool—	Copper.	Lbs.	
S. S. Greece	191 casks.	248,300	25,000
To Hamburg—	Copper.	Lbs.	
S. S. Marsala	140 bbls.	175,000	20,000
" Suevia	88 casks.	22,500	2,800
" "	18 bars (bullion).		3,100
" Scandia	297 bars.	51,461	5,100
To Bremen—	Copper.	Lbs.	
S. S. Elbe	422 pigs.	134,542	14,000
To Rotterdam—	Copper.	Lbs.	
S. S. Birchfield	602 bars.	200,002	18,000
" Maasdam	20 bbls.	25,000	2,750
" "	72 cakes.	11,288	1,240
" "	73 pigs.	25,080	2,500

Tin, following the course of the London market, has been flat and early this week sales took place at 19 70c. for spot, with buyers for future delivery at the price. Since then slightly better prices have been obtainable, not much being done, and the market closes rather quiet.

In London the tendency was flat, and prices have declined about £1. closing at £89 10s.@£89 12s. 6d. for spot and only 2s. 6d. higher for three months.

Lead.—Very little business has been transacted and there is again a deadlock in the market. The quotation stands at 4·10c., but at that price there are a good many buyers but no sellers. Unless smelters see their way to meet the market, it is likely that prices will stiffen somewhat. Meanwhile we have to quote for carload lots 4·15c.@ 4·175c.

In the foreign market a geat weakness is exhibited, and Spanish lead is quoted at £10 17s. 6d. @£10 18s. 9d., while there are sellers of English lead at £11. The supply of lead in the English market is larger at present than consumption and prices have come down to a very low point.

St. Louis Lead Market.—The John Wahl Commission Company. telegraphs us as follows: "Market has been slowly declining during the past week with sales at 3·87½ to 3·90c. It is our opinion that the market has about reached the lowest point for the time being."

Spelter is rather irregular; from St. Louis some better prices are reported, but from the intermediate places rather easier figures are quoted. We have to name 4·65@4·70c., New York.

In London the market has declined and good ordinaries are quoted at £22 5s., and specials £22 10s.

Antimony is in limited demand only. Cookson's at 16@16¼c., L. X. at 15c., and Hallett's at 11¾@ 12c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Jan. 22.

The iron market this week exhibits the same general features which have characterized it for some time past. It is quiet and dull. Dealers generally report that cousumers are well supplied and that, apparently, they do not display any anxiety concerning the future. We know of several instances where buyers have made offers at prices which did not meet the views of the furnaces. There has been some inquiry for the various grades of iron, and dealers, who never look for a very heavy business at this time of the year, will have it that it is indication of a coming improvement in the trade. Nothing to which special interest could attach has occurred during the week under review, and the market closes quiet.

American Pig Iron.—The same hand-to-mouth business is doing in the market. The majority of Southern furnaces do not show any inclination to sell at some of the prices offered by certain consumers here. There is one Alabama company which is pressing iron on this market, but not so strenuously as to be alarming, or even to be taken as indicative of the condition of the Southern furnaces. We know of cases where in reply to inquiries Southern furnaces have telegraphed answers that they would not accept the prices bid since they could do better in the West. Meantime quotations remain: Northern, No. 1 X, $17@$18; No. 2 X, $16@$16.50; Southern, No. 1 X, $16.50@ $17.50; No. 2 X, $15.50@$16.50.

Spiegeleisen and Ferro-Manganese.—There is little doing in any of these, no sales worthy of mention having occurred during the week. Quotations are nominally as follows: 20% spiegeleisen, $26.50@$27; 80% ferro-manganese, $62@$62.50.

Steel Rails.—No new business has been done during the week, and the steel rail market is as quiet as ever. The talk of activity in the Eastern mills to come from the demand of railroads has appeared again, and the mill men are armed with statistics which show to their satisfaction that the railroads of necessity must come into the market very soon. The financial conditions of the roads continue to improve, which is encouraging to the mills. Quotations continne at $30 f. o. b. mill and $30.70 tidewater.

Rail Fastenings.—This market continues as dull and uninteresting as can be. Nothing is doing. We quote: Fish and angle plates, 1·75@1·80c.; spikes, 2·10@2·15c.; bolts and square nuts, 2·70@ 2·80c.; hexagonal nuts, 2 80@2·85c.

Merchant Steel.—Business in this market is quite good, and some manufacturers claim to be busy. New contracts are making, and the prospects for a good year are bright. Our quotations are as follows: R. Mushet's special, 48c.; English tool, 15c. net.; American tool steel, 7@8c.; 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.

Tubes and Pipe.—Considering the season of the year a fair amount of business is doing. The association of tube manufacturers held a meeting last week, but prices were not changed, We therefore quote ruling discounts as follows: Butt, black, 57½%; butt, galvanized, 47%; lap, black, 67½%; lap, galvanized, 55%; boiler tubes, under 3 in. and over 6 in., 55%: 3 in. to 6 in., 60%.

Structural Material.—This market continues in good condition. Manufacturers all are looking to a very good year. Quotations are: Universal plates, $2.10; bridge plates, $2.10; tees, $2.60.

Old Rails.—There is absolutely nothing doing in old rails. Quotations are merely nominal, as prices depend altogether on the buyer. We quote nominally: Old tees, $20@$21; doubles, $22@$23. Wrought iron scrap is quoted at $19@$20.

NOTES OF THE WEEK.

From Cleveland we learn that sales of a considerable tonnage of Lake Superior iron ore for delivery over 1892 (about one-third of an estimated output of 8,000,000 tons) have been made to Carnegie and the Illinois Steel Company and other large interests, and that the rate is an advance of from 35c. to 50c. a ton over 1891 quotations and the advance in freight rates. This has not served to fix a general list of prices. however, for the reason that the purchasers, owning as they do heavy interests in mining properties, have in reality been buying from themselves. Inquiry is quite general and is becoming eager, and considerable activity is promised. The general market will not be opened until Lake freights have been fixed. Mining companies owning their own carriers have endeavored to set the pace by fixing the rate from Ashland and Two Harbors to Lake Erie ports at $1.25. It is yet too early to prophesy the effect of this action. Deliveries to the furnaces continue heavy, being 24,000 tons last week, against 16,000 tons for the corresponding week in 1891.

Chicago. Jan. 20.

(From our Special Correspondent.)

The large orders which have been and are now being placed for rolling stock, steel rails, etc., by Western railroads is having a hardening effect on the market. The Santa Fe system last week gave out an order for 2,000 cars, divided between four Western car companies. Several contracts for round lots of steel rails were also closed with our local mills. In merchant steels we know where manufacturers have been compelled to decline new business at any price on account of the crowded condition of their mills. Then again the steadily increasing demand for crude iron will very soon place furnaces in a condition to stiffen prices, and while this may not come about for several months, some local makers are now refusing to extend deliveries through the year for large quantities. Demand for finished iron of all kinds is improving, and prices are steadier than they have been. Scrap is in better demand, and the outlook more encouraging for old material generally.

Pig Iron.—Since January 1st a number of blast furnaces in the South have blown out either for repairs or because they were unfavorably situated, and could not stand the continued pressure of low prices. On the other hand, some of the leading producers are sold up on foundry grades. Local furnace agents report a good deal of buying, and many consumers who usually buy for several months only are now covering requirements for the year at present low prices. In some of these sales concessions have been, and are being made, which, in view of the enhanced cost of new ore and the propitious outlook, is a very unwise policy. One of the largest manufacturers of coke iron in this market has expressed himself very freely on this matter of long time sales at current rates, and may be expected to withdraw from the market on that class of business until betterment of prices is brought about. Sales have ranged from 500 to 1,500 tons and additional large lots will be placed this week. Lake charcoal is in fair demand and the general quotation is $17, with only one or two furnaces shading that price and more quoting $17.25@$17.50.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, $17@17.50; Lake Superior coke, No. 1, $15.50@$16; No. 2, $15@$15.50; No. 3, $14@$14.50; Lake Superior Bessemer, $17; Lake Superior Scotch, $17@$17.50; American Scotch, $17.75@$18.25; Southern coke, Foundry No. 1, $15.50; No. 2, $15; No. 3, $14.50; Southern coke, soft, No. 1, $15.50; No. 2, $14.50; Ohio silveries, No. 1, $18; No. 2, $17; Ohio strong softeners, No. 1, $18; No. 2, $17; Tennessee charcoal, No. 1, $18; No. 2, $17.50; Southern standard car wheel, $20@$21.

Structural Iron and Steel.—Inquiry for material increases each week, and embraces everything under this caption. Industrial enterprises are multiplying and the amount of work on architects' boards is large. Quotations for car lots f. o. b. Chicago are as follows: Angles, $2@$2.15; tees, $2.40@$2.50; universal plates, $2.15@$2.25; sheared plates, $2.20@$2.30; beams and channels, $3.20.

Plates.—There is a distinct improvement in the inquiry for mill business, but without any betterment in prices. Warehouse trade is moderately good. Prices on tubes are on a low level, and in many instances extra discounts are used as a leader to secure orders. Steel sheets, 10 to 14, $2.40@$2.50; iron sheets, 10 to 14, $2.20@$2.30; tank iron or steel, $2.10@$2.15; shell iron or steel, $3@$3.25; firebox steel, $4.25@$5.50; flange steel, $2.75@$3.25; boiler rivets, $4.25; boiler tubes, 2¾ in. and smaller, 55%; 7 in. and upward, 65%.

Merchant Steel.—New business from manufacturing consumers and from dealers continues very satisfactory and in some instances mills are compelled to pass them as they are booked to full capacity. Tool steel is in good demand. We quote $6.75@$7 and upward: tire steel, $2.30@$2.50; toe calk, $2.50@$2.65; Bessemer machinery, $2.10@$2.20; Bessemer bars, $1.90@$2; open hearth machinery, $2.60@$2.75; open hearth carriage spring, $2.50@$2.75; crucible spring, $3.75@$4.

Steel Rails.—The steel company here has entered a number of large contracts during the week. If orders continue to come forward as freely as they have done, some of the roads will be obliged to take such deliveries as they can get. The price, $31, is uniformly steady on large quantities. Light sections are also in good demand just now. Splice bars, spikes and bolts are more active. Regular quotations are: 1·80@1·85c. for steel or iron; spikes at $2.15@$2.25 per 100 lbs.; track bolts hexagonal nuts, $2.70.

Galvanized Sheet Iron.—Agents and dealers complain that they cannot obtain supplies fast enough, and discounts are very firm at 67% off on Juniata and 67½% and 5% off on charcoal in large lots. Small quantities are quoted at 65% and 10% from list.

Black Sheet Iron.—Light and heavy ganges are in good demand, and inquiry more active from consumers and large dealers. Mill quotation is firm at 2·90c. Chicago, for No. 27 common. Jobbers' price is 3·10c, from store and demand light.

Bar Iron.—Inquiry from general manufacturers expanded considerably during the week. Large dealers from outside points have placed orders, and there are now fewer mills willing to enter business at less than 1·70c. either on car iron or for regular assortments covering half extras. Dealers quote $1·80@1·90c., according to quality and quantity and demand improving.

Nails.—The price on wire nails in mill quantities is firmer at $1.80 Chicago, and the volume of business booked so far this year is very satisfactory. Store price is now firm at $1.90. Steel cut nails are in active demand and jobbers are buying freely, as the indications point very strongly towards an early advance, as most of the mills are well sold ahead. Prices are $1.65, usual average in carloads, and $1.75 from stock.

Scrap.—Demand is rather more than fair, and dealers report moderate sized sales of the higher grades at better figures. No. 1 railroad, $19; No. 1 forge, $18; No. 1 mill, $13; fish plates, $20.50; axles, $22; horseshoes, $18.50; pipes and flues, $11; cast borings, $7.50; wrought turnings, $9.50; axle turnings, $12.50; machinery castings, $12; stove plates, $8.50; mixed steel, $11.50; coil steel, $14.50; leaf steel, $15; tires, $15.50.

Old Material.—A prominent terminal Western road sold 1,000 tons of iron rails to a nearby consumer at $21.35, and holders are now stiff at $22.50. Old steel rails are in demand at $14.50@$16.50, according to length and condition. Old car wheels are selling in 100-ton lots at $16.50.

Louisville. Jan. 16.

(Special Report by HALL BROTHERS & Co.)

A little better inquiry is noticed for the past week and a greater number of orders have been recorded, but no large transactions have taken place. Prices have ruled weak, Grey forge still being offered on basis $9.50 Birmingham. Notwithstanding the money market is easy, conservatism prevails, no one caring to indulge too freely in anything, and buying is simply for actual needs. We quote:

Hot Blast Foundry Irons.—Southern coke, No. 1, $14@$14.25; No. 2, $13.25@$13.75; No. 3, $13@13.25; Southern charcoal, No. 1, $16@$17; No. 2, $15.50@$16; Missouri charcoal, No. 1, $17@$17.50; No. 2, $16.50@$17.

Forge Irons.—Neutral coke, $12.50@$12.75; cold short, $12.25@$12.50; mottled, $11.50@$12.

Car Wheel and Malleable Irons.—Southern (standard brands), $18@$18.50; Southern (other brands), $17@$17.50; Lake Superior, $19.50@$20.50.

Philadelphia. Jan. 21.

(From our Special Correspondent.)

Pig Iron.—Quite a number of small transactions have been closed within the last 48 hours, most of them, however, being for foundry iron in both brands. Offers were made yesterday and to-day for very large lots of forge iron, in some cases for Southern brands, and it is understood that between 9,000 and 12,000 tons in large lots have been already contracted for, most of it for prompt delivery. Price quoted, $14.25@$14.50. Small lots of very good forge have been sold for March delivery at $15. Bessemer is moving quite freely, and rumors to-day are to the effect that there will be higher prices quoted at a very early day, but buyers say an advance is improbable. The entire crude iron market is somewhat stronger.

Muck Bars.—For the first time in many weeks it can be stated that there has been more business done in muck bars than for some time back, but at the very lowest quotations which have been given for months past.

Steel Slabs and Billets.—A few more transactions have been closed within a day or two, and several more are likely to be closed before Saturday, the amount of which is not yet determined. Manufacturers are not anxious to sell large quantities of billets at present prices, and prefer to keep their customers supplied at current rates. The indications point to quite an activity in slabs and billets next week, and one or two parties think we are on the eve of a general improvement, but this is putting it, perhaps, too strong.

Merchant Iron.—To-day's reports from a number of interior points are quite favorable, but the business done is in small lots only. City mills are doing quite well, as are a number in the valley near hy, but it is not quite correct to say that there is a general improvement in bar iron. All sales are made at the lowest quotations for the past two or three months.

Nails.—The nail trade is said to be more active, but this is due to the fact that factories are turning out more stock. Whether they are selling their stock is another question.

Sheet Iron.—Sheet iron makers have booked several good sized orders for galvanized and heavy sheets. Several large buyers are in the market to-day, and will probably conclude to place orders before the close of the week. Very low quotations are given on large lots, but on small lots from mill and store there is a hardening tendency from recent quotations.

Wrought Iron Pipe.—There is but little activity in this branch. Tubes are doing well, and most manufacturers report an improved condition.

Plate and Tank Iron.—While the aggregate of business is not large, in fact, rather disappointing, the number of small orders is quite encouraging, and in most instances the light buyers will be heavier buyers before long. There is still a strong inclination to not buy more than sufficient to cover current demands. Quotations continue on the 1·90c. basis for tank. A good deal of boiler plate is being bought for prompt delivery; in fact, prompt delivery orders are the strongest feature of the market, and show that there is a good legitimate demand all around.

Structural Material.—Specifications are daily looked for for large quantities of bridge material for spring and summer delivery for both railroad terminal and bridge work. The small orders that are coming in are about up to the January average. No change in quotations. Beams, $3.10; tees, $2.50.

Steel Rails.—Brokers hear rumors of large transactions in other markets, but have very little to report concerning steel rails here. It is asserted that there are inquiries in this market for between 30,000 and 40,000 tons, but whether they are the same inquiries that have recently been made in Western markets we do not know. Quotations continue at $30@$31 for standing sections. A good deal of business is being done in lighter sections, and also in 80 and 90 lb. rails.

Old Material.—All the old iron rail stock that can be had will meet with ready buyers at about $21.50@$22.

Scrap.—Railroad scrap is very scarce, and there are a number of buyers waiting promised deliveries.

Pittsburg. Jan. 21.

(From our Special Correspondent.)

Business during the past week was not as active as in the preceding one. Consumers are evidently pretty well supplied with material, as our reports of large sales since January 1st indicate. While the market is certainly no better it would be unfair to say that it is worse, although some people are so disappointed that they are almost ready to declare that matters are not so promising as they were last week. More pig iron has been made during the past three months than ever before in the same time; yet, all things considered, a fair amount of sales are reported, principally for later deliveries. There were seven more furnaces at work on January 1st, 1892 than December 1st, 1891, but the weekly output remains about the same, viz., 188,082 gross tons. There is not enough unsold iron on hand, however, to cause any disturbance of the market, and it would take only a small increase in the demand to wipe out all the surplus.

A well informed Eastern dealer says concerning the situation: "Prices remain about the same, but there is a strong feeling that the market is heading toward better figures than have been realized for some time. Southern iron is moving actively in the Western markets, and a good deal of it is finding its way along the seahoard in competition with Northern iron. Current business in pig iron is largely in small quantities for early delivery, but there is more inquiry for prices for delivery three or four months hence." The sum and substance of the whole matter is that while business has not improved as decidedly as was expected, neither has it fallen off, nor has anything occurred to modify the favorable anticipations previously expressed. While consumers have a fair stock purchased, at the present rate of consumption the time is not far off when their supplies will need replenishing. Furnaces in this city and vicinity being well sold up, are not disposed to accept a decline, and, as a general thing, are holding out for previous prices. The Valley furnaces are reported well sold up and are running to their full capacity, prices being well maintained for spot and later deliveries.

New steel rails continue steady, with sales at the works at $30. Muck bar is dull and neglected; prices weak, but no lower. Steel slabs and billets are in moderate demand; the rate, $25 per ton, previously agreed on at maker's mill has been maintained. Bessemer pig is not so firm, last week's prices being shaded in some instances. Gray forge is weaker; we learn of sales 5@10c. below last week; on the other hand certain dealers refuse to make any concessions in order to effect sales. Steel wire rods have declined 50@75c. per ton. Scrap material is dull and lower.

Coke Smelted Lake and Native Ores.

3,500 Tons Bessemer, July, March	$15.65 cash
3,000 Tons Bessemer, City furnace	15.75 cash.
3,000 Tons Bessemer February, March	15.65 cash.
3,000 Tons Grey Forge, next 4 months	13 45 cash.
2,000 Tons Grey Forge	13.35 cash.
2,000 Tons Grey Forge, City furnace	13.50 cash.
2,000 Tons Bessemer	15.75 cash.
3,000 Tons Grey Forge at Valley furnace	13.00 cash.
1,000 Tons Grey Forge City furnace	13.50 cash.
700 Tons Bessemer July, March	15.75 cash.
500 Tons No. 2 Foundry, City furnace	15.00 cash.
500 Tons Bessemer	15.75 cash.
300 Tons White Iron, Southern	13.00 cash.
300 Tons White	13.25 cash.
200 Tons No. 1 Foundry	15.50 cash.
200 Tons No. 1 Foundry	16.00 cash.
100 Tons No. 2 Foundry	15.00 cash.
100 Tons No. 1 Silvery	17.00 cash.

Charcoal.

150 Tons Cold Blast	25.50 cash.
100 Tons Cold Blast	26.75 cash.
100 Tons No. 3 Mill	18.50 cash.
100 Tons No. 1 Foundry	20.00 cash.
100 Tons Warm Blast	19.50 cash.

Steel Slabs and Billets.

2,000 Tons Ste l Billets at Works	25.00 cash.
1,000 Tons Steel Billets at Works	25.00 cash.
800 Tons Steel Billets at Works	25.25 cash.
500 Tons Steel Billets at Works	25 00 cash.

Muck Bar.

1,000 Tons Good Neutral, Feb., March	26.00 cash
500 Tons Good Neutral, Feb., March	26.00 cash.

Ferro-Manganese.

150 Tons 80%, delivered	63 50 cash.
100 Tons 80%	63.00 cash.

Steel Wire Rods.

600 Tons American Fives, Feb., at Mill	33.50 cash.

Bloom and Rail Ends.

1,500 Tons Bloom and Rail Ends	18.00 cash

Skelp Iron.

700 Tons Narrow Grooved	1.62½ 4m.
400 Tons Sheared Iron	1.85 4m.
300 Tons Wide Grooved	1.65 cash.

Iron Ore.

50,000 Tons Bessemer Ore during 1892 at 50 cents advance over last year's prices.

Old Iron and Steel Rails.

1,000 Tons Old Iron Rails	22.00 cash.
700 Tons Short Pieces Steel Rails	17.40 cash.
500 Tons Mixed Lengths	17.15 cash.
500 Tons Old Steel Rails	17.50 cash.
100 Tons Old Steel Rails	18.00 cash.

Scrap Material.

325 Tons No. 1 R. R. W. Scrap, net	19 50 cash.
325 Tons Leaf Steel, gross	20.50 cash.
100 Tons Coil Steel, gross	19.00 cash.
100 Tons Soft Leaf Steel, gross	17.50 cash.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Jan. 16.		Jan. 18.		Jan. 19.		Jan. 20.		Jan. 21.		Jan. 22.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams													
Alice, Mont					1.50								100
Amador													
Atlantic, Mich													
Belcher, Nev													
Belle Isle, Nev													
Bodie Cons., Cal													
Bos. & Mont., Mont													
Breece, Colo													
Bulwer, Cal													
Caledonia, S. Dak													
Catalpa													
Chrysolite, Colo													
Colorado Central, Colo													
Commonwealth, Nev													
Comstock T. bonds, Nev.													
" scrip., Nev													
Cons. Cal. & Va., Nev			4.25				4 50				5 25		695
Crown Point, Nev					1.55						1 55		300
Deadwood, Dak	2 05	2.00									2 05		600
Eureka Cons., Nev			2 00										50
Father de Smet, S. Dak													
Franklin, Mich													
Freeland, Colo													
Gould & Curry, Nev	1.15		1.25						1.75				300
Grand Prize													
Hale & Norcross, Nev			1 00		1 15				1 40				400
Homestake, Dak											12 25		50
Horn-Silver, Utah							3.75				3.80		525
Independence, Nev													
Iron Hill													
Iron Silver													
Leadville Cons., Colo	.23	.22	.24	.20	.20		.20		.22	.20	.23	.22	14 900
Little Chief, Colo											.28		500
Martin White													
Minnesota Iron Co													
Mt. Diablo, Nev													
Navajo, Nev													
N. Belle Isle, Nev													
Ontario, Utah													
Ophir, Nev	2 80		2 90				3 30				3 50		400
Osceola											27.75		60
Plymouth, Cal													
Quicksilver, Pref., Cal													
" Com., Cal													
Quincy, Mich													
Robinson Cons., Colo											.50		1,100
Savage, Nev											1.75		100
Sierra Nevada, Nev	1 75		1.75				1.90				1.85		400
Silver Cord, Colo													
Silver King, Ariz													
Silver Mg. of L. V., N.M.													
Standard			1.25										175
Stormont													
Yellow Jacket, Nev	1 15		1.15						1.45		1 30		500

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Jan. 16.		Jan. 18.		Jan. 19.		Jan. 20.		Jan. 21.		Jan. 22.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Allouez													
Alta	60		.60		.65				70		65		1,000
American Flag, Colo													
Andes, Cal													
Astoria, Cal													
Augusta, Ga													
" bonds													
Barcelona, Nev													
Belmont, Cal									65		65		300
Best & Belcher, Nev			2 35		2 50				3 00		3.00		400
Bonanza King, Cal													
Brunswick, Cal	.08		07	.06	.05		.06	.15	06	.05	.05		8,000
Bullion, Nev													
Butte & Bost., Mont													
Castle Creek, Idaho													
Challar			1.00										200
Comstock T., Nev			16		.18				.23	18	.18	.17	5,100
Con. Imperial, Nev													
Con. Pacific, Cal													
Crescent, Colo													
Del Monte, Nev													
El Cristo, Rep. of Col													
Excelsior													
Exchequer, Nev					.60								100
Hollywood, Cal													
Huron, Mich													
Julia													
Kossuth													
Lacrosse, Colo													
Lee Basin, Colo													
Mexican, Nev	1.70		1 75		1 85		2.00		2 35		2.25		650
Middle Bar, Cal													
Monitor, Colo													
Mutual S. & M. Co., Wash													
Nevada Queen, Nev													
N. Standard, Cal													
N. Commonwealth, Nev													
Occidental, Nev													
Overman													
Phœnix Lead, Colo													
Phœnix of Ariz					.46	.45					.40	.39	.43	.40	2,400
Potosi, Colo					1.90								2.25		300
Rappahannock, Va													
S. Sebastian, S. Sal													
Santa Fe, N. M													
Scorpion, Nev	.35				40								200
Seg. Belcher, Nev	.90		.90										500
Shoshone, Idaho	.02												500
Silver Queen													
Sullivan Con., Dak													
Sutro Tunnel, Nev													
Syndicate													
Tornado Con., Nev													
Union Cons., Nev	1.45				1.55								200
Utah, Nev	.50		55		.50		.65				.65		1,300

Ex-dividend. † Dealt in in the New York Stock Ex. Unlisted securities. ‡ Assessment paid. § Assessment unpaid. Dividend shares sold, 21,055. Non-dividend shares sold, 21,150. Total shares sold, 42,205.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Jan. 15.		Jan. 16.		Jan. 18.		Jan. 19.		Jan. 20.		Jan. 21.		SALES.
Atlantic, Mich									11.50	11 00	11.25		113
Bodie, Cal													
Bonanza Development											.45		100
Bost. & Mont., Mont	37 50	36 25	38.00	36 25	37.50	37.13	37.50	35 63	37.50	37 13	37.50	35.00	3,100
Breece, Colo													
Calumet & Hecla, Mich	264		265		265		263½	262½			265	264	61
Catalpa, Colo													
Central, Mich													
Cœur d'Alene, Id	1.05												500
Con. Cal. & Va., Nev													
Dunkin, Colo					.40								100
Eureka, Nev													
Franklin, Mich	15 50		15.25										250
Honorine, Utah													
Horn Silver, Utah													
Kearsarge, Mich							12.50				12.00	11 50	255
Lake Superior, Iron					62.50								200
Little Pittsburg, Colo													
Minnesota Iron													
Napa, Cal									4.63		4.75	4.63	1,400
Ontario, Utah													
Osceola, Mich	28 00		29 50	29.00			29.00	27 63	28.00	27.50	27.50	26.50	1,395
Quincy, Mich													
Ridge, Mich													
Sierra Nevada, Nev													
Silver King, Ariz													
Stormont, Utah													
Tamarack, Mich			160		160		158				157	155	35
Tecumseh, Mich													

NAME OF COMPANY.	Jan. 15.		Jan. 16		Jan. 18.		Jan. 19.		Jan. 20.		Jan. 21.		SALES
Allouez, Mich									1.38	1.00	1.50		1,180
Arnold, Mich									.65				50
Aztec, Mich													
Brunswick, Cal													
Butte & Boston, Mont			15 50								15 75		150
Centennial, Mich	10.00		10.25		10.25	10.00	10.00		11.00	10.00	10.75	10 13	2,905
Colchis													
Copper Falls, Mich													
Crescent, Colo													
Dana, Mich													
Don Enrique, N. M													
Geyser													
Hanover, Mich													
Humboldt, Mich													
Hungarian, Mich													
Huron, Mich													
Mesnard, Mich													
National, Mich	1.25				1.25	1.00							475
Native, Mich													
Oriental & M., Nev													
Phœnix, Ariz													
Pontiac, Mich													
Rappahannock, Va													
Santa Fe, N. Mex											.27½		400
Shoshone, Idaho													
South Side, Mich													
Star, Mich													
Washington, Mich													
Wolverine	3.50										3.75		300

Dividend shares sold, 7,509. Non-dividend shares sold, 5,460. Total shares sold, 12,969

COAL STOCKS.

NAME OF COMPANY.	Jan. 16.		Jan. 18.		Jan. 19.		Jan. 20.		Jan. 21.		Jan. 22.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
American Coal													
Cambria Iron					74				74				65
Cameron Coal & I. Co													
Ches. & O. R. R													
Chic. & Ind. Coal R. R													
Do. pref													
Col. C. & I	37¾	37	37	36⅝	36⅜	35⅞	37¼	36¾	37¾	36¾	37⅜	37	7,850
Col. C. & Hocking C. I													
Consolidation Coal													
Del. & H. C	125⅜		125¼	124⅜	125	123⅝	127	124⅞	126¼	125	126⅜	124⅛	5,984
D., L. & W. R. R	140⅜	140	139⅝	138¾	139¼	138¼	140⅛	139⅝	142⅜	140⅜	143⅜	141	163,006
Hocking Valley			31	30	30	29⅝	30¾	30	30¾	30⅝	31⅛	30¾	2,326
Hunt & Broad Top	27¾		26¾										266
Do. pref	48⅜								46½				100
Illinois C. & Coke Co													
Lehigh C. & N	49		49	48¾	48¾	48⅛	49⅛	48¾	49¼	48¾			2,922
Lehigh Valley R. R	50⅜	50¼	50⅝	50¾	50¾	50⅜	50¾	50⅜	51	50¾			1,197
Lehigh & Wilk. Coal													
Mahoning Coal													
Do. pref													
Maryland Coal				24½		24½	25						300
Morris & Essex					144	143¾	143½		143⅜				143
New Central Coal													
N. J. C. R. R	113		113	112⅜	112¾	111⅜	115	112½	11 ¾	115	117¼	113¼	12,037
N. Y. & S. Coal													
N. Y., Susq. & West			117⅛	113¼	118¼	11	17⅛	113¼	113¼	113⅜	113¼		3,928
Do. pref			48⅜	47⅝	47¾	46⅛	48		49	48	48⅜		2,467
N. Y. & Perry C. & I													
Norfolk & West. R. R													
Do. pref			52⅜		51⅜	49¾	51⅛	50⅜			51		1,010
Penn. Coal													
Penn. R. R	55¾	55⅜	55⅜	55⅛	55⅜	55	55⅝	55⅛	55⅜	55⅛			9,441
Ph. & R. R. R	41⅜	40⅝	40⅝	38⅝	39	38	41	39	41⅜	40⅜	41⅛	40⅝	366,379
Sunday Creek Coal													
Do. Pref													
Tennessee C. & I. Co	42¾	40⅝	42¼	41	41⅛	40	42⅜	41¼	42¼	42⅜	42¼	41⅛	7,443
Do. pref													
Westmoreland Coal													

Total shares sold, 526,864.

San Francisco Mining Stock Quotations.

NAMES OF STOCKS.	CLOSING QUOTATIONS. Jan. 15.	Jan. 16.	Jan. 18.	Jan. 19.	Jan. 20.	Jan. 21.
Alpha						
Alta	.45	.50		.55	.60	.55
Belcher						
Belle Isle	.25	.30		.25	.25	.25
Best & Belcher	2.05	2.20		2.55	2.90	2.85
Bodie	.65	.60		.55	.55	.55
Bulwer	.45	.45		.40	.35	.40
Challar	.95	.90		1.35	1.45	1.30
Commonwealth	.20	.20		.20	.20	.20
Cons. Cal. & Va	3.70	3.90		4.25	4.80	4.80
Cons. Pacific						
Crown Point	1.24	1.40		1.50	1.55	1.40
Del Monte, Nev						
Eureka Consolidated					1.50	1.50
Gould & Curry	1.05	1.10		1.50	1.65	1.60
Hale & Norcross	.80	.85		1.10	1.25	1.65
M. White						
Mexican	1.55	1.60		1.80	2.20	2.10
Mono	.80	.80		.65	.65	.60
Mt. Diablo				1.65	1.95	
Navajo	.10	.10		.10	.10	.10
Nev. Queen	.10	.10		.10	.10	.10
N. Belle Isle	.25	.25		.25	.25	.25
N. Commonwealth						
Ophir	2.65	2.70		3.15	3.45	3.30
Potosi	1.65	1.75		2.05	2.00	2.00
Savage	1.30	1.35		1.55	1.65	1.60
Sierra Nevada	1.60	1.60		1.75	1.95	1.70
Union Con	1 30	1.35		1.55	1.95	1.65
Utah	.40	.45		.45	.60	.55
Yellow Jack	1 00	1.05		1.25	1.30	1.20