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CONTENTS.

Table listing articles and their page numbers, including 'The Production of the Calumet & Hecla Mine in 1891', 'The Broken Hill Proprietary Company', 'Prizes for Essays on Good Roads', etc.

* Illustrated.

Table listing market information for Mining News, Foreign, Mining Stock, and Metals, including locations like Alabama, California, Colorado, etc.

OWING to the refusal of the Calumet & Hecla Mining Company to furnish official reports, the output of copper by that company in 1891, as published by us on January 2d, was, we find, incorrect, being somewhat overestimated. In the next issue of the ENGINEERING AND MINING JOURNAL we will give the correct figures, which will reduce the estimated consumption of copper in this country as well as the production.

THE BROKEN HILL PROPRIETARY COMPANY.

The output of the Broken Hill Proprietary Company, Limited, of New South Wales, Australia, in 1891, was 253,864 tons of ore, which yielded 39,479 tons of 2,240 pounds of silver-lead bullion and 9,599,932 ounces of silver; the average yield of lead per ton of ore was 15.55 per cent., and of silver, 37.8 ounces. In 1890 the output of the company was 7,785,000 ounces silver and about 32,000 tons of lead. This shows a very material increase in production during the past year; yet the expectations that were entertained at the beginning of the year have not been realized. It was thought that an output of 16,000,000 ounces silver might be attained in 1891, provided the water supply was ample. Much trouble has been experienced, however, concerning the latter point, and it is due to this reason that the production of this famous mine has not shown still greater increase during the past year. The company has paid its usual monthly dividends of £96,000 throughout the year, making the total paid to date £3,400,000, in addition to which £592,000 has been distributed to the shareholders as part of the proceeds derived from sale of mineral land to subsidiary companies.

A late report from the mine states that the water difficulties are serious, but there is no probability of entire stoppage of the works, and large quantities of ore are being sent to the coast for treatment. The most serious difficulty the future of the company presents is undoubtedly the decline in the yield of its ore and the increasing proportion of zinc and lead sulphides which it contains. The average value of the ore in the half year ending November 30th, 1891, was £7 18s. 1d. per ton, against £8 3s. 7d. in the preceding half year and £9 7s. 7d. in the last half of 1890. The mine is following the course of the great Leadville, Colo., bonanzas, and is getting down into the poorer sulphide ores, and its output of lead and silver will probably soon commence to decrease. In a word this wonderful mine has probably seen its best days.

PRIZES FOR ESSAYS ON GOOD ROADS.

There is no other problem in engineering in this country at the present time that has so direct and important an influence on the prosperity of the country as the improvement of our country roads.

It is quite possible to show that the saving which our farmers, miners, and many other classes would realize by the improvement of roads would run into hundreds of millions of dollars annually, and if this saving could be applied for only five years to the improvement of the highways this country would gain the control of many markets which are now closing against our breadstuffs, and there would be a great reduction in the costs of supplies of many kinds and in the cost of marketing the ores of many of our mining camps. The ENGINEERING AND MINING JOURNAL therefore warmly supports any means that seems likely to awaken interest in this important problem.

The Pope Manufacturing Company, of Boston, Mass., offers to give one hundred bicycles to the authors of the best one hundred essays on good roads. The circular says: "These prizes are to be apportioned among all the States of the country, at least one to each, one to the District of Columbia and the balance according to population. Any phase of the subject may be treated of in these essays, but no essay should be less than 500 words in length, and it must be published in some paper or magazine or other periodical before being presented, and must be submitted to the Road Department of the Pope Manufacturing Company, 221 Columbus avenue, Boston, Mass., in its published form in the paper in which it was first printed. The standing and character of the paper will have weight in the final decision. The following additional points will be considered: General adaptation to the subject; practical value of the suggestions; evidences of study given to the question; style and clearness of diction. A marked copy of the paper or magazine containing the article must be sent, with a sealed envelope containing the name and address of the author and the name and address and date of the paper in which his essay was published; and with a statement from the principal, teacher or professor of the author stating that he is a student of a certain school, academy or college. All essays must be in the possession of the Pope Manufacturing Company before May 1st, 1892.

Col. ALBERT A. POPE, the president of the Pope Manufacturing Company, is an enthusiastic supporter of the movement for better roads. He was active last year in the attempt to secure the passage of a bill through the Massachusetts Legislature for the improvement of the roads of that State and, besides interesting himself in the matter in this general way, has undertaken to teach the people of the country the advantages of good roads and spread information concerning their construction and maintenance. He founded the Department of Road Construction in the

Massachusetts Institute of Technology, of Boston, endowing it with a considerable sum for its maintenance, and is now taking these means to arouse popular interest in the subject. We are compelled to admire the shrewdness with which he does it, for there is no other way of reaching the great body of the people, who are the ones to be converted, that is so effective as by having a mass of literature upon the subject printed in the local papers all over the country.

The ENGINEERING AND MINING JOURNAL offers the use of its columns to contestants for the Pope prizes, and it is needless for us to point out the prestige which the authors will win from having their essays printed in a journal of such high technical standing, influence and wide circulation.

THE ELMORE COPPER DEPOSITING COMPANY.

Another Elmore scheme has been launched on the British market. This time it is Elmore's American & Canadian Patent Copper Depositing Company, Limited. Its capital is £200,000, divided into 65,000 priority shares and 35,000 deferred shares of £3 each. The whole of the deferred shares were taken by the vendor, *i. e.*, Elmore's Foreign and Colonial Patent Copper Depositing Company, Limited, in part payment of the purchase money, and the 65,000 priority shares were offered for subscription at par. The priority shares are entitled to a cumulative preferential dividend of 30 per cent. per annum and half the remaining divisible profits, the balance going to the deferred shares. The board of directors contains the names of three directors in other Elmore companies.

According to the prospectus, the company has been formed to acquire the Elmore patents for the United States and the Dominion of Canada. In a report recently made by Mr. WILLIAM ELMORE to the board of directors of Elmore's Patent Copper Depositing Company, Limited, as the result of his experience at the works at Leeds, England, as managing director, he states that over £100,000 net profit per annum can be obtained from a 40 ton plant, and that the cost of manufacture is about $\frac{1}{4}$ d. per pound weight of finished goods. The factory in France, which is said to be capable of producing 80 tons per week, is just completed and the manager states that the demand far exceeds the total capacity of the present works. The quality of tubes manufactured under the Elmore system is referred to. It is not the intention of the American & Canadian company to work the process itself further than by the erection in New York of a plant of sufficient size to demonstrate the merits of the invention. As soon as this plant has been erected it is the intention either to dispose of licenses for the various States for a fixed sum in addition to a royalty, or to dispose of the entire patents for the United States to an American company for a large sum in cash and a proportion of its share capital. The patents and all improvements are to be acquired by the American & Canadian company for £110,000 in cash and £70,000 in deferred shares.

The subscription books opened on February 1st and closed on the same day. According to one of our English contemporaries, the applications for shares were numerous, and allotments were made to nearly 800 persons. Such are the statements made by the company.

We referred editorially to the Elmore process and the scheme for introducing it in the United States in our issues of March 21st, April 18th and June 20th, 1891. We then took the position that in view of certain defects in the process certified to by competent and eminent experts, it would be well for prospective investors to await a practical demonstration of the claims of its promoters before embarking in the venture; and we called attention to the odor of stock jobbing which characterized all the Elmore schemes. Now, after another year of vain waiting for "practical results," we have no reason to change our opinion of the enterprise. The technical merits or demerits of the Elmore process were ably discussed by correspondents, among whom was the late ALEXANDER WATT, a recognized authority on electro-metallurgy, in the ENGINEERING AND MINING JOURNAL (January 1st, and June 30, 1891). The company's own reports are convincing demonstrations of the wisdom of our warning.

Elmore's Patent Copper Depositing Company, Limited (announcing a revolution in the copper manufacturing industry!), was issued on January 18th, 1889, taking over patents that had been granted at various intervals since 1884. It was estimated in the prospectus that the machinery could be completed "and the factory commence profitable work in three months." The first balance sheet of the company was issued on July 26, 1890, or eighteen months later. It accounted, as at June 30, 1890, for the expenditure of £19,350 19s. 9d. on buildings, plant, machinery, etc., and £8,317 14s. 3d. for raw material and sundry stores. There were no items on the credit side to show that any profit had been earned at the works. The balance sheet for the year ending June 30, 1891, was not issued until December. It showed credit balances on June 30th of £14,261 17s. 10d, made up of £5,000 royalties received in advance on copper sheets, £8,558 7s. premium and profit on land, and profit and loss of £703 10s. 10d. It was stated, however, that the company had only been able to manufacture small quantities of articles at the date of the making up of the accounts, work on a large commercial scale not having been then commenced. The cost of

manufacture was stated to be only $\frac{1}{4}$ d. per lb. weight of finished goods. The profits of the works as now completed were predicted at over £45,000 per annum, or 30 per cent. upon the capital of the company.

That is the showing after two years' work, and seven years out of the short life of a patent.

At the present time the nominal capital embarked in these companies is as follows: Elmore's Patent Copper Depositing Company, £200,000; Elmore's Wire Manufacturing Company, £300,020; Elmore's Foreign and Colonial Patent Copper Depositing Company, £120,000; Elmore's Austro-Hungarian Patent Copper Depositing Company, £200,000; Elmore's French Patent Copper Depositing Company, £200,000; Elmore's American & Canadian Patent Copper Depositing Company, £200,000; total, £1,220,020, of which (excluding the most recent organization) £860,020 has been allotted.

The practical value of the Elmore patents should have been, and no doubt was, determined three years ago. Certainly nothing has been shown to justify the issue of \$5,000,000 or any other amount of capital. The two parent companies have paid dividends out of the proceeds derived from the sale of the patents to the subsidiary concerns, but ultimately some one will have to earn profits in legitimate manufacture, and it has not yet been demonstrated that this can be done. On the whole, there has thus far been no evidence submitted to the public that changes our opinion that this concern seems to be exploiting the stock market and not manufacturing serviceable tubes, and that it is an excellent thing for American investors to let alone.

SHOULD WE HAVE A GOVERNMENT TESTING LABORATORY?

A bill has been introduced in the House of Representatives and referred to the Committee on Manufactures appropriating funds for investigations and tests of American timber, setting forth the enormous waste of valuable material through ignorance of the true value and strength of American timber, and calling attention to the fact that the thorough examination and elaborate tests of our timber undertaken by the Forestry Division of the Department of Agriculture have progressed very slowly, and are now entirely discontinued on account of deficient appropriations for the work. The bill asks for the appropriation of \$40,000 for the continuance of these investigations and the speedy publication of results, the money to be expended under the direction of the Secretary of Agriculture through the Forestry Division.

The work that has been done by the Forestry Division under the efficient direction of its chief, Mr. B. E. FERNOW, is well known by all engineers and the value of the results obtained is recognized. They promise to be the most important tests of timber yet undertaken anywhere and will fitly supplement the work so ably commenced by Prof. LANZA, at Watertown, Mass. Trees of each species for test material are taken from a number of localities of different soil and climatic conditions, the selection being made by experts. Disks of a few young trees as well as limb wood are also collected for biological study and to ascertain their physical properties, their macroscopic and microscopic nature, rate of growth, etc. The logs are shipped to the St. Louis test laboratory, where their strength, green and after seasoning, is determined.

Notwithstanding the obvious advantages and the urgent need of such tests to the engineering profession particularly, and while recognizing the eminent fitness of the officers of the Forestry Division to conduct them, we still believe that such work should be done by the citizens interested rather than by the Government. Such work as this does not properly constitute a function of a republican government and these should be limited as closely as possible to doing that which the citizens are unable to do for themselves. Much scientific work, such as the collection of interstate and international statistics, geological surveys of the public lands and the coast and geodetic survey, must obviously be performed by the central Government, but work which is of interest to but a portion of the people and which can be conducted by private or by voluntary public enterprise should not, in our opinion, be performed by the Government at the public expense. The very foundation of free republican government is in the self-reliance of the citizen, and the looking to the Government to do what the citizen can do for himself is destructive of that foundation.

Under the initiative and supervision of our many excellent engineering societies a general testing laboratory could well be established and supported, where investigations and tests of all kinds could be made for those interested, whether individuals, corporations or the Government itself.

If, as is estimated, the railroads spend \$30,000,000 a year for railroad ties and a thorough investigation of the properties of different woods and of methods for their preservation would lead to a possible saving of one-fourth this annual cost, the railroads could well afford to contribute \$500,000 a year to the support of such a laboratory. Yet this is but a single instance in which means for such work could be provided.

The Government might also contribute annually a considerable sum to such a public laboratory for making the tests of material used in the navy and ordnance departments and in the public works. No matter how desir-

able the object in view may be, the ENGINEERING AND MINING JOURNAL altogether opposes the turning over to the Government to do, that which the citizens can properly and quite as efficiently do for themselves.

We shall be pleased to receive communications on this subject and open our columns to its discussion.

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.]

Geological Survey of Missouri. A preliminary report on the coal deposits of Missouri from field work prosecuted during the years 1890 and 1891. By Arthur Winslow, State Geologist. Published by the Geological Survey, Jefferson City, Mo., 1891. Pages, 226. Illustrated.

Money, Silver, and Finance. By J. Howard Cowperthwait. Published by G. P. Putnam's Sons, N. Y., 1892. Pages 242.

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 Vulture Mine and Prof. W. P. Blake.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: Your use of my name (February 6th) in the same article with your criticisms of the transactions under a contract between Ex-Governor Tabor, of Colorado, and the Kaiser Gold Mines, Limited, of London, is a great injustice, for I was not in any way a party to that contract and have no knowledge of or participation in anything that was done under it. It is true you do not make any such direct charge, but there is a reflected odium which should not be thrown upon me.

Your direct statement, however, that the two experts who reported upon the property were Cyrus Gribble, M.E., and myself would lead any one not aware of the facts to believe that I examined the property for Governor Tabor in the usual manner preparatory to a report, which is not the fact. I did not examine the property for Governor Tabor, or for others. The business came to me in London by way of a reference of the manuscript report, maps and sections made by Mr. Gribble for my opinion and explanations of them, it having been made known to the promoters that I had knowledge of the property, and Mr. Gribble, whom I never met, had been robbed and murdered on his way from the mine, and no one could be found to explain his drawings. I accepted this professional work, relying largely upon my knowledge of the Vulture mine under its former owners, and having more than once pointed out where dislocated portions of the vein could be found. With this knowledge, and the internal evidence of Mr. Gribble's report, I had no hesitation in deciding that he had made an honest statement according to his light, and I so reported to the promoters. But as I had not seen the mine for three years, during which it had been actively worked (which also was fully explained to the promoters), I could not give any opinion as to the quantity and value of the ore left in the mine. Mr. Gribble's figures may have been too high, but his valuation of the ore at about \$7 per ton, if I remember correctly, was not extravagant or improbable, according to the general knowledge and belief regarding the average of Vulture ore, and its former much higher record.

My own opinion of the property was asked and given, together with an explanation of the system of faulting planes which had in the past given so much trouble, and, at times, uncertainty, of the future of the mine. In Mr. Gribble's description, some of these faulting planes, or slips, were referred to as "barren bars," he probably not recognizing their true character, but showing to me that his description had been made with care and honesty. Justice to his name impels me to state that his report was by no means an "unfounded report," as you characterize it, if by this you mean that the mine had no value worthy of attention or a report.

Whether my opinions or advice had anything to do with the provisional purchase under a six months' working option I shall not say. The contract was made after I left England, and my connection with the matter had ceased. It seemed to me to be a prudent business transaction on the part of the buyers, for in a six months' examination and test they could become fully informed as to the value of the property. The practical outcome and result of Mr. Gribble's report, and of my opinion and advice, was the six months option by which the buyers took upon themselves the onus of determining the value of the property, and whether they would buy it or not. The responsibility of the experts there ceased.

Of what has since happened I cannot express any opinion for want of knowledge, not having been at the mine or mill for five years or more, and not having had any communication with Governor Tabor or others regarding it, but if there has been any such effort as you describe to deceive the buyers it was not only criminal but very foolish, and deserving of all the censure, and more, than you have given it. While I sincerely sympathize with every effort to expose and stop fraudulent transactions in mining matters, extreme caution is necessary to avoid injustice to innocent parties and to the property involved.

SHULSBURG, Wis., Feb. 15, 1892.

WILLIAM P. BLAKE.

Alaskan Mines and Mining.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: As the traveler sails along the inside passage of southeastern Alaska he can see a continuous line of sawtoothed, abrupt, towering snow-capped peaks, sometimes too steep for even snow to rest, separated by immense glaciers. This wall of granite is the boundary line between the British and American possessions; on our side the ground descends abruptly to the salt water, which is cut up into innumerable channels by very mountainous islands. The rock formation of this section belongs mostly to the older era, the rock being highly metamorphic and greatly contorted. The Silurian rocks are hardly apparent, but there are small areas of the Carboniferous, while farther to the westward still newer

formations exist. Our interests are, however, with a belt only a few miles wide, consisting mostly of schists, and occurring adjacent to the granite, forming the coast slope, and which also includes some of the islands. It extends about 50 miles northwest of Juneau and about 75 miles southeast. To the south of this section is the Stickun District, and far to the north lies the great Yukon country.

This mineral belt has a very rough and broken surface and is everywhere crossed by deep gorges, which would lead one to suppose that its geology would be an open book; but such is far from the case, owing to the heavy growth of timber and underbrush on the lower and the moss and lichens on the upper slopes, and a tangled mass of devil's clubs and ferns everywhere. Along this whole coast line the only means of travel is by water and on foot. The creek beds and the mountain tops are the only places where the formation can be studied, making it very difficult for the prospector. Every creek shows more or less signs of mineral, and often very good gold or silver float rock will be found, as well as free gold in the gravel, and yet it will be impossible to locate the source of this ore. For the past fourteen or fifteen years placer mining has been carried on very successfully at several places, and much time and money spent prospecting for quartz, but only a few good claims have been discovered, and these, with very few exceptions, have had but little development work done on them. There are twelve districts that have shown up ore deposits of merit from James Bay on the north to Shuck Bay on the south, including Berner Bay, Salmon Creek, Silver Bow Basin, Sheep Creek, Douglas Island, Admiralty Island, Taku, Suitsisham Bay, Argenta Basin and Sum Dum Bay.

The most important of these is Douglas Island, where is located the great Treadwell gold quarry with its 240-stamp mill and large chlorination works. Nearly \$90,000 worth of gold was washed off the surface here, and no importance placed upon the immense body of quartz which was finally purchased for \$400. This ore deposit is a big blow-out of quartz with feldspar and pyrites, and occurs in a talcose schist formation. The ore runs from \$3 to \$4 per ton, mostly in free gold and occurring in a finely divided state in the pyrites. The annual output of this mine is about two thousand times the amount paid for it. The Mexican mine adjoining the Treadwell takes in most of this deposit not owned by the latter.

The second district in importance is Silver Bow Basin, where there is a considerable belt of talcose schists, thickly interspersed with segregated deposits of quartz, carrying coarse free gold with sulphurets of iron, lead and zinc. There are four mills here—the 10-stamp mill of the Eastern Alaska Mining and Milling Company; the 10-stamp mill of the Taku Consolidated Mining Company; the Webster 5-stamp mill, and the Dodge patent pulverizing mill of Mr. Archibald Campbell. This district has in the past been quite productive in placer gold, about \$500,000 having been taken out in the ten years since Juneau was settled. It is now the scene of action of the big placer scheme of the Silver Bow Basin Mining Company, whose operations the ENGINEERING AND MINING JOURNAL has already exposed.

The Schuck placers have yielded between \$50,000 and \$60,000 in gold. This was mostly taken out previous to the discovery of Silver Bow Basin and created considerable excitement 14 years ago, but the gold was so scattered that few made any money out of it. The Schuck Bay Placer Mining Company, Mr. John A. Bernhardt, promoter, has taken up the two basins and most of the creek and has started another big placer scheme. A tunnel was run last winter 800 ft. to tap the lower basin about 60 ft. deep, and a large hole was washed out in the loose gravel with which the basin is filled. During this time several caves occurred, and finally the tunnel was effectually blocked so that operations had to be suspended last season before they had made a clean up. It will probably be opened again the coming season, but at an expense almost equal to the first opening, and with a considerable loss of gold. Such management is not calculated to bring the mining industry of Alaska to very favorable repute with the investing public. This mine would with proper management from the outset have probably returned its owners some profit, but with double expenses for opening and much loss of gold, besides heavy outside expenses, the outlook is not very flattering, and will tend to further estrange legitimate investors from Alaskan mines.

About ten miles from Schuck is the Sum Dum Bay district, where the mineral is much more concentrated, and several very promising veins have been found, although there is little or no placer ground. Only one stream has been worked, and that almost under a glacier, which here comes down quite close to the bay. On the southwestern side of the bay the best veins are found. They carry both gold and silver. The Bald Eagle group of claims has had some little development work done on it, and is showing up a fair-sized vein of heavy sulphuret ore which assays well. From this bay, and for a distance above Suitsisham Bay, a limestone formation exists, alongside of which is a black slate belt, in which considerable silver ore is found. In this belt lies Argenta Basin, at which the ore is a rich gray copper, but no large veins have as yet been uncovered.

In the Suitsisham Bay district are several varieties of ore. A large belt of hornblende iron rock is observed, which carries a small amount of gold. Several small veins of schist rock carrying pyrites and gold and small quartz veins. One of the richest veins yet found in the country was discovered there last fall, but it appears to be very small.

Near Taku the iron belt again shows up and then the silver comes in again, this time as a sulphide of silver and in larger veins, but rather thinly mineralized. These veins mostly occur along a greenstone formation. A few miles south of Juneau is the Sheep Creek district, crossed by a gold belt and a silver belt. The gold belt resembles Silver Bow Basin and, although there are numerous locations, there have been no mines opened up. The silver belt has made a better showing, and the success of the Silver Queen Mining Company's work is being anxiously awaited. It has a 10-stamp mill and has stoped considerable ground, sorting the ore and concentrating the low grade stuff. The ore is galena, brittle silver, native silver, pyrites and zinc blende. The quartz varies in width from one to three and four feet and the quality of the ore is good enough to give good results with practical management. Indications, however, seem to point to a lack of knowledge of economic mining, and the continual loss of ore in the stopes, on the dump and in the tailings which seriously affected the profits last season.

The Salmon Creek district extends from Gold Creek to Lemon Creek. A large vein of low grade gold ore has had considerable development

done on it at several places, showing that it crosses the whole district. There is considerable placer ground in this district from which, however, the miners have made small wages only. Montana Creek has paid a little better.

The Berner Bay district, embracing the Seward City mines, is full of quartz lodes and can show up some of the finest specimens of free gold ore in this country. The veins are very irregular and very irregularly mineralized. According to the showing made last winter by the syndicate, of which Mr. J. A. Bernhardt was the promotor, about \$40,000 was spent in development work and \$10,000 on the bond, under the inefficient direction of the German "expert," who came out to take charge, and not enough ore was taken out to run a 3-stamp mill.

The James Bay district needs more development before much can be said about it, except that good galena silver ore is found there.

Admiralty Island is of a different formation; it is a few miles to the westward of the one in which the other districts lie, and in proximity to a porphyritic granite belt. There are several promising claims, and one mine. The Willoughby mine has several parallel fissure veins cutting directly across the strata of the silicious mica schist in which they occur. The ore is a quartz with sulphurets of iron rich in gold. This mine has been mentioned too often in the ENGINEERING AND MINING JOURNAL to need further mention now.

On the southwestern part of this island are the coal veins spoken of in the ENGINEERING AND MINING JOURNAL in a recent issue. A few isolated spots where small bodies of ore have been found complete the list for the section around Juneau. To the westward may be mentioned the black sand diggings at Lituya Bay, the Copper River country of which the name is about all we know, and at Cook's Inlet the large beds of lignite coal and a few placer deposits, while still further west a few silver and gold mines have been worked to some extent. W.

ALASKA, January, 1892.

The Cost of Producing Copper.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: An interesting editorial in the ENGINEERING AND MINING JOURNAL of February 6th, 1892, on "The Cost of Producing Copper" will attract the attention of investors as well as of members of the profession. There is a widespread belief in the community that the cost of producing copper is far less than the ordinary market price of that metal; and that even with the low quotations ruling this season, all the great mines are making huge profits constantly, while the smaller ones are at least obtaining a fair equivalent for their labor and investment.

Those who are practically engaged in the production of this metal well know that this impression is by no means a correct one, for although in a few instances copper can be made at such a cost as to leave a fair margin above the actual cost of production, even at the present low quotations, yet, as I propose to show, the mere mining and smelting of the ores and refining and selling of the metal are very far from being all the items that should be charged against the cost of production.

But how are we to arrive at this item? It is by no means so simple a matter as it might at first appear. For even if we had full access to the detailed accounts of the great mines, it would still be impossible to estimate the true cost of production, and this from the difficulty and even impossibility of knowing what portion of the very large sums usually expended every year in construction and repairs and opening new ground to charge against the copper produced that year.

For instance, the vein may have been worked on an incline for many years, until its change of pitch and other circumstances imperatively demanded the sinking of a new perpendicular shaft to facilitate rapid hoisting. This is a very expensive undertaking, reaching with its equipment, into the hundreds of thousands of dollars as likely as not. How much of this expense shall be charged against the copper produced during the time the shaft was sinking, and how much shall be charged against the production of the years yet to come, each one of which is pretty sure to bring with it its own extraordinary and exceptional item of cost?

Again, and this is a most important consideration affecting every mine in the world and becoming more and more a necessary matter for consideration as the magnitude of our mining enterprises and their consequent capitalization increase. How large a proportion of the yearly product must be put aside as a sinking fund to offset the progress of the mine toward absolute extinction which is bound to come within a certain time, and that a not very remote time, as mines are worked at present. A generation or two ago, when even the most prominent mines were worked on a scale that would now seem very diminutive, this point was not of such importance. The investors could feel tolerably certain that the ore supply would outlast their day, and probably that of their immediate heirs, and human philosophy is sufficiently advanced to be comparatively satisfied with such provision for the future, especially if present returns be satisfactory.

But with steam-drills, dynamite and electric blasting; with hoisting engines of 3,000 H. P. and stamps of 150 tons capacity each, and smelting furnaces of equal magnitude, it is scarcely possible for any single mining enterprise to have a very long duration, and it is only in the most exceptional cases that this matter of complete exhaustion of the mine and consequent comparative worthlessness of plant and smelter has not a direct and immediate bearing on the pocket of the investor.

But not only have the promoters and directors of mining enterprises failed to allow for the exhaustion of the mine in proportion to the amount of ore extracted from it, but in most cases they have pursued the still more dangerous policy of treating the exceedingly costly mining and metallurgical plants as though they were a permanent investment, subject only to the ordinary wear and deterioration of regular manufacturing enterprises instead of depending for almost their entire value on the life and existence of the mine.

No more notable examples of such a state of affairs can be cited than the group of mining companies which owned the choicest portions of that vast gold and silver deposit known as the Comstock Lode.

The unfortunate conditions just mentioned are, perhaps, more accentuated in the case of the Comstock Mining Companies than they ever can be again in the United States, owing to the unwise mining laws of those days by which each mining claim was limited to 100 ft. in length on the course of the vein. Indeed, owing to the divisions of single claims between partners and the existence of occasional short, originally unclaimed, gaps between the regular locations, some companies could obtain

only 33 ft. on the lode, or even less. Even a single foot on the more valuable portions of this great deposit was worth a very large sum; it and the extravagant ideas of the owners magnified this value to an extent that forbade the consolidation of the different, though neighboring, interests that would have been so profitable to them. The inevitable result, therefore, was a multiplication of shafts, hoisting works and plants with their expensive appendages of directors, superintendents, mining captains and staff. I have made a rough estimate of the amount of money that was thus unnecessarily expended on plants, and at the lowest figure it greatly exceeds the amount that the stockholders have received in dividends.

Although the peculiar evil mentioned in connection with the Comstock has been mostly obviated by the modern tendency toward consolidation of interests, yet the same evil is still found in the vast amounts invested in plant and the rapidity with which this item becomes worthless as the ore is extracted. I dislike to refer to individual cases, but stock companies are public property, and are fully aware that all their doings must sooner or later become known to the world.

No more striking instance of the enormous ratio of expenditure to intrinsic value of property can well be cited than the Anaconda, of Butte City, Mont. The owners of this property are noted mining men who bought the Anaconda for a silver mine and were accidentally drawn into copper smelting. Everyone knows the condition and probable future of the Anaconda. A vast fissure cutting boldly through the highly metamorphosed rocks of the district, and originally filled with a comparatively low grade argentiferous pyrites carrying a small percentage of copper. Decomposition has resulted in dissolving out the copper and iron from the upper portion of the vein, and redepositing it within a narrow zone bounded by the present drainage level of the neighboring valleys toward the surface and by the ancient drainage level in the depths. The silver was not leached out with the copper, but remained as a free milling silver ore containing 20 ozs. or 30 ozs. per ton.

Within 300 ft. from the surface the copper zone was reached, and here within three or four years man wrested from Nature the results of thousands of centuries of solution and redeposition. All the copper that originally belonged in the upper 300 ft. of this vein, together with an infinitely greater amount that was derived from the still higher portions of the lode that existed before the cutting down of the mountain to its present level—and the amount of detritus that fills the valley below proves this denudation to be very extensive—has been dissolved and redeposited in the vein at a lower level, thus forming the wonderfully rich purple ore that at once placed Butte at the head of the world's producers of copper. The Anaconda claim covers those portions of the lode where the fissure is the widest and the conditions governing the concentration of the copper seem to have been the most favorable.

Few people, apart from those living in Butte during the halcyon days of this mine, are fully aware of the extreme size and richness of the vein at some points. I have seen a stope in which was blocked out by means of levels and winzes, a mass of almost pure copper glance, 12 ft. wide, 80 ft. long and 40 ft. deep. This sulphide of copper was almost free from gangue, and so exactly resembled the ordinary "white metal" as tapped from a reverberatory furnace, that my smelter foreman—as good a judge of furnace products as one can often find—absolutely refused to believe the sample of this ore that I showed him to be a natural product.

Although it was obvious to every one familiar with the copper mines of the world that these rich altered ores could only occupy a limited zone, and were certain to be followed in depth by the ordinary low grade pyrites that, when unaltered, is found to be pretty much the same thing all over the world, yet the preparations for the treatment of these ores were as extensive and costly as though they were expected to last indefinitely. An enormous smelting plant was built on the late English system of small reverberatory furnaces, smelting 12 or 14 tons a day, and minute calciners, scarcely larger than a single hearth of the modern ones.

This was scarcely completed before it was found that the smelting plant was totally unsatisfactory and unsuited to the local conditions. After the immense expense that had been put upon it, the metallurgical world was astonished to see it almost completely torn down and rebuilt upon more modern lines. All this great outlay could have been avoided by a little care and judgment in the first place.

The present Anaconda works are reasonably well adapted to the work they have to perform. But their capacity is so enormous, and they have cost so much, that no ordinary mine of group of mines can expect to last long enough to supply them for more than a comparatively short time. When the mines that supply them are exhausted what will the plant be worth? Assuming the profitable ones to last the longest possible time that the most sanguine miner can expect, it is doubtful if the entire profits of the company can pay a reasonable annual interest on the cost of these works, and also provide a reasonable sinking fund to repay the cost of the works when the mines are exhausted. Some idea of the magnitude of this plant may be realized from the statement that the calcining plant alone embraces some 156 of the new large sized Brückner cylinders, which cost, set up, between four and five thousand dollars apiece.

The other great copper mine of this country is the Calumet & Hecla. The amount of money invested there in plant is something enormous, but the exceptional extent and condition of the mine seems to warrant a greater expenditure than common.

Yet there is no doubt that vast sums have been squandered on machinery and plant, and there is little doubt that if the ore were only half as rich as it is, that the cost of producing copper therefrom would be considerably reduced. Although the conditions are somewhat different between the Calumet & Hecla and the neighboring Atlantic mine, yet the cost of labor and material are identical; and, when one reflects that the latter mine has paid tolerably regular dividends on a yield of some three-quarters of 1%, it would seem peculiar to the uninitiated that with the enormous production of the Calumet & Hecla—some 3,000 tons of 4% ore per day—the margin of profit per ton is very much smaller than the Atlantic mine, in proportion to the yield.

The stockholders of the Calumet & Hecla are kept in comparative ignorance of the details of the business at the mine. The names of the directors and officials of the mine are a sufficient guarantee, to most Bostonians at least, that the management of the company's business is honest and genuine; but no one doubts that a vast amount of money has been unnecessarily expended in the management of this extraordinary property. The want of an adequate sinking fund to represent the lessening value

of the mine is, at least, partly replaced in the case of the Calumet & Hecla by the unusual amount of advanced work that is kept ahead. Levels are run and ground is blocked out far in advance of present needs, and this, together with the great extent and comparative uniformity of the ore chutes, invests the enterprise referred to with an element of stability and certainty that is usually wanting in mining enterprises.

It is difficult to suggest an adequate remedy for the evils mentioned. We cannot recommend retrograding to the small plants and slow ore-extraction of past generations; and yet we cannot pursue the present plan of rapid extraction, without soon exhausting the mine, and at the same time rendering worthless the enormous plant that is necessary to operate on such a scale. One obvious remedy is the consolidation of interests, and the consequent reduction of the expenses for mining and smelting plants. Another, and perhaps the most important of all, is the tendency toward reduction of cost in mining, smelting and selling the product of the mines. This enables us to work ores of a lower grade. And as the quantity in which ore occurs is usually in inverse proportion to its richness every reduction that is made in the cost of treatment opens up an enormous addition to the stock of material available for treatment. Still another safeguard will be the employment of experienced and responsible men, for both mining, building and metallurgical operations, and the charging off of a fair proportion of the cost of mine and plant every year. This will lessen the annual profits to a certain extent, though not nearly so much as might be expected, as it will have a powerful influence in reducing the costs of construction and in limiting them to what is absolutely necessary.

When mining enterprises are conducted upon this basis, they will become a favorite form of investment and no one who has carefully studied the advances that have been made in the sciences of mining and metallurgy during the past 20 years, can doubt that before a similar period of time has passed, ores will be profitably worked of a grade that now

FAILURES IN "BOOMED" TOWNS.—II.

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

(Continued from Page 208.)

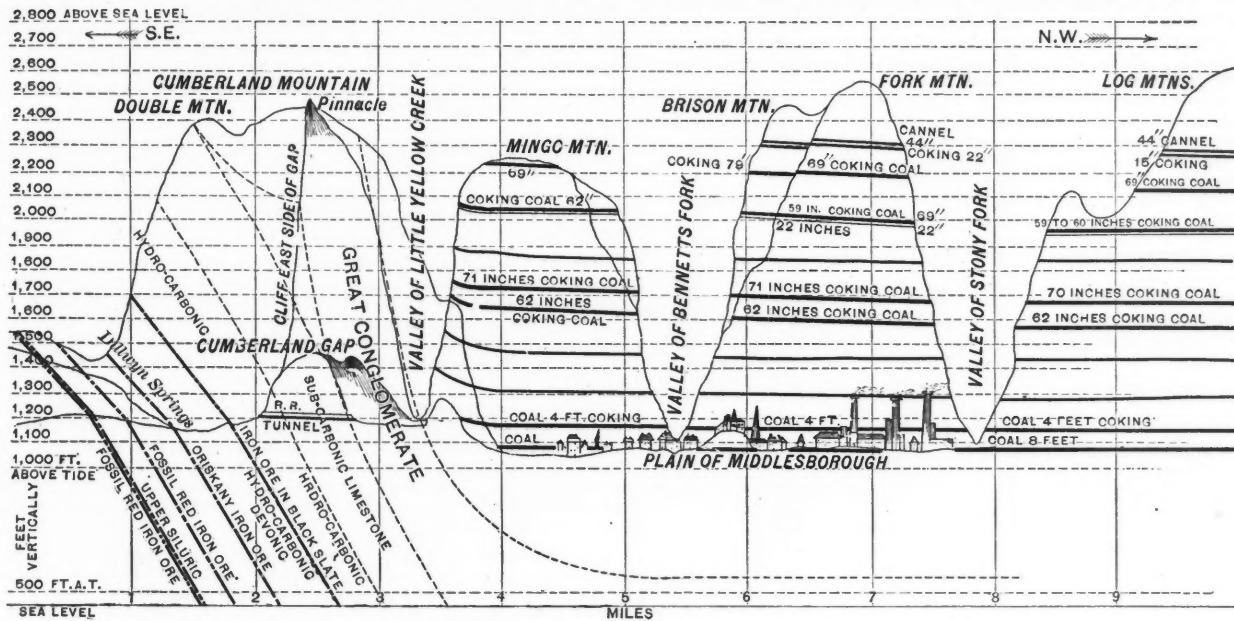
Upon its advantages as an iron manufacturing center Middlesborough has most of its importance. The geological cross section here given, which has already been published in the ENGINEERING AND MINING JOURNAL (February 5th, 1890), gives a good idea of the general formation, though due allowance must be made for the imagination of the geologist.

Considering the minerals we have first, the coal. There are, from the bed of Bennett's Fork branch to the top of Mingo Mt. eight distinct seams lying nearly horizontal, the lowest, some 25 ft. above the creek, is 70 in. thick with a parting of slate varying from 6 in. to 12 in., reducing actual coal to probably 60 in. on an average. The seams lying above this are said to be 24 in., 66 in., 42 in., 54 in., 48 in., 48 in. and 72 in. respectively in their order upward: the 54-in. seam is called the gas coal vein, and the following analysis is said to have been made from it: Water and volatile matter, 38.10%; fixed carbon, 59.50%; ash, 2.40%.

The following is a published analysis of the coke made from the lower seam and also analyses of Pocahontas coke for comparison.

	Middlesborough coke.	Pocahontas Coke.
Water and volatile matter...	1.30%	.901%
Volatile matter fixed carbon	91.896	92.248
Ash.....	6.70	6.286
Sulphur.....	.688	.565
Phosphorus.....	.018	not est.
	(E. K. Landis, chemist.)	(A. S. McCrath chemist.)

Other analyses show nearly similar results; the appearance of the coke bears out the analysis; it is hard, strong, has a good metallic ring, and looks well fitted to carry a heavy burden in the furnace. It is to be regretted that no analyses of the ash have been made, as the percentage of



CROSS-SECTION OF MIDDLESBOROUGH, KY.*

cannot be touched; and that just in proportion to the lower grade, and consequently greater quantity and regularity of the ores, mining enterprises will gain in certainty and stability. Even at present, where they are managed by experienced men and run with the same care and economy as a first rate railroad or factory, I am inclined to believe that they are more generally and certainly profitable than average manufacturing undertakings. And when a proper sinking fund is established, and they are surrounded with the other safeguards I have mentioned, they will doubtless rank among the favorite investments of the day.

DORCHESTER, Mass., Feb. 22, 1892.

EDW. D. PETERS, JR.

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

MINING CLAIMS—MILL SITE IMPROVEMENTS.

1. The erection and maintenance in good faith of dwelling houses for the occupancy of workmen employed for purposes in connection with a mill for the reduction of ores, is such a use and occupancy of the land as will justify the granting of a mill-site entry of the same.

2. The erection of such houses is clearly a substantial use and improvement of the land. They become a part of the realty and would pass by a conveyance of the land, and when such houses are erected for the accommodation of workmen employed in connection with the mill the land is used for milling purposes.—*In re Satisfaction Extension Mill Site (New Mexico)* [Rendered February 11th, 1892].

MINING CLAIM—PUBLICATION OF NOTICE.

1. The notice of application for mineral patent must be published in the newspaper issued nearest to the claim.

2. A statute providing for the service of notice by publication should be strictly observed in order to give jurisdiction.

3. A case cannot properly be referred to the Board of Equitable Adjudication for settlement where no legal notice has been given of the application for patent, as by such omission no opportunity has been given protestants to assert their rights, if they have any.—*Condon et al. v. Mammoth Mining Company* [Rendered February 5th, prom. 15th, 1892].

silica, lime and alumina in it have an important bearing on the quality of iron made.

The openings which have been made in the lower seam, which is the only one being mined at present, have been with the view of working on the room system; from the general character of the vein it seems as though the long wall, or a modified form of it in connection with coal cutting machines and some system of haulage other than mule power, would be more economical, and by allowing the roof to settle gradually less likely to disturb the upper measures which may be worked later on if found desirable. It is not likely that, with so much coal around, it will be necessary to open more than two seams on the same tract, and this only if the coal from one particular seam is found desirable for a special purpose. The coal from the lower seam, while coking well, serves as an excellent fuel for both domestic and boiler use; in the grate it cokes, and when broken leaves a fine bed of coals; an evaporative test gave, under favorable conditions, 10.3 lbs. of water from and at 212° by 1 lb. coal.

Miners receive 37½ c. per net ton for cutting. The roof being solid sandstone it will not be necessary to do much timbering, and owing to the convenient height of the seam but little dead work will be required. So far as can be seen the seam appears to be comparatively regular in thickness, the bottom undulating a little, but, so far as developments have gone, not enough to cause trouble.

Judging from present appearances it is likely that the cost delivered at the tippie, with a moderate output under ordinary conditions and with good management will not exceed 75c. per ton with the royalty of 10c. included. Lump coal is worth \$1.80 at the mines for the Knoxville trade, and about the same for domestic use. The coal coming from the mines will pass over a screen, lump being shipped and screenings used for coking. The average cost of the coke will probably be as follows: 1½ tons coal at 75c., \$1.31; coking, 40c.; loss, repairs, etc., 5c.; total, \$1.76.

The selling price is \$1.90 on cars at ovens, the Watts Syndicate contracting for three years supply, the minimum amount per day to be 300 tons. According to the terms of this contract, by the way, delivery was to have commenced December 1st, 1890.

The iron ore supply for Middlesborough cannot so readily be solved "with-

From the ENGINEERING AND MINING JOURNAL, vol. XLIX., p. 171.

in five miles of the town" as that of coal. The brown hematite ores are in scattered beds of uncertain size and while in the so called "Oriskany" belt these have some degree of regularity, yet they had not, in 1890, been sufficiently developed to justify the great expectations of the association or furnace people. Some six or eight test pits have been dug in this belt along the foot of Cumberland Mountain within a distance of five miles, but none of them have shown any large quantity of ore to be present. Some four miles below Cumberland Gap an entry was driven into the clay for perhaps 350 ft., then branching to the right and left, the former going about 100 ft. and the latter 15 ft. At the intersection a shaft has been sunk 20 ft. and a heading run forward from the bottom in a line with the main entry. Very little ore has been struck; some scattered pieces here and there, but in no place sufficient to justify mining operations. The other test openings made a better showing, but on the whole are discouraging.

The ore occurs mixed with chert in clay surrounding limestone bowlders, and in this respect is somewhat similar to the deposit at Ivanhoe, Va., though the character of the ore is different. While it is possible that some picked samples of the ore will yield as high as 56% iron, it is not probable that the average will be above 46%. To bring it to this it will be necessary to remove at least $\frac{3}{4}$ cu. yds. of "pay gravel" to get one ton of ore and this will have to be either hand-picked or washed. As the deposits are so uncertain in size it is doubtful whether it would pay to run a switch in from the railroad, and carting is expensive and slow. Considering all things it is not probable that this ore can be placed in Middlesborough for much, if any, less than \$2 per ton, and it will not be well to count upon it as a permanent source of supply in any quantity.

The red fossil hematite which is found in the Clinton formation from New York State to Alabama is fairly well developed in the neighborhood of Middlesborough and must form the main ore supply. Through Virginia this ore almost disappears, but near Big Stone Gap the vein begins to increase in size, and from that place to below Cumberland Gap varies from 2 ft. to 4 ft in thickness; a smaller vein accompanies this, running from 6 in. to 2 ft. in thickness, and at irregular intervals a third vein, still smaller, comes in. Owing to the irregular nature of the country, the ore is sometimes under heavy cover; at others with but little over it, and again entirely gone with the measures below it exposed. The Watts Syndicate has leased from the association a large tract of land containing ore and has commenced operations by both stripping and underground mining. The following three analyses are of ore from this seam taken from near Grabels Gap, 18 miles northeast of Middlesborough; the first two being picked samples from the outcrop and the last an attempt to secure an average.

	1	2	3
Iron.....	55.01%	52.02%	42.25%
Silica.....	12.17	14.60	22.23
Phosphorus.....	.138	.149	.548

The first two are above and the last below the average which would be produced in regular mining; other mines located on the same seam some 80 miles below, averaged, in shipments extending over two years:

	"Soft" ore.	"Hard" ore.
Iron.....	45.68%	31.36%
Alumina.....	8.38	Carbonate of lime..... 36.45
Silica.....	17.46	6.90
Phosphorus.....	.442	.521

From the appearance of the Middlesborough ore it does not seem probable that it will prove itself any better than this.

The term "soft" is applied to these ores when the carbonate of lime is not in sufficient quantity, in connection with any magnesia and alumina present, to flux the silica in the ore; "hard" when the lime is in excess. A notable characteristic of these Clinton ores is that when the seam is below the drainage level of the surrounding ground or protected by heavy cover, from the leaching action of water, the lime rapidly increases and iron diminishes; this is a difficulty which will be encountered in the underground operations and in the stripping work a heavy growth of forest timber and brush must be cleared away. Considering all things in reference to cost of ore, and basing them upon experience elsewhere it is not likely, even with the Rand drills and air compressors which they intended putting in and which will be of the utmost service in reducing the cost of mining, that the ore will cost, on an average, less than \$1.80 per ton delivered in Middlesborough, and it is possible that it will be as high as \$2 or more.

The "Red Hematite" ores referred to in the extract quoted, are distinct from the red fossil hematites and have not yet been found in paying quantities anywhere in the South; though specimens of it, and in a few places small veins rarely 6 in. thick, have been found.

Manganese ore and manganiferous brown hematite occur in small local deposits in the hills to the east, but no developments which have been made show sufficient ore to justify any extensive mining operations. The "Spathic" and "Argillaceous" ores are in too small quantities to be valuable, and the deposits of metallic paint have not been proved sufficiently pure to be commercially useful.

The zinc blende, calamine and galena were not examined, as they had not been sufficiently explored to warrant an opinion. Limestone is plentiful and in all varieties from almost pure carbonate of lime to dolomite.

The timber resources of the place are very good; some little walnut remains uncut on the hills, and fine white and red oak, chestnut and other hard woods are abundant. The facilities for getting timber into town to work up are not so good, and cannot be greatly improved owing to the rough nature of the country, but within reach of the belt railroad and its switches there is a supply that will last for some time.

Some fairly good fire brick have been made from the clays found in the coal measures; they appear to be suitable for coke ovens or such work and possibly the upper part of a blast furnace lining, but it is doubtful if they would stand the intense heat and fluxing action in the bosh and hearth.

A conservative estimate of the cost of making coke pig iron here based on the figures already given, is as follows: $\frac{2}{3}$ tons ore, at \$2, \$4.50; $\frac{1}{2}$ tons coke, at \$2, \$2.50; $\frac{1}{2}$ ton limestone, at 60c., 45c.; salaries, office expenses and labor, \$2; repairs, supplies, waste, etc., \$1; interest on plant and other items, 50c.; selling expenses, losses, etc., 50c.; total, \$11.45. To which add: Freight to Louisville, \$2; freight to Cincinnati, \$2; freight to Philadelphia, \$4; freight to New York, \$4.50; freight to Chicago, \$3.25.

It will be seen that the margin of profit is extremely small, and while these figures are taking all materials at a full valuation it is not likely that even the closest economy in working will make much of a reduction.

It is only natural that the projectors of Middlesborough should keep in the background, or gloss over, any disadvantages which the place might have; indeed it is not likely that many of the English stockholders know, or did know before the recent investigation which report says has been made into the affairs of the association, that there are any things in the place which were not advantages. Some of these stockholders who have visited the place are astonishingly ignorant of all matters pertaining to the successful management of a town or its mineral resources; they are guided in their views by the persons in charge of the enterprise, and have blind confidence in statements which they make. If, as report says, there is a change being made in the method and management it is merely what was prophesied some time ago by several well known engineers who visited the place, and may lead to the adoption of a plan which will insure success to the place.

Dr. Peters, the African Explorer, has discovered enormous saltpetre beds between Mount Kilima Njaro and the volcano Donjo Ngai. The whole great territory between Kilima Njaro and Donjo Ngai is said to be one great saltpetre bed.

Brazilian Phosphate Deposits.—Phosphate deposits were recently discovered on Rata Island, in the Fernando de Noronha Archipelago, northeast of Brazil. Iron states that a cargo of this phosphate, which had been received at St. Nazaire, contains, according to M. Andouard, 26% to 33% of phosphoric acid, 10% to 15% of sesquioxide of iron and 18% to 23% of alumina.

Utilization of Sawdust.—It is stated, says the *Engineer*, that a German firm has perfected a means of making a profitable disposition of sawdust. An acid is mixed with the sawdust and the whole mass molded into blocks or any other form, making an excellent material for building purposes. The blocks assume extreme hardness of surface and are practically non-combustible.

Copper in Sumatra.—It is announced, says *Iron*, that copper ore has been discovered in abundance between Solok and Siloengkang, Sumatra, in proximity to the Ombilien Railway. A number of specimens of the ore (malachite) have been sent to the Batavian Mineralogical Museum. No definite information as to the value of the deposits can yet be given, but a report is shortly to be issued by the government mining officials.

Cement for Metal.—A well known cement is prepared from zinc oxide and zinc chloride and some other material, such as iron slag, powdered glass, etc.; it may be caused to set more slowly by adding to the zinc chloride, when it is mixed with the other ingredients, some zinc sulphate and powdered limestone. The adhesive power of the cement (for cementing metals) may be increased by the addition of 2% of ferrous sulphate.

The Mineral Resources of Tunis.—At present, only five mineral concessions are being exploited in Tunis, namely, four lead mines and one iron mine; but researches have lately, it is understood, led to several applications being made for permission to preliminarily exploit various metalliferous deposits. Lead and zinc are the predominating minerals; but there are also veins of copper, silver, quicksilver and iron. Gold is found in the sands of several rivers.

Cork Pavement.—A new material for paving is now being introduced in London. It is composed of granulated cork and bitumen pressed into blocks, which are laid like bricks or wood paving. The special advantage of the material lies in its elasticity. In roadways it furnishes a splendid foothold for horses, and at the same time almost abolishes the noise which is such an unpleasant feature of city traffic. In Australia short pieces of such roadway have given good results.

Sunshine in England.—By the sunshine recording instrument at Bunnhillow, London, no sunshine was registered in either December, 1884, January, 1885, or December, 1890, says the *Engineer*. Greenwich only secures 25% of the total duration, as its mean monthly figure for the 10 years, while Kew Observatory, lying to windward of London, has 28%. Jersey is the only station in England recording in any month on the mean of the 10 years an average of even one-half of its possible amount of sunshine; 52% is the value for May and 55% for August. The highest figure for any other station is 48% for Geldeston in May. The east coast, as far up as Aberdeen, is decidedly sunny.

Relation of Copper and the Precious Metals to Certain Gases.—Dr. G. Neumann, in a recent communication to the Vienna Academy of Sciences (*Chemiker Zeitung*, Feb. 3, 1892) on the behavior of copper and the precious metals in the presence of some gases and vapors, showed that copper reduced with hydrogen on being heated in the carbonic acid current not only does not give off all the hydrogen, but also takes up carbon. Further, in the reduction of copper with aethylalcohol, methylalcohol or illuminating gas, carbon and hydrogen are retained. The absorbed carbon-hydrogen combination adheres so closely to the metal that they are not dissipated even at a temperature of 220°. Dr. Neumann also establishes the fact that silver, gold, platinum and palladium are oxidized in oxygen at about 450°.

Phosphide of Copper.—None of the combinations of copper and phosphorus hitherto noted is crystallized. In pursuing the study of a phosphide obtained by Sir Frederick Abel, M. Besson (*La Génie Civil*, February 6, 1892) has been able to prepare a new compound, and to obtain it in definite crystals. Taking up the phosphide of copper prepared by Sir Frederick Abel, the French savant shows that the composition varies according to the duration of heating in the phosphorus vapor. He caused the phosphorus vapor to act on the product, and at the end of several hours it began to iridate; then its surface became covered with branchlike figures; and, finally, fairly definite crystals were formed in the shape of hexagonal prisms. These crystals, which attain a length of from three to four millimetres, are of a steel grey color, very brilliant, hard and brittle. Their composition responds to the formula Cu^3P .

THE LENCUAUCHEZ ANNEALING FURNACE.*

By J. A. Lencuauchez.

Having built many annealing ovens, I think that the most important point of annealing is gas-heating with producer gas. With gas-heating it is always possible to have a good distribution of flame in the oven. The gas-heating system is also the most economical, not only in fuel, but in labor, and it makes a higher quality of products. This is easy to understand, for, independently of the equal distribution of flame, it is always possible with gas-heating to have a non-oxidizing flame and to prevent the introduction of cold air.

Annealing is generally done in cases made from cast iron or cast steel. These cases are variable in size. For annealing with red hematite they are like a pot. The diameter is seldom more than 2 ft., in order that the heat may penetrate into the middle. In the case of large work it is possible to use rectangular cases 1 ft. 6 in. to 2 ft. high. The heating and the cooling must be done slowly. These principles admitted, we may have two kinds of oven, depending upon whether the cooling is to be done in or outside the furnace. Figs. 1 and 2 refer to ovens of the second kind. These furnaces are tunnels 22 ft. to 26 ft. in length, and 4 ft. to 7 ft. in breadth, though they may be of much smaller dimensions, the size depending upon the production desired. In each furnace there are six or ten cases, and these cases can be used from 40 to 60 times if they are of good cast steel. In the newer designs of ovens the supporting chariot is covered with bricks, and forms the bottom of the annealing oven. The burners are placed in the middle of the furnace. Inside them gas and hot air are commingled, and, as the burners are like a grating, the flame is divided and conducted above and along the sides of the cases, and not direct upon them.

There should always be a reducing flame inside the oven, and I so arrange it that there shall always be more gas than air. This is very important as regards the quality of the annealed products, and brings about great durability of the cases. The flames escape from the furnace at both ends and near the doors in the bottom, and are then conducted into the regenerator under the oven, where the combustion is finished with

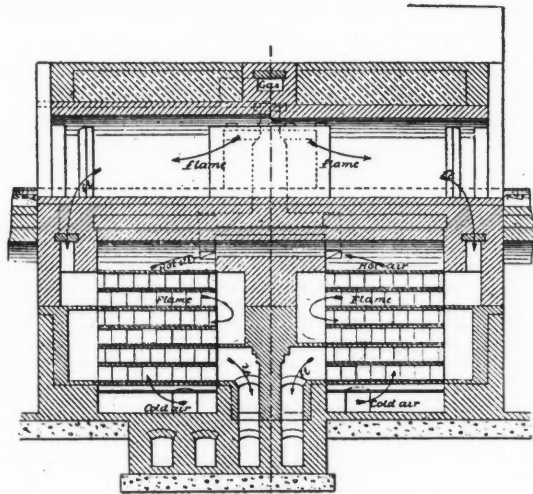


Fig. 1.—Transverse Sections through AB and CD.

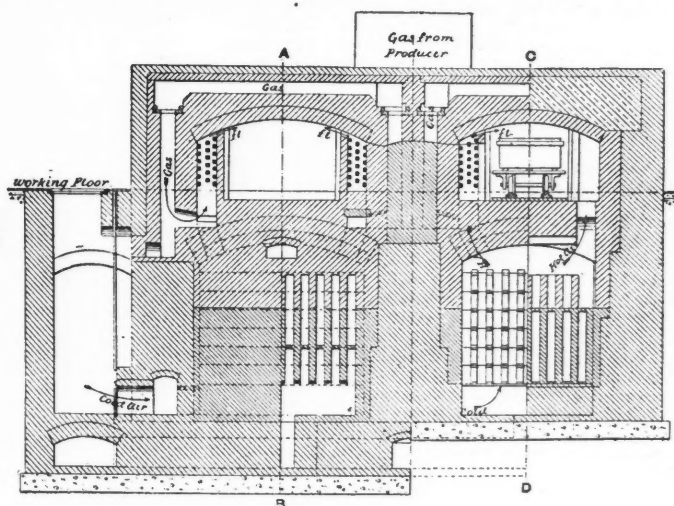


Fig. 2.—Longitudinal Section.

AN IMPROVED ANNEALING FURNACE.

additional air. This regenerator is made of perforated bricks, which are built one over the other and form horizontal flues. The direction of the air is vertical inside the perforated bricks, while that of the flame is horizontal outside the bricks and goes in a zigzag course to the general flue at the bottom of the regenerator.

The saving of fuel in comparison with ordinary furnaces is 40% to 50%, and the quality of the products is of a higher class. The working is very simple, and is done with two or three chariots. At both ends of the oven, and at some distance from the doors, there are two windlasses for moving the chariots. While one chariot with its charge is in the furnace, the other outside is being made ready to take the place of the former. This to-and-fro handling is performed by means of one of the windlasses, one chariot being introduced in the oven while the other with the annealed charge is being drawn out.

If the cooling is to be done slowly inside the oven, only one regenerator is required for two furnaces. With a reversing gear, gas and hot air are conducted into the oven during heating, while the oven during cooling remains closed. This kind of annealing with a double furnace is certainly the best, and is giving excellent results. In the tinplate works at Geugnon a furnace with two compartments anneals 19.5 tons per day, with a consumption of 2,150 kilos. of Blanzey small coal, or 105 kilos. (2 cwt. 8 lbs.) per ton. The longest annealing lasts 24 hours, 12 for the heating and 12 for the cooling.

These ovens can be used, with small modifications, for any kind of annealing work—cast iron, cast steel, iron, copper, and brass plate or wire or plates for tinning.

Ovens of this kind have been in use for six or seven years in France and are giving very satisfactory results in different industries at St. Denis, Serfontaine, Geugnon, Anzin and Castel Sarasin.

A new tent is about to be introduced into the German army. It is divisible into two portions, each of which can be used as an overcoat by the soldiers in case of rain.

*We are indebted to *Industries* for the accompanying illustrations.

THE LIMESTONE AND GOLD STRATA OF DEEP CREEK, UTAH.*

By William P. Blake, M. E.

The Deep Creek region, so called, lies along the western border of Utah territory, and nearly southwest of the Great Salt Lake. It borders upon the State of Nevada, and has lately been brought into prominence by reason of the development of deposits of argentiferous lead ores and of auriferous copper ores. The prevailing formations are granite and limestone. The limestone is largely developed, and forms ranges of hills and mountains of considerable extent, trending generally in a northerly and southerly direction, parallel with the ranges of Tintic and of the southern end of Salt Lake. The principal range, known as the Ibapah, forms the eastern side of Deep Creek valley. Ibapah Mountain, the highest peak of the range, is said to be the highest mountain in Utah, higher even than any of the grand mountain masses of the Wahsatch, not excepting Mt. Nebo. Ibapah is flanked on the north by massive strata of limestone, which in some places, notably at Gold Hill, are much uplifted and metamorphosed apparently by intrusions of granitic and porphyritic dykes, the alteration consisting in loss of color (the ordinary grayish-blue color being changed to white), a coarse crystallization, and the formation of a variety of silicates, such as garnet, tremolite and tourmaline, especially near the planes of contact with the dykes. There is also more or less mineralization in places, either in the form of vein-like beds or in isolated patches and bunches at a considerable distance from any crystalline rock—but not outside of the crystalline and whitened portions of the limestone. This last observation applies particularly to some of the copper ores found in the midst of the limestone existing primarily as the variegated sulphuret—erubescite. These ore nodules have decomposed and have formed green carbonate of copper, which stains the rock for a considerable distance around and beyond the original nodule, or bunch, of sulphide. In such places free gold of high grade may be found by crushing and washing the rock. This noble metal occurs also independently of any cupriferous mineralization in the midst of masses of colorless tremolite, in coarse grains and strings in very much the same

form in which it is found in other regions ramifying through quartz. This is an unusual and unique association of gold. It has been found, but rarely, in close association with greenish black hornblende in veins composed partly of quartz and partly of dolomite, but never before, to my knowledge, in white tremolite. This tremolite carries also some small disseminated crystals of iron pyrites.

The limestone in which the gold occurs appears to be the lower Carboniferous, or mountain limestone, as shown by an abundance of fossils, chiefly of the genus *Productus*, found a short distance east of Gold Hill.

From the fact that coarse gold in placer deposits has been found at Osceola and its vicinity, nearly south of the Ibapah Mountain, it would appear that there is a gold region extending north and south near the Nevada and Utah line, and that the placers were formed during the period of great precipitation or rainfall which preceded the present era of gradual desiccation. At the place where gold is now taken from heavy deposits of boulders and gravel the flow of water is wholly inadequate to the formation of such deposits. Probably the deposits were formed during the great glacial epoch of which there are such magnificent records in the Sierra Nevada and the Wahsatch, as well as in the ancient beaches of Lake Bonneville. A good supply of water, even for ordinary purposes, is now one of the greatest needs of the Deep Creek region.

The Russian Quicksilver Mines.—In addition to the quicksilver mines in operation near Bakhmont, in European Russia, which produce at the present time 20,000 poods of mercury annually, deposits of mercury have been discovered in the province of Daghestan, in Caucasia, and the mining administration has every reason to believe that private enterprises will be established which will make undertakings of this kind very profitable, says the *Chemist and Druggist*. The Ministry of Domains has decided to tax Russian mercury, as is done with all other Russian metals. It is proposed to establish a tax of 50 copecks per pood of pure mercury.

* From the *American Geologist*, January, 1892.

THE GROSH BROTHERS.—A MYSTERIOUS PAIR.

Written for The Engineering and Mining Journal by Dan De Quille.

Among the miners working in the Gold Cañon placer mines the first to suspect the existence of silver in the "Washoe" region were undoubtedly the two brothers, Hosea B. and Ethan Allen Grosh. These young men arrived at the diggings in 1852, and worked on Gold Cañon and in Nigger Ravine, the latter a tributary of the cañon named. They were sons of Rev. A. B. Grosh, a Universalist clergyman, who was editor of a Universalist paper published at Utica, N. Y. They were fairly successful in gold washing—the placers at that time paying from half an ounce to an ounce a day to the man—and soon erected a small stone cabin and settled down as miners.

The brothers being very quiet and reticent, they soon began to be looked upon as a mysterious pair. The majority of the gold diggers being rude and unlettered men the brothers did not find them congenial associates; therefore did not seek their companionship. Regarding themselves as being the best of good fellows, the diggers could see no reason for the brothers holding themselves aloof from their society except that they were secretly engaged in working out some abstruse mineralogical problem. The report that the young men had "books in their cabin" strengthened this belief, and it was soon said that the brothers possessed a large stock of chemicals and all kinds of assaying apparatus. The miners seem never to have in the least resented the exclusiveness of the young men, but to have respected them as a pair of dreamers of the alchemist order for whom the sort of hermit life they led was quite proper.

The cabin of the Grosh brothers stood at the base of a large mountain spur known as Grizzly hill, just at the south end of the present town of Silver City. Their cabin was not on Gold Cañon, but a few rods above on a tributary called American Ravine. The brothers were well educated and appear to have had considerable knowledge of geology and mineralogy. They probably had a few books on these subjects, but they could have had nothing more in the way of instruments for assaying and testing ores than a blowpipe and gold scales, and probably did not have even those aids. I am of the opinion that the only apparatus for testing ores they had was that made by themselves on the ground, when they discovered an ore which they believed to contain silver.

At first the brothers appear to have given their undivided attention to mining for gold in the gravel deposits, but about 1853-54 they began to explore the surrounding country and prospect the many quartz veins cropping out in every direction among the hills encircling their cabin. They most likely began this work in the hope of finding some rich vein of gold bearing quartz—the source of the placer gold found in the cañon—and while so employed probably found one or more veins containing argentiferous galena. Testing this in a rude way they were able to extract some buttons of silver—the first silver ever smelted and refined in the great silver fields lying between the Rocky Mountains and the Sierra Nevada Range. They told a few persons that they had found silver ore in the country, but I have never found a man among the old Gold Cañon miners to whom they showed any samples of it. Nevertheless I am quite sure, from evidences found by myself, mention of which will presently be made, that they did find an ore containing silver and that they extracted from it some buttons of the metal.

It has been claimed by some writers that the Grosh brothers were the first discoverers of silver in what is now known as the Comstock Lode, but there is no evidence that they ever obtained a particle of silver from that vein, or that they ever prospected it for silver. Their field of operations was to the southward, five miles away from the place where silver was first found on the Comstock. Doubtless, in coming up Six-Mile Cañon from Dayton, they frequently saw the masses of croppings of the Comstock Lode on the side of Mount Davidson, and may have even visited and examined some of the upheavals, but silver nowhere shows in the croppings, nor can much gold be found in those parts of the vein which project above the surface. The quartz composing the croppings of the lode is almost everywhere rather coarse and uninviting, being filled with small angular fragments of country rock. At Gold Hill, where the surface of the vein was decomposed in one place, gold was found at the "grass roots," and the ground there was at first mistaken for a placer deposit and located as such by the discoverers. In that part of the vein the black sulphuret of silver was not reached until the water-level had been attained—150 ft. to 250 ft. below the surface. The ores of the Gold Hill mines were at first worked for gold. Although traces of silver may be found in places in the croppings of the Comstock Lode, yet there is nothing in their appearance that would have induced anyone to test them for that metal at the time the Grosh boys were alive—that is previous to the great discovery made on the vein in 1859. There is in the croppings no indication of the immense wealth that has been found at some depth under ground.

Some writers have given Comstock the credit of being the first discoverer of silver in the lode that bears his name; others have credited "Old Virginia" with the discovery, and some Joe Kirby and his partners, while one writer says that when the first Americans arrived in the country they found a party of Mexicans at work upon the croppings of the lode. The truth is that Peter O'Reily and Patrick McLaughlin were the first who ever turned up to the light of day the rich silver ore of the Comstock. They happened to hit upon a place where the ore came near the surface, and the only such place on the whole line of the lode.

The fate of the Grosh boys was peculiarly sad. Both lost their lives by accidents that entailed great suffering. In the spring of 1857, while engaged in placer mining on Nigger Ravine, just east of the present town of Silver City, Hosea stuck the point of a pick into his foot, inflicting a severe wound, which brought on lockjaw and resulted in his death in a few days. He was buried a little below Silver City, on the hillside, a few rods south of Gold Cañon.

Comstock, always full of sympathy for the suffering, had the young man carried to his cabin, after the accident, and cared for him as tenderly as a woman could have done until death ended his sufferings.

After the death of Hosea, Allen is said to have so mourned his loss as to have fallen into a sort of decline—"seemed to be pining away," as the miners said. He found his cabin so lonely that at last, in November of that year, he determined to cross the Sierras and winter in Volcano, his

old California camp. This was a dangerous trip to undertake so late in the season. He was caught in a heavy snowstorm on the mountains, and had both his feet so frozen that amputation was necessary. He died from the shock of the operation.

It was said that the Grosh brothers had formed a company in Volcano to develop the silver mine they had discovered, but with their death the secret of its whereabouts was lost. The miners of Gold Cañon knew nothing of their having located a quartz vein of any kind. Had they known of any location made by the brothers, there would have been a rush for it as soon as the discovery of silver on the side of Mount Davidson was known. Although there were those in the placer mines who had heard the brothers say they had found silver in the country, and some who knew that the young men had rigged up some kind of apparatus for testing ores, yet they had so little faith in the experiments the pair were making that what they had said and done had been almost forgotten when, two years later, O'Reily and McLaughlin made their great discovery. Then all the old timers remembered what the Grosh brothers had said and regretted that they had not given more attention to their talk about silver.

As regarded the "library" and assaying apparatus the young men were reported to have possessed, it was said by some that after Allen lost his life in the mountains Comstock carried away everything left in the Grosh cabin. When Comstock denied having found either books or assaying tools, it was said that, before leaving, Allen must have cached all such things somewhere about Grizzly Hill. In 1860, men who had been told this story actually searched old piles of stones, tunnels and prospect holes in the hope of finding the buried books and tools, their idea being that books would keep as well in the ground as potatoes or turnips.

In the winter of 1861-62 a heavy rainfall occurred, resulting in a flood that destroyed several buildings in the south end of Silver City, and swept the cañons of the accumulated debris of many years. I had a cabin near the site of that of the Grosh brothers, and going down to American Ravine (about three rods from my door) one morning after the torrent had swept by, I found laid bare by the washing away of a foot or two of sand and loam two little brick structures which I saw at a glance had been intended for use in smelting ore. Knowing they could have been the work of no one but the Grosh brothers, I examined the little structures and all in and about them very carefully.

They stood on a little flat beneath the shelter of a clump of willows about two feet above the regular channel of the ravine. They were constructed of ordinary building brick and were about two feet in length, a foot in depth, and eighteen inches in width. One had been intended for use as a smelting, and the other as a muffle or cupel furnace. Both were open at the top—were indeed nothing more than little walls of brick inclosing a small space of ground provided with a floor of clay—were merely little boxes of brick in which to confine the charcoal used and the heat generated.

In one of the little furnaces I found the bottom of a stone jug which had evidently been pressed into service and made to do duty as a crucible; in the other was a slab of burned clay in the shape of a tile, in which were several round holes about the size of an ordinary cupel. The tile rested upon two pieces of brick, and undoubtedly had been used to hold cupels, fragments of which were discovered in the bottom of the rude muffle furnace. These cupels had no doubt been made on the spot by the young men, and were composed of bone ash and a small percentage of clay. Some of the pieces found showed that they had been used in the cupellation of an ore containing lead, as they bore the orange stain which is imparted to a cupel by the absorption of litharge. Indeed, a search brought to light some lumps of argentiferous galena lying where it had been broken up on a flat stone a few feet from the little furnaces. This ore I at once recognized as being from what was called the "Red Lead," a vein of argentiferous galena situated about half a mile west of the cabin of the Grosh brothers, and which carried from \$40 to \$60 a ton in silver and about 50% lead. The ore in this vein came to the surface, but proved to be nothing more than a pocket when a shaft was sunk upon it. I am quite confident that it was from this vein that the Grosh brothers obtained the silver of which they spoke. Alongside the furnaces was found a small tube of tin about 2 ft. in length, which had probably formed the nozzle of a small canvas bellows.

The Surveyor-General of Nevada, in his report for 1865, speaking of the Silver City mining district, says: "It is remarkable as the locality of the first operations for the discovery of silver in the State. In 1852 H. B. and E. A. Grosh, or Grosh, educated metallurgists, came to the then Territory, and the same or the following year engaged in placer mining in Gold Cañon, near the site of Silver City, and continued there until 1857, when, so far as I can learn, they first discovered silver ore, which was found in a quartz vein (probably the one now owned by the Kossuth Gold and Silver Mining Company) on which the Grosh brothers had a location. Shortly after the discovery one of the brothers accidentally wounded himself with a pick, from the effects of which he soon died, and the other brother went to California, where he died early in 1858, which probably prevented the valuable nature of their discovery from becoming known. In the meantime placer mining was carried on to a considerable extent in various localities, principally in Gold Cañon."

The Kossuth mine here mentioned is on a large vein of quartz that crops out on Grizzly Hill. It shows no silver in the croppings and only small assays of gold are obtainable. The Kossuth Company collected \$430,000 in assessments and paid one dividend of six cents a share, aggregating \$10,800, when work was discontinued. There was nothing in or about the croppings that would have attracted the attention of a man in search of silver at the early day when the Grosh brothers were prospecting in the district.

A few rods west of the Kossuth croppings, in a sag on the side of Grizzly Hill, caused by an ancient slide, was an old shaft said to have been sunk by the Grosh boys. This probably gave rise to the story of their having discovered silver in the Kossuth. I was one of the locators (in 1860) of a mining claim that covered this old shaft. Therefore we called our property the "Lost Shaft." As the shaft appeared to have been sunk to prospect a quartz vein that cropped out on the hill above, we set to work to clean it out. The shaft appeared to be about 25 ft. in depth, but much surface dirt had caved into it.

A windlass was set up and men put to work at cleaning out the shaft. They had been at work only a few hours when one of them came up town

and asked me to come out to the shaft at once, as they had "struck a dead thing" in it. This news being imparted to me in front of the express office, where was congregated a crowd of miners and idlers, several persons pricked up their ears and "took in" what was said. I was but a few rods on my way when I saw a crowd following me. Like wildfire the news had spread that I had made a "big find" at the "Lost Shaft." Visions of immense wealth danced before my eyes and the vapors rising from my supposed bonanza entered my head and blew it up as though it had been a bladder. Looking back upon the crowd streaming after me I was pleased—it appeared that I had already acquired quite an imposing tail, though composed (as it appeared to me in my inflated state) very largely of the "vulgar herd."

Upon our arrival at the shaft my man pointed out to me a skeleton that had just been hoisted out of the shaft. Before me was the "dead thing" of which I had been told. There was a general laugh at my expense and by the time it had subsided my head had shrunk to its normal dimensions. The skeleton was that of a woman, as was shown by the calico dress, shoes and stockings and long hair. The body was wrapped in some pieces of patchwork quilt and a rabbit skin robe of Indian make. Noosed about the body was an inch rope over 30 ft. in length. This was thought to smack of murder. As the hair was of a reddish hue (bleached by the alkali in the soil), the body was thought to be that of a white woman. A doctor who examined the skull said it was that of a Spanish woman—"no Indian."

Then some of the old settlers recollected that a few years before there had been a Spanish woman on the cañon who had suddenly and mysteriously disappeared. At the time she was living with a miner, who was a rather tough customer. To those who heard the story it seemed that a mystery of some years' standing had just been cleared up. "Murder will out!" cried all hands. Next the thoughts of all turned to the supposed murderer, who

THE DISCOVERY OF SILVER IN NEVADA, THE WORK OF THE GROSH BROTHERS.

Mrs. Emma M. Jones, a sister of the ill-fated Grosh brothers, furnishes us with some further details of their lives. We are indebted to Mrs. Jones also for the portraits of her brothers accompanying this article, which is reproduced from a daguerreotype. E. Allen Grosh, the elder brother, was born in Marietta, Pa., in 1824, and Hosea B. Grosh in the same place in 1826. They were the sons of the Rev. A. B. Grosh, a Universalist clergyman. Both the young men received a good education and were well informed on general subjects and were of industrious and temperate habits. Their boyhood was spent in Utica, N. Y., but at the outbreak of the California gold excitement in 1849 they were living in Reading Pa. An organization of eighteen men was formed in that place called "The California Association of Reading," which they joined, Allen becoming the secretary of the association. They left Reading for California in February, 1849. The following extracts from a letter written by their father to Mrs. Dr. C. B. Winslow, of Washington, D. C., on July 8th, 1879, and printed in the *Lyon County Times*, of Silver City, Nev., August 27th, 1879, gives the subsequent details of their lives:

"E. Allen and Hosea B. Grosh went from Reading, Pa., in a company in 1849, and reached California, via Tampico and Mazatlan. They soon engaged in gold mining, most of the time at or near Mud Springs (now El Dorado), El Dorado County, with varying, but never very prosperous, fortunes. They visited Carson Valley in 1851, but soon returned to California. In 1853, however, they made it a longer visit, and pretty thoroughly prospected portions of what they called 'Carson Valley,' 'Gold Cañon,' 'Lake Valley,' and 'Washoe Valley,' and many of the adjoining mountains.

"After their return to California with specimens for fuller examination,



HOSEA B. GROSH.

ETHAN ALLEN GROSH.

was still in the camp, when the cry of "Hang him!" was raised. Luckily men were found who knew the body to be that of a lame old Piute squaw who had died on the cañon a few years before. There were men who had seen the Indians packing the body up to the old shaft.

Nothing was found in the old shaft in the way of ore. It was cleaned out to a depth of 40 ft., when men could no longer be found who would work in it. Three or four different crews of miners tried the shaft, but all gave it up. All complained that stones were constantly "jumping out of its sides" without the slightest cause or provocation. About this time, also, we discovered that the "Haunted Shaft," as it was now called, was sunk in 1851 by a party of miners who came up from the mouth of Gold Cañon. These men had mined about Placerville, and knowing that very rich diggings had been found in the sinks of such slides over in California, they expected to find in this one the source of all the gold strewn down along the cañon, whereas they did not find more than the "color" of gold.

At the time of the great excitement over the "big bonanza" in 1874-75 some of the relatives* of the Grosh brothers came out here from the East for the purpose of trying to establish a claim to some part of the Comstock lode, but they could find no evidence that the boys had ever done any work on or taken out silver from any part of the vein. At that time there were a considerable number of persons here who had known the two brothers (and several still remain who knew them), but they were unable to show where the boys obtained the silver they spoke of finding. All these people cherish the kindest feelings toward the unfortunate young men and regret that they did not live to share in the silver excitement of 1859, feeling sure that their knowledge of metals would have made them millionaires.

* Mrs. Emma M. Jones states that she is positive that no member of the family went or was sent to Nevada for any such purpose; nor does she know of any relative who went there.—ED. ENG. AND MIN. JOURNAL.

they wrote many letters giving details of their discoveries and of the information they were gradually acquiring respecting modes of testing their value. One stated that they found what they believed to be 'carbonate of silver, in Gold Cañon'—a 'dark gray' mass, 'tarnished, probably, by the sulphuric acid in the water. It resembles thin sheet lead, broken very fine, and lead the miners suppose it to be. The ore we found at the forks of the cañon—a large quartz vein—at least boulders from a vein close by here shows itself. . . . Other ore of silver we think we have found in the cañon, and a rock called *black rock*, very abundant, we think contains silver.' "These and other discoveries of this period led to many conversations with 'Old Frank,' an experienced Mexican miner, and to numerous experiments in assaying, as their limited means allowed, preparatory to a return to Carson Valley. They also organized a large company of kindred and friends in the middle Atlantic States, called the 'Utah Enterprise Mining Company,' of which they were part, and for which they were agents—which was to enable them to hold and work their various and numerous discoveries.

"But lack of means delayed their return to Carson Valley until May, 1857, when they obtained an outfit by organizing the 'Frank Mining Company'—named after 'Old Frank'—forenamed, constituted of themselves and a few wealthier friends who advanced the money. They soon rediscovered their former discoveries, and what they called 'our monster vein,' they located in the name of the Frank Company, and other veins in the name of the Utah Enterprise Company, and located in their own name what they termed 'a smaller but richer vein'—a much more promising vein, because more easily worked. Both these are said to be at or near 'the forks of the cañon.' They also mention 'suits of vein crossing the cañon at two other points,' and 'a mammoth vein of copper—copper pyrites—25 or 30 miles north of the cañon, containing considerable silver,' and resembling copper then about being mined for its silver, some distance from theirs.

"They found great difficulties in making reliable assays, in the nature of ores, being 'not, as we had supposed, magnetic oxide of iron, but the magnetic sulphuret of iron,' and other mixtures (antimony, etc.), adding difficulties in their toilsome and tedious labor, with deficient materials and imperfect apparatus. But all their assays showed the blackish, purple and violet rock to be rich in silver. The greatest difficulty, one they could not surmount except after much time and labor, was their poverty. To procure food they must use nearly every hour not absolutely needed for rest in gold digging and washing, leaving only a few spare hours for roasting and smelting.

"While engaged in digging earth on Gold Hill* for washing, Hosea struck his pick into the hollow of his foot. This was on August 19th, and mortification set in and caused his death on September 2d. He was buried respectfully by his fellow miners, and his remains have since been removed to a cemetery at Silver City and a memorial stone has been placed over them.

"Allen, as early as he could, on November 15th, in company with his friend, Mr. Bucke (now Dr. R. M. Bucke, Superintendent of the Dominion Insane Asylum, London, Canada), started for California. They were hindered by the loss of their mule and his recovery, and caught in the great snow storm of that year while in the Divide of the Sierra Nevada, and compelled to kill their mule, and throw away their specimens and other baggage, and continue their journey on foot through the deep and trackless snow. Their powder and matches got wet, and the mule-meat being consumed, they were four days and nights without fire or food, sleeping in their blankets under snow. They reached a Mexican miners' camp, legs frozen to above the knees, and thence were taken on sleds to Last Chance by the miners of the latter place, where Mr. Bucke had one leg and foot and part of the other foot amputated, and recovered. But Allen, after lingering most of the time unconscious, died December 19th, and was tenderly buried. Mr. Bucke has since marked the grave of his fellow-sufferer with a suitable memorial stone.

"A writer from Virginia City, in the New York Herald of December 30th, 1878, in giving a description of the Comstock lode and other mines, gives an account of my sons, their discoveries and deaths, which is generally correct, and says: 'From association with the two brothers Grosh, previous to their unfortunate deaths, Comstock, in some way or other, at their melancholy ending, came into possession of what property they left.' Dr. Bucke, who knew all parties well, says there was no intimacy between Comstock and my sons, nor was there any likelihood of their being any confidence reposed in the former by the latter, so widely different were they in character, disposition and habits. And if reports may be relied on, Comstock himself told so many differing stories in accounting for his possession and sale of the lode that it came to be believed that he took possession of books, maps and other papers which Allen had boxed up for safe keeping, and thus learned of the existence of the mines they had discovered and claimed them—sometimes as his own discovery, sometimes as having been left in his charge, for which he was to receive one-third or one-fourth, sometimes as their partner and sometimes as being on the spot and therefore nearer to them than any distant heirs, having the best right—that of possession!"

OFFICIAL REPORTS.

Horn Silver Mining Company, of Utah.

According to the annual report of Hon. P. T. Farnsworth, manager of this company, which has just been issued, the mine produced in 1891, 24,547 tons of ore, which came from all levels from the first down nearly to the 10th. The cost of ore extraction was \$66,134 or \$2,694 per ton; dead work and surface labor, \$29,653.80 (dead work, \$0.361 per ton and surface labor, \$0.847); supplies, \$34,209.20, or \$1.397 per ton. Each ton of ore cost, therefore, \$5,299, while the average value of the ore was \$14.90. The dead work done was as follows: Winzes, 142 lineal feet; cross-cuts, 386 ft.; drifts, 771 ft.; raises, 66 ft.; shaft, 200 ft.; old shaft retimbered between 1st and 3d levels, 80 ft.

Referring to developments in the mine the manager says:

"During the months of September, October and November little more than sufficient ore was sold than required to meet our expenses, not being able to find a market for our product. We could, however, have found a market for a large amount of ore at Pueblo, but we were cut off from this market by a prohibitory rate being placed upon the ore by the railway company, owing to some difficulty existing between the Union Pacific Railway Company and the smelting companies at that point. This embargo was raised about December 1st, and we were enabled to deliver to one firm over 3,000 tons of ore.

"The ore reserve in the mine is considerably in excess of that shown 12 months since, and the developments to the north on the 7th level are very encouraging. From 200 ft. to 400 ft. to the north, several seams of good ore have been cut, which vary from 6 in. to 2 ft. in thickness. This ground will be thoroughly prospected as soon as connection is made with the north shaft, which will require about 90 days. It is the intention to drift north on the 9th and 12th levels in the near future."

There was on hand January 1st, 1891, 1,212 tons of ore, making, with the ore extracted during the year, a total of 25,760 tons, valued at \$360,207.10, all of which was shipped.

The financial statement of the secretary and treasury was as follows: Cash balance from last annual report, \$269,787.17. Receipts—Ore sales, \$360,207.10; sales of ore from old dump and cave, \$2,530.58; receipts from store at Frisco, surplus fund, \$9,583.21; interest account, \$9,160.05; from F. Honkamp, Chicago, part payment of purchase money for refinery, \$5,000; house rents and merchandise sales, \$605.02; transfer fees, \$20.75; total, \$656,893.88. Payments—Labor, supplies, timbering, dead work and other expenses, \$157,795.51; salaries, Frisco and Salt Lake City, \$10,321.95; Chicago refinery, annual taxes, \$542.87; dividends Nos. 21, 22, 23, and 24, \$200,000; New York office, \$12,929.27; cash on hand, \$275,304.28; total, \$656,893.88. The assets of the company in addition to the mine were as follows: Outstanding amounts due the company, \$523,150.55; cash on hand, \$275,304.28; bills receivable (notes secured by real estate), \$89,000; estimated value of stock on hand at mine and store, \$37,560.05; works and plant at Francklyn, cost, \$179,065.64; hoisting works at mine, cost, \$52,134.12; real estate at Frisco, cost, \$34,775.54; total, \$1,190,970.18.

* Allen's letter says "From a small ravine to the right fork of the main cañon."

Consolidation Coal Company, of Maryland.

The president and directors of this company have submitted the following report of its business for the year ending December 31st, 1891:

The gross receipts from mines, railroads, rents, etc. (including value of stock of coal on hand), were \$2,581,338.20; total expenses of every kind (exclusive of interest), including 341 tons of heavy steel rails and all extraordinary outlays, \$2,196,952.31; net receipts, \$384,385.89; interest paid on funded debt for 1891, \$122,729.59; leaving balance to the credit of profit and loss on Dec. 31st, 1891, from the business of the year 1891, after the payment of interest on bonded debt and all expenses, of \$261,656.30. The balance to the credit of profit and loss on Dec. 31st, 1890, was \$80,436.51, adding to which the balance on Dec. 31st, 1891, the total balance to credit of profit and loss, Dec. 31st, 1891, was \$342,092.81. From this is to be deducted the dividend for the year 1891, payable Feb. 1st, 1892, \$205,000, and the amount carried to the credit of Royalty Fund being for royalty on the output of 1891, as per Royalty Fund, \$45,586.07, leaving a balance to the credit of profit and loss, \$91,506.74.

The amount to the credit of the Royalty Fund December 31st, 1890, was \$366,146.10; interest upon investments in 1891, \$21,189.61; Royalty upon the output of 1891, taken from the earnings, \$45,586.07; balance to the credit of Royalty Fund December 31st, 1891, \$432,921.78. This Royalty Fund is invested in interest bearing securities, and it is proposed to maintain and add to it hereafter, as a representative of the value of the coal which will be mined in the future from the company's property. The company also holds as a cash asset \$100,000 of mortgage bonds of the Cumberland & Pennsylvania Railroad, as mentioned in previous annual reports.

The total funded debt, secured by the several mortgages on the coal lands and railroad property of the company was, on January 1st, 1891, \$2,184,500; reduced during 1891 by the purchase and cancelling of the bonds of the Cumberland & Pennsylvania Railroad Company, \$64,500; total funded debt January 1st, 1892, \$2,120,000.

There were mined and delivered from the Consolidation Coal Company's mines in 1890, 956,031 tons of coal; in 1891, 910,977 tons; decrease, 45,054 tons. The total transportation of coal on all the company's railroads in 1890 was 2,286,885 tons; in 1891, 2,390,929 tons; increase, 104,044 tons.

The extensions and improvements in the mining department, referred to in previous reports, have been successfully continued. They are accomplishing fully the economies and enlarged facilities anticipated therefrom. The substitution of steam for horse and man power is being continued, wherever practicable, with very satisfactory results. The mines of the company are capable of a daily output of 4,500 tons.

THE PRODUCTION OF TIN AND TIN PLATE IN 1891.

From the annual metal circular of W. T. Sargent & Sons, in the *Journal of the Society of Chemical Industry*, of Jan. 30th, 1892, we gather the following statistics relating to the production and consumption of tin and tin plate. No figures have yet been received from the English tin mines, but it is admitted that there was no change from 1890 worth consideration. Estimating the production of these mines to have been the same as in 1890, the output of the tin mines of the world, with the exception of Bolivia, was 57,551 tons, as shown by the following table:

PRODUCTION OF TIN DURING THE PAST THREE YEARS.

Source.	1891. Tons.	1890. Tons.	1889. Tons.
English production.....	9,000	9,000	9,000
Straits shipments to Europe and America.....	31,457	27,470	28,295
Australian shipments to Europe and America.....	5,991	6,415	6,800
Banca sales in Holland.....	5,350	5,317	4,114
Billiton sales in Java and Holland.....	5,753	5,232	4,857
Total.....	57,551	53,434	53,066

The Bolivian mines are omitted from these returns because accurate figures are unobtainable; but although the quantity from this source is small by comparison it seems to be increasing. The Banca mines are being worked more vigorously and an increased supply of 700 to 1,000 tons will be sold in Holland this year.

The statistics of the consumption and stocks of tin are given in the following table:

	1891. Tons.	1890. Tons.	1889. Tons.
Stock in London and afloat Dec. 31.....	6,314	5,465	6,521
Stock in Holland and afloat Dec. 31.....	5,920	5,630	7,872
Stock in America and afloat Dec. 31.....	3,528	2,925	2,670
Total visible supply, Dec. 31.....	15,762	14,020	17,063
Total consumption.....	55,745	54,087	54,392
American consumption.....	15,457	16,000	15,000

TIN PLATES.

The reports of tin plates from the United Kingdom during the past three years is shown in the following table:

	1891. Tons.	1890. Tons.	1889. Tons.
To the United States.....	325,145	318,108	336,692
To other places.....	123,587	100,617	95,931
Total.....	448,732	418,725	432,623

Of the exports to the United States 263,225 tons out of the total 325,145 were shipped during the first six months of the year.

The Last of Antimony Mining in Great Britain.—Antimony is about to disappear from the periodical statistics relating to the metalliferous mineral production of Great Britain, says *Iron*. The Glendinning antimony mines, situated at Westerkirk, in Dumfriesshire, have just been definitely closed, and most of the machinery has been sold. The mines were first discovered in the year 1760, but they were not regularly worked until 1793. The ore, which was sulphide, yielded about 50%. Operations in the mines were discontinued a quarter of a century ago, but of late years work has been taken up by a company, which has now, however, been forced to forego bringing the ore into a market at a loss, the price of antimony on the London market having declined to barely £50 per ton. In the year 1889 the prospects seemed fairly bright, the production in that period being 67 tons, valued at £900, but in 1890 only 14 tons were turned out, having a value of £200 at the mines.

IMPORTS AND EXPORTS OF ORES AND METALS IN THE UNITED STATES IN 1891.

The exports and imports of the principal ores and metals from and into the United States in 1891, according to the report of the Bureau of Statistics, were as follows:

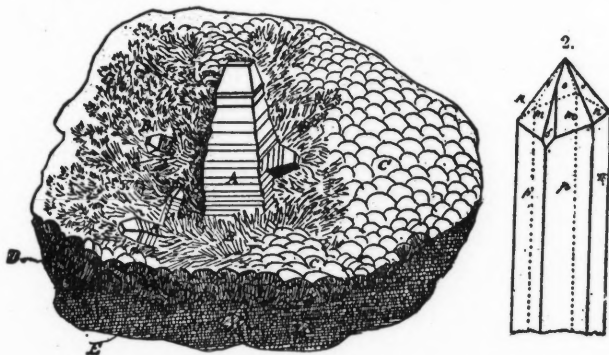
Articles.	1891		1890	
	Amount.	Value.	Amount.	Value.
Copper ore, tons.....	38,606	\$6,565,620	24,159	\$4,413,067
Ingots, bars, and old, lbs.....	69,279,024	8,844,304	10,890,058	1,946,401
Other manufactures of.....		293,619		158,927
Iron and steel and manufactures of.....		30,736,319		27,000,134
Lead and manufactures of.....		173,887		181,030
Mineral oil, crude, galls.....	96,722,807	5,365,579	96,572,625	6,535,499
Naphtha, galls.....	11,424,993	898,137	12,460,066	1,049,498
Illuminating oil, galls.....	531,445,099	34,579,759	550,873,981	39,826,026
Lubricating oil, galls.....	33,210,264	4,999,978	32,095,504	4,768,025
Quicksilver, lbs.....	284,151	145,502	158,241	33,192
Tin, manufactures of.....		250,411		262,343
Zinc ore or oxide, tons.....	5,791	149,435	3,868	195,113
Pigs, bars, plates and sheets, lbs.....	4,294,656	278,182	3,295,584	126,291
Manufactures of.....		38,921		23,587

Articles.	1891		1890	
	Quantity.	Value.	Quantity.	Value.
Asphaltum, crude, tons.....	102,433	\$290,350	65,487	\$223,891
Potassium muriate, lbs.....	78,144,180	1,220,119	63,773,938	978,024
Nitrate, lbs.....	15,292,057	469,591	13,673,798	408,460
Soda nitrate, tons.....	98,086	2,579,930	106,700	3,090,900
Brimstone, crude, tons.....	116,971	2,075,192	131,096	2,147,481
Platinum, unmanufactured, lbs.....	4,822	621,752	5,646	948,987
Plumbago, tons.....	10,618	555,080	12,797	594,746
Tin, in bars, blocks, pigs and granulated, lbs.....	41,146,123	8,091,963	33,821,319	6,869,645
Copper ore (fine copper contents), lbs.....	11,690,312	857,855	6,017,041	394,864
Pigs, bars and ingots, lbs.....	3,154,557	276,263	663,676	57,014
Manufactures of.....		109,819		127,527
Coal, bituminous, tons.....	1,362,387	4,557,931	838,562	2,838,495
Iron and steel, and manufactures of (not including ore).....		41,545,281		44,448,350
Lead and manufactures of.....		2,873,573		1,821,837
Salt, lbs.....	463,455,263	793,115	527,835,772	932,905
Zinc, in blocks, pigs, and old, lbs.....	81,421	41,369	2,112,626	107,017
Manufactures of.....		18,424		53,499

PARAMELACONITE AND FOOTEITE; TWO NEW MINERALS.

Dr. G. A. Koenig has recently described (*Proc. Acad. Nat. Sci.*, Philadelphia, 284-291, 1891) two new copper minerals which occur closely associated with each other upon a mass of cuprite and limonite. They were obtained by A. E. Foote from the Copper Queen mine at Bisbee, Arizona.

Paramelaconite occurs in steep pyramidal crystals (A, Fig. 1) terminated by the basal plane; the pyramidal faces are strongly striated; from the measured angle, $001 \wedge 111 = 58^\circ 50'$, the vertical axis $c = 1.6643$ is calculated. The hardness is 5, sp. gravity, 5.833. Color purplish black;



on the fracture, pitch black. An analysis gave: $\text{CuO } 100.58\%$, $\text{Fe}_2\text{O}_3 \cdot 0.64\% = 101.32$, which is interpreted as: $\text{CuO } 87.66\%$, $\text{Cu}_2\text{O } 11.70\%$, $\text{Fe}_2\text{O}_3 \cdot 0.64\% = 100\%$. It is hence essentially CuO , like melaconite and tenorite, but is distinct in crystallization, and a relation in form to octahedrite is suggested.

Footeite occurs in minute prismatic crystals referred to the monoclinic system (Fig. 2); they are terminated by a pyramid and two domes; the prismatic angle is 49° and 131° . The color is deep blue. An approximate analysis on 0.0165 gr. gave: $\text{CuO } 63.7\%$, $\text{CuCl}_2 \cdot 13.5\%$, $\text{H}_2\text{O } 22.8\% = 100\%$. The calculated formula is $8\text{Cu}(\text{OH})_2 \cdot \text{CuCl}_2 + 4\text{H}_2\text{O}$; this brings it somewhat near tallingite which, however, contains about twice as much chlorine.

In the accompanying illustration Fig. 1 shows the mineral paramelaconite (A) with acicular crystals (B) of footeite, upon mammillary limonite (C, D); this passes into a granular mixture of limonite and cuprite (E), inclosing native copper (F). Fig. 2.—Footeite.

The Silver Brick Case.—Justice James, of the Supreme Court of the District of Columbia, on the 8th inst. delivered the opinion of the court in the silver brick case. The petition of Merrick, Morse and others for a mandamus to compel the Secretary of the Treasury to receive and coin into dollars a silver brick tendered him by the petitioners was denied. Chief Justice Bingham dissented from some of the views of the majority, but agreed with them upon the main questions.

The Tiffany Collection of Gems.—J. Pierpont Morgan has presented to the American Museum of Natural History of New York the famous Tiffany collection of American precious stones. This collection was among the attractions of the Paris Exposition, where two gold medals were awarded it. There are 1,000 gems in all, and the collection cost \$20,000. Morris K. Jesup, said on the 15th inst. that the collection will be placed in the new building of the Museum, which will not be opened to the public until the city votes the necessary appropriation for its completion and maintenance. The time, therefore, when the collection will be made public will depend on the generosity of New York City.

THE MULTIPLE SPEED RAILWAY.

The subject of successful rapid transit for short distances during the hours of congested travel in the larger cities is receiving a larger amount of attention than ever before, many ingenious devices having been proposed to attain the desired end.

The Multiple Speed and Traction Company, of Chicago, Ill., claims to have successfully solved the problem, and it now offers the public a new and ingenious solution of it. By reference to the accompanying engravings the invention will be seen in elevated section, Fig. 1, while the illustration Fig. 2 shows the multiple system carried to the fourth platform.

The operation and construction are as follows: Upon two ordinary T-rails a truck, resembling that of the ordinary railway car, bearing the first platform, is arranged.

As will be seen by reference to Fig. 1, a beam having its bearings on the wheel axles is arranged; on the outer edge of this beam the first platform is built. This platform overlaps the stationary platform or station floor. The wheels extend above the first platform beam; the second platform has underneath it two rails which rest on the wheels, and this platform necessarily travels at the same speed as the circumference of the wheel, while the first platform travels at the speed of the axle. If this device were applied to the Brooklyn Bridge, which has about the maximum length to which the system is applicable, it would have an endless line of trucks on rails making a loop at each terminus, where the stations would be; on the truck the first platform would be arranged, while the second would run on the circumference of the wheels. The result would be two endless sidewalks between the two stations, one raised a few inches above the other.

The cable to start this endless walk would be run at the rate of three miles per hour, at which speed the first platform would move continuously; the second platform would move at the rate of 6 miles per hour. The capacity of the platforms is estimated at over 31,000 people past a given point in an hour. The company claims that at the minimum speed of three miles per hour it is possible to step from the stationary to the moving platform without inconvenience, and from the slow speed to the fast speed platform with equal ease and safety.

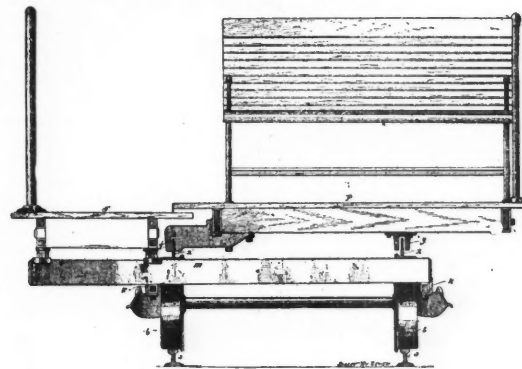


FIG. 1.

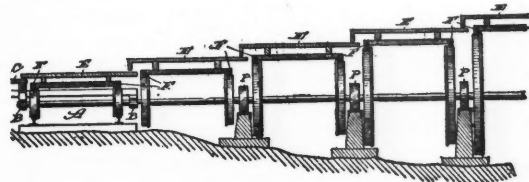


FIG. 2.

The capacity of the train depends on the width of platforms; and if the promenade of the Brooklyn Bridge were removed, and that space, together with the present train space, were used, the capacity of the train would be enormous. The company claims that the low rate of speed at which trucks travel reduces wear and possibility of accident to the lowest possible point, while the high speed platform has no bearing except the rails; and is likened to a belt running over a pulley.

The experimental plant now running at the Exposition Grounds, Chicago, is 900 ft. in length and runs on an elevated structure. This plant, it is claimed, has proven the success of the system. The particular claims made by the company are as follows: Saving in time consumed in other systems by slowing and stopping; saving in amount expended for operating expenses and impossibility of derailment. The company has established an office in New York, where a model of the system is exhibited.

A Large Diamond.—The Antwerp diamond cutting firm, Coeternans-Henrichs, has come into the possession of a diamond which is claimed to be the largest yet discovered in Africa. It weighs 400 carats. The previous largest stone, the property of an Amsterdam merchant, weighed 380 carats. When it is cut, polished and ready for setting the Antwerp diamond will still have a weight of at least 200 carats.

The Gold Product of the Transvaal.—A cry is being raised in the Transvaal for some official statement of the total production of gold in the Republic. It is pointed out that although Johannesburg overshadows all other contributors to the export returns, it is evident that many thousand ounces are shipped from colonial ports which are not reported. The total export from the Cape alone in 1891 was valued at £2,888,000, of which the Randt output would account for only about £2,500,000. The surplus of £300,000, as well as the gold shipped from Natal, represent the production of other districts.

PERSONALS.

Mr. C. P. Schumacher, manager of the Dunkin Mining Company, has resigned that position on account of the pressure of his own extensive mining interests. He is succeeded by Mr. Warren F. Page, at present assistant manager of the Dunkin Company.

The handsome library building, Mr. Andrew Carnegie's gift to Cambria, Pa., to replace the one destroyed in the Johnstown flood of 1889, was formally dedicated February 19th. Numerous addresses were made, including one by Mr. John Fulton, general mining engineer of the Cambria Iron Company.

Herr A. W. von Hofman has been elected president of the German Chemical Society for the current year, and Herren E. Fischer, H. Landholt and J. Wislicenus, vice-presidents. The twenty-fifth anniversary of the society will take place November 11th and 12th of the present year, and a committee has been formed to make the necessary arrangements.

The *Electrical Review*, of New York, has with its last issue completed a life of 10 years. The decennial number celebrating this event is an interesting edition, having a cover artistic in design and containing in its 80 pages much of interest to those engaged in electrical pursuits. The article entitled "Electrical Footprints of a Decade" is particularly worthy of attention. The number is also issued as a souvenir of the fifteenth convention of the National Electric Light Association, held at Buffalo, N. Y.

The late Prince Louis Lucien Bonaparte left his valuable collection of metals to the British nation, and it is now in course of arrangement at the Science Museum, South Kensington, London. This bequest is the result of a promise made to Professor Roberts-Austen, the Prince having been much interested in the Percy collection at South Kensington. The Prince's early papers, which were mainly chemical, comprised an account of a method of separating cerium from didymium, and he used to refer with pride to his having won admission to the ranks of the Legion of Honor by chemical research.

The British Royal Commission for the Chicago Exposition is endeavoring to form a typical collection, illustrating British metallurgy for the British Section, and it is now applying to owners and managers of metallurgical works, asking for specimens of each of their principal metallurgical products, and also for specimens illustrating various processes. Dr. E. J. Ball, the instructor in assaying at the Royal College of Science, South Kensington, has undertaken to classify and arrange the collection which, when complete, will doubtless be fully illustrative of the condition of metallurgy in the kingdom. At the close of the Exposition the collection will be presented to an American museum.

The ordnance plant of the Bethlehem Iron Company, at Bethlehem, Pa., was visited on the 20th inst. by Senators Joseph R. Hawley, Charles H. Gibson, William P. Frye, John T. Morgan, William T. Allison, Henry M. Teller, Charles W. Felton and Joseph M. Carey, and Representatives Charles A. Boutelle, Hilary A. Herbert, Joseph H. Outhwaite, Alfred C. Harmer, William Elliott, Amos J. Cummings and John Sanford. The party witnessed the various operations of fluid compression, hydraulic forging, steam hammering, oil tempering, and all the mechanical work pertaining to gun forging and armor plate making, and expressed themselves as much pleased with the plant's facilities and capacities.

OBITUARY.

Major H. Wadsworth Clarke, member of the American Society of Civil Engineers, died on the 23d inst. at Syracuse, N. Y., of tumor, which affected the heart. He was 54 years old.

Bernhard E. Lehman, founder and owner of the Lehigh Valley Brass Works, at South Bethlehem, Pa., and superintendent of the South Bethlehem Gas & Water Company, died in Bethlehem on the 17th inst.

Samuel A. Sawyer, member of the Produce Exchange and head of the exporting house of Sawyer, Wallace & Co., died in this city on the 24th inst. aged 73. He was heavily interested in the grain and petroleum exporting trade.

SOCIETIES.

The National Electric Light Association held its fifteenth annual convention in Buffalo this week, beginning on the 23d inst.

The *Industrielle Gesellschaft*, of Mühlhausen, Germany, offers a silver medal for a new coal-gas burner which, with respect to perfect utilization of the light produced by the combustion, must excel the ordinary burner. It must, further, be based on a new principle, and be proportionately simple and cheap. A proposed burner must be subjected to at least a twelve months' trial in a Mühlhausen establishment, with a view of testing its efficiency.

The Swiss Society of Chemical Industry has extended the time for the receipt of the competition

essays on sulphate of alumina until December 31st, 1892. It will be recollected that this offer was made with a view of obtaining information as to the extent and effect of foreign substances, especially iron salts, on the sulphate of alumina of commerce. The essays are to be sent to the president of the society, Prof. Dr. Gnehm, Basel, Switzerland.

The Engineers' Society of Western Pennsylvania held its regular monthly meeting in Pittsburgh, February 16th. Mr. William Metcalf read a paper "On Smoke." After reading the paper, Mr. H. K. Porter, for the ladies' committee on abatement of smoke, read a letter from Wilson King, late consul at Birmingham, England, in which was given statements in regard to the comparative cleanliness of the city and atmosphere, and copies of the police regulations governing this subject. Mr. Koch followed, stating that he had worked for many years in Birmingham, and that it was a sad sight to see this city to-day, clean in atmosphere and deserted by workmen. "The streets may be clean and the smoke gone, but it is because the men who made the smoke are gone." Since steel has taken the place of iron and puddling has ceased there is no smoke, for Birmingham to-day only manufactures fine grades of finished product. He endorsed Mr. Metcalf, stating that smoke might be lessened but could not be abolished. When working under Dr. Percy, in London, he had to appear before the committee of the House of Commons as a witness, and that it was proven before that committee that every householder delivered four times as much smoke from each square foot of grate surface as any manufacturer. It is easy to reduce smoke from boilers in a mill, running constantly and evenly for 10 hours, such as a cotton mill; but that it was impossible to prevent smoke in an iron or steel mill where the boilers are subject to demands for large amounts of steam at one moment and then suddenly dormant. Dr. Sutton spoke confirming Mr. King's letter from Birmingham, as noticed by himself when living there. He made especial attack against the smoke issuing from all the small industries of Pittsburgh, ending by saying: He thought the smoke issuing from a bakery haking doughnuts and destroying a ward as one thing, and the smoke issuing from the lofty stacks of a steel works was another.

INDUSTRIAL NOTES.

The Diamond Prospecting Company, of Chicago, has opened an office at Denver, Colo., and placed it under the charge of Mr. T. L. Dee.

Carnegie, Phipps & Co., Ltd., of Pittsburgh, Pa., has issued for the benefit of its patrons a new telegraphic code, dated January, 1892.

Work on the new hot blast furnace at Iron Gate, Va., is nearing completion, and it is expected that it will be in operation by April 15th.

Work will soon be commenced on the erection of a new foundry, 100 x 380 ft., for the Schenectady Locomotive Works, of Schenectady, N. Y.

The National Stove and Vapor Manufacturing Company, of Cleveland, O., has issued its annual catalogue, bound in cloth, and handsomely lettered in gold and silver.

Ulrich & Thompson, of Pittsburgh, Pa., manufacturers of steam heating apparatus, contemplate erecting an extensive addition to their works, which will nearly double their present capacity.

The North Carolina Iron & Steel Works Company, which was organized at Greensboro, N. C., a little over a year ago, with \$1,000,000 capital stock, has commenced the erection of a Bessemer plant.

Work was resumed this week in the puddling department of the Central Iron Works, at Harrisburg, Pa., the men accepting the reduction to \$3.50 per day. Other departments are expected to resume within a short time.

The De La Vergne Refrigerating Machine Company informs us that since January 1st it has closed thirteen contracts for refrigerating machines of an aggregate capacity of 692 tons, and three contracts for ice machines of 150 tons aggregate capacity.

It is believed in Pittsburgh, Pa., that there will be an early consolidation or affiliation of the Green Glass Blowers' and the American Flint Glass Workers' Unions. Both organizations will meet in July in New York, the flint workers at Corning and the blowers at Rochester.

Repairs are being rapidly pushed at the Girard (O.) Furnace. The hosh is being enlarged from 18 ft. to 20 ft., and the stack is being raised from 78 ft. to 80 ft. The furnace is expected to be ready for blast about March 1st next, and will then probably turn out an average of 350 tons of iron per day.

The East Lebanon, Pa., Rolling Mill management on the 19th inst. notified its employes, several hundred in number, that a reduction of wages had become a necessity, and that, if they would consent to a reduction, the works would be kept running. The men refused a reduction, and the mill was closed on the following day.

The stockholders of the Edison General Electric and Thomson-Houston electric companies are notified by their committee in charge of the consolidation to deposit their stock with the New York Guarantee and Indemnity Company of New York or the Old Colony Trust Company of Boston on or before March 7. Either company will issue negotiable receipts therefor.

The True Blue Marble Company, of Rutland, Vt., will replace the mill lately destroyed by fire with an iron building, to be erected by the Berlin Iron Bridge Company, of East Berlin, Conn. The building will be composed entirely of iron and marble and will be 80 ft. in width by 254 ft. in length, the side walls being of iron and marble and the roof of corrugated iron.

The U. S. Commissioner of Customs has allowed \$1,711,061 drawback on tin cans manufactured from imported tin plate exported from the United States from October 1st, 1890, to December 31st, 1891. Also \$92,201 on salt imported and used in curing meats exported during the same period. There were also 115,995,600 lbs. of salt, valued at \$102,856, imported under the act of October 1st, 1890, withdrawn from warehouse and used in curing fish, on which the duty was remitted.

The Contractor's Plant Manufacturing Company, of Buffalo, N. Y., has published its catalogue for 1892. The company manufacture an extensive line of machines for use in construction, mining, milling and agriculture. It pays particular attention to devices for hoisting and the application of machines for use with power, either hand horse or steam, whereby economic results may be attained. The catalogue contains prices, description and practical notes relating to the matters before mentioned.

The long continued depression in the iron business is responsible for the contemplated banking of the Struthers furnace, operated by the Ohio Iron and Steel Company, and of the furnaces operated by Pickards, Mather & Co., in the Shenango Valley, including the two Wheeler stacks at West Middlesex, Pa. It is reported that the shut down at these plants will take place very shortly. The market is very dull, and all the companies have their yards stacked with iron.

Commodore Folger, Chief of Ordnance of the Navy, has closed a contract with the Harvey Steel Company, of Jersey City, N. J., by which the Navy is enabled to use the process of Harveyizing the surface of armor plates. Plants for the purpose will be erected at the Carnegie and the Bethlehem works, where armor plates for the new ships are being manufactured. The ordnance authorities have been apprised of the intention of a firm of projectile makers of this country to experiment with another combination of metals in the attempt to secure a more efficient plate than the high carbon, nickel steel Harvey plate.

The Plate Glass Manufacturers' Association held a meeting in New York last week for the purpose of fixing prices. As a result all glass formerly sold as second quality is now to be sold as first quality at a slightly lower price than the first quality has heretofore been held. The rebate system, which the large jobbers had fondly hoped to see effected, was not definitely acted upon. The arrangements arrived at, however, are perfectly satisfactory to the manufacturers, and will prevent any break in prices. Several of the larger jobbers of New York and Boston, who were seen after the meeting adjourned, expressed themselves as greatly satisfied with the outcome of affairs. Among the manufacturers present were: Edward Ford, of the Pittsburgh Plate Glass Company; Messrs. George W. Crouse, A. M. Sloan and Neri Newcombe, of the Charleroi Plate Glass Company; N. T. De Pauw and W. D. Keyes, of the De Pauw Plate Glass Company, New Albany, Ind.; M. Seih erling and W. L. Clause, of the Diamond Plate Glass Company, Kokomo, Ind.; A. U. Howard, of the Howard Plate Glass Company, and D. E. Wheeler, of the Standard Plate Glass Company, Pittsburg.

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.

2,577. A machine for stamping padlocks. Texas.

2,578. A full outfit of machinery and tools for quarrying brown stone, including derricks, engines, boilers, drills, pumps, channellers, saw mills, planing mills, etc. North Carolina.

2,579. A 10-ton artificial ice machine. Alabama.

2,580. Heating apparatus, good bell and pipe organ for a \$20,000 church. Texas.

2,581. A machine that will crush soft phosphate rock to an impalpable powder. Florida.

2,584. An entire outfit for manufacturing buckets. North Carolina.

2,585. Spoke and handle lathe. North Carolina.

2,586. Boiler, engine and a ginning outfit. Texas.

2,587. Metal roofing for a mill house. South Carolina.

2,588. A combined planer, matcher and molder; a resaw for siding, with 20 in. saw; also shafting and pulleys. Tennessee.

2,590. An engine lathe, 24-in. swing, 8 ft. between centers, and iron planer, 26 in. x 26 in. x 6, and a drill press, 24 in., backgeared. Louisiana.

AMERICAN GOODS WANTED ABROAD.

2,582. Catalogues, prices and discounts of pulverizing and conveying machinery. France.

2,583. A small sized mill suitable to grind large leaves and stalks to an impalpable powder. The leaves and stalks resemble the tobacco plant and are well dried in an oven before grinding.

2,589. Corundum crushers. England.

2,591. Complete plant for manufacturing lap and butt welded pipes and tubes. Europe.

GENERAL MINING NEWS.

ALABAMA.

TALLADEGA IRON COMPANY.—A meeting of the English shareholders of this company has been held at Birmingham, England, to consider the position of the company with a view of raising new capital to carry on the business. It was decided to issue \$200,000 of 7% preference bonds to pay off the liabilities and provide working capital. The American bankers agreed to take one-third of the new bonds, and the Louisville & Nashville Railway Company, on whose line the works are situated, undertook to subscribe for \$60,000 of the bonds. At the meeting the local shareholders agreed to take up the remainder of the bonds, and arrangements will shortly be made for restarting the furnaces. It is proposed to cut down the management expenses and to remove the offices to London.

BIBB COUNTY.

CAHABA COAL MINING COMPANY.—Mine No. 3 of this company, at Blockton, 40 miles from Birmingham, has been burning since the 21st inst. The fire, when last reported, was beyond control and the mine is being flooded. The damage will reach many thousand dollars.

CALIFORNIA.

A special meeting of the San Francisco Chamber of Commerce was held on the 16th inst., to receive the report of the committee appointed to confer with the Miners' Convention in regard to promoting the movement now on foot to reopen the hydraulic mines of the State. The report showed that the stoppage of this class of mining had cost the State the sum of \$10,000,000 per annum, and that all appeals hitherto made had been ineffectual in obtaining relief. The committee then recommended the following resolutions, which were presented by C. L. Taylor:

Whereas, There still remain many millions in gold in the auriferous gravel of California which may be worked by the hydraulic process, a system now under prohibition of the courts because of the debris from said mines injuring the rivers and farming lands on their borders; and

Whereas, A commission of engineers appointed by Congress, at the request of the Legislature of California, has reported a plan by which said mines may again be worked without the injury complained of in the past. And

Whereas, An amicable agreement seems to have been made between the two interests involved on the basis of the report of said commission of engineers, and representatives has been sent to Washington to urge the adoption of the plan recommended by said commission: be it

Resolved, That the Chamber of Commerce of San Francisco respectfully urges upon Congress approval of the suggestions made in the report of the congressional commission.

Resolved, That we believe it will greatly benefit the business interests of this State, and we therefore respectfully request our Representatives in Congress to assist the committees from the State in bringing the matter before Congress and urging immediate action.

The resolutions were passed unanimously, many members speaking strongly in favor of their adoption.

AMADOR COUNTY.

The mining prospects at Sutter Creek continue to look more encouraging as the work of development proceeds, says the *Amador Ledger*. Good progress is making in drifting south at the Wildman mine at the lowest level. The drift is run alongside of the ledge and is being extended at the rate of about 12 ft. per week, and the necessary distance from the shaft for cross-cutting operations is almost reached.

CLINTON CONSOLIDATED MINING COMPANY.—The outlook for this property is encouraging, says the *Amador Ledger*. The shaft has been sunk to a depth of 300 ft. and good ore has been found. The vein is said to be 5 ft. wide. The chlorination works are again running.

SAN BERNARDINO COUNTY.
(From an Occasional Correspondent.)

I am undecided with respect to the character of the veins near Danby. As near as I can judge they are a few true fissure veins and numerous gash veins. They show free milling gold ore on the surface and change into base ore at a depth of 10 ft. or 15 ft. The walls show schlickensides and the gangue is barite or heavy spar. Nothing but surface scratching has been done so far, however. A few miles from this gold belt there are veins of lead carbonate ore, which, in my opinion, are very promising. These veins are true fissures, generally of good size and in a lime formation with good walls. The vein matter carries both gold and silver.

SISKIYOU COUNTY.

Quartz mining is now in full blast with good success on Humburg Creek, says the *Yreka Journal*, and all the companies are doing well. Boyle & Co., at head of North fork, are getting out rock that pays \$60 per ton. Spencer & Co. are working their ledge with a large force, the quartz yielding about \$100 a ton. Van Nader & Marion, at Old Craggy, are taking out \$20 quartz, with improving prospects. Fahl & Lawson have a good ledge on South fork, which is extensive and pays \$10 a ton. Cartwright & Phillips, on North fork, have a ledge which pays \$40 a ton. Henley & Farish, at Rider Gulch, are taking out \$20 quartz. Rabbits & Hart, working a ledge near the forks of Humburg, are getting \$20 quartz. A man named Shefton, from below, has started up work on the Siskiyou ledge, the quartz from which is now being crushed at McCook's mill. Wm. Clark, opposite the Siskiyou, has also commenced taking out quartz with good prospects. Harris & Keaton, at work above the Siskiyou, are realizing \$14 quartz. The McCook mill is kept running steadily, with plenty of custom crushing engaged ahead, to keep the mill in constant operation.

COLORADO.

CLEAR CREEK COUNTY.

PLUTUS.—This mine, situated on Clear Creek at Idaho Springs, has just been sold to a Colorado Springs company. Among the purchasers are Secretary of State Eaton, A. L. Lawton and Chas. E. Newton. The price paid is said to have been about \$250,000. The purchase includes an extensive plant, comprising among other things a 50. stamp mill, hoisting machinery, air compressors, etc.

DOLORES COUNTY.

ENTERPRISE MINING COMPANY.—The electric lighting apparatus on this property is now in working order in the underground workings from the Group tunnel to the Laura shaft, a distance of 5,000 ft. The mine is looking well, says the *Rico News*, and is making its usual daily shipment of five cars of high grade ore per day.

LAKE COUNTY.

SMALL HOPES CONSOLIDATED MINING COMPANY.—This company is making good progress with its drift from the 800-ft. level of the Robert Emmett mine, which it is running into ground leased from the Marian Mining Company, where it is expected that the continuation of the rich ore body, now being worked in the Mahala and Agassiz mines, will be encountered. The recent developments in the Mahala and Agassiz prove the continuation of the Morning Star-Maid of Erin ore chute into that ground, and there is little doubt that it extends through to the Mikado, where the formation is broken by the Iron fault. Should this prove to be the case this will be one of the longest ore chutes known in Leadville. It is now being opened on its southwestern extremity in the Bohn shaft and other new workings just above the Harrison Reduction Works. Going northeast it is broken by the Pendery and Carbonate faults and on the upthrow side outcrops in the Crescent, Catalpa, Evening Star and Morning Star claims; thence it extends northeast, dipping about east, through the Morning Star, Henriett, Maid of Erin, Brooklyn and Clontarf, Wolfe Tone, Agassiz and Mahala claims. Beyond the Mahala and Agassiz is the property of the Boreel and Marian mining companies and then that of the Mikado Mining and Smelting Company, beside which is the Venus mine. The ore chute has been worked in the Chadbourne workings of the Mikado and in the Venus up to the Iron fault. It outcrops on the upthrow side of the fault in the old Argentine property, now owned by the Mikado company, and then extends through the Adelaide mine of the Terrible Mining Company, which is about the extreme northeast limit that the ore chute has been worked at the present time.

(From our Special Correspondent.)

The outlying placers of this section have been neglected for a long time, but the developments in the ground adjoining them to the west of Carbonate fault have been such as to justify the belief that not only those to the south but most directly west of the city will prove of great value, and arrangements are now being perfected by which an early resumption will take place upon them. West of the city the Rhododendron has a

shaft already down about 200 ft., though, of course, at that depth, it has not cut through the lake beds or the mass of moraine material overlying the sedimentary beds at this point. Water may be expected in considerable volume, as the Peoria to the eastward, after reaching a depth of 382 ft., was drowned out. This, however, was some years ago, and pumping plants have vastly improved, so that there now appears no question in the minds of the experts and mining geologists of this district of the ultimate success of the undertaking, the lime-porphry contact undoubtedly existing, and only requiring to be reached to open up further treasures.

DUNKIN MINING COMPANY.—A diamond drill is to be sunk in No. 4 shaft to prospect that ground, and should satisfactory contracts for argentiferous iron be made in the near future, the present force will be increased as well the output, which now amounts to about 80 tons a day.

MAY QUEEN.—The Hayden shaft workings of this property have been for some time under lease to prominent mining men of Leadville, and are now putting out some very fine ore. This is lead carbonate in character, and is found near the level of the Forest City of the Small Hopes company. The streak averages about 25 in. only in thickness, but is resting upon the same intrusive sheet of gray porphyry as that upon which the Mahala, Agassiz and Maid of Erin find their richest mineral, and will probably open up as drifted upon to the eastward.

ST. MARY'S.—On the southwestern slope of Carbonate Hill, the St. Mary's, after years of idleness, has resumed work, and the chances are in favor of a good bench of mineral being found there. This shaft is located between the Weldon and the Pochontas, both of which have found ore west of the Carbonate fault, and is now down about 250 ft. At the 200 ft. level a connection was made with the Weldon, which connection proved that the bench upon which the former mine was working would be found at a lower depth in the St. Mary's. * * *

OURAY COUNTY.

AMERICAN BELLE MINES, LIMITED.—There was shipped from the Silver Bell mine during January 18 cars of ore, or about 180 tons; estimated value, \$1,545; working expenses, \$8,000; expenses at the National Belle mine were \$800. The snow blockade on the railway greatly restricted the shipment of ore.

VIRGINIUS MINING AND MILLING COMPANY.—The electric plant at the Virginus mine is an illustration of the great benefits to mining interests which have been brought about by the application of electricity as a motive power for mining machinery. The Virginus is situated on Mount Sneffles, near Ouray, at an altitude of some 12,500 ft. It formerly cost \$15 per ton for coal with which to operate this mine, as all fuel had to be transported up the mountains on burros. The cost of coal reached \$100 per day, or an aggregate annual expense of \$36,000 for fuel alone. Every cent of this heavy running expense, it is said, is now saved to the mine owners. The new operating force of the Virginus is water power transmitted by dynamos located at Red Creek Cañon, four miles from the mine.

NEW GUSTON COMPANY, LIMITED.—The estimated return for January is as follows: Ore shipped, 1,010 tons; value, \$3,470; mine expenses and supplies, \$3,330; railway freight, \$200; profit for the month, \$2,340. The mine is said to be looking well.

YANKEE GIRL SILVER MINES, LIMITED.—The January return is as follows: Ore shipped, 50 tons; estimated value, \$2,800; working expenses, \$1,500. Owing to the snow block, the railway was only partially opened nine days in the month, during which the shipments were limited to 50 tons of ore. On January 29th the line was again blocked.

PITKIN COUNTY.

BEST FRIEND MINING COMPANY.—A drift was started recently from the second level in the Best Friend and had been run only about 25 ft. when a rich strike was made. A 1½ ft. body of ore was uncovered, from which assays of 3,617 ozs. of silver were obtained, according to press dispatches. Another streak, 1 ft. thick, runs 2,781 ozs., besides which there is a 4-ft. body of ore which averages 250 oz. All of the ore runs well in lead—from 15 to 18%.

DELLA S. MINING COMPANY AND STANDARD MINING COMPANY.—The termination of the celebrated mining suit of the Standard Mining Company against the Della S. Mining Company on the 13th inst. resulted in the consolidation of the mining interests of both companies. The new company was organized on the 15th inst. with a capital stock of \$5,000,000. The suit between the two companies occupied many days for its trial in the United States Court at Denver. The Standard Mining Company sought to recover possession of the Della S. It is claimed that it had an apex on its claim, and that its vein dipped into the Della S., and that, therefore, the entire vein belonged to it. Messrs. Patterson & Thomas, for the Della S., defended on the ground that the vein was broken, and therefore the Della S. was not on the Standard's vein. On the 13th inst. the suit was decided in favor of the Della S. An effort to compromise was made on the following day and finally consummated on Monday. By the compromise the new company was formed. The Standard people get one-quarter of the stock

and the Della S. people get the other three-quarters. The Standard company also is allowed one director in the company but gives to the organization all the ore now on its dump, which is valued at about \$40,000. The claims taken in under this deal are the Standard, Della S., Johnson, Chatfield, Countess and all the rest in this group. They are situated on Smuggler Mountain, at Aspen. A dispatch from the latter place states that the news of the consolidation of the Standard and Della S. companies caused great excitement. Dave Brown will be president and H. M. Holden vice president of the new concern. This settles all litigation.

(From our Special Correspondent.)

The mines of Rock Creek in the southwestern portion of this County have just been visited by your correspondent, and a considerable interest has been excited in that district by the discovering of some very rich mineral on a contact between black shale and porphyry, the latter being the foot-wall. In this section four separate and distinct contacts are met with, the lower ones occurring between the blue limestone and a dolomitic limestone, the upper portion of which appears to have been replaced by ore. This carries in one mine that has been opened on the contact 600 oz. silver per ton, the ore being galena, and the decomposition products of that mineral. Special efforts are being made to open up this country, the Sheep Mountain Mining Company, at the head of Rock Creek, having incorporated for the purpose of driving a tunnel to intercept the fissures that traverse that mountain in all directions, as well as to cut through a so-called contact vein that occurs in the Black Eagle, between black shale and a brown limestone. The entire region has been subjected to intense dynamic movement, resulting in folds and fissures, and a general distortion of the sedimentary beds. Between these beds there are extensive sheets of porphyry. Capital is being interested and, as all the district requires is some money spent upon it, it is more than likely that it will be heard from to some purpose ere long.

IDAHO.

ALTURAS COUNTY.

NETTIE.—Twenty inches of gray copper ore were struck last week. Teams are now breaking a road through the snow to the mine.

LATAH COUNTY.

LITTLE MAID.—The shaft on this property is down 75 ft. and is said to have developed a ledge some 13 ft. between walls with a 4 ft. streak of Galena ore. Assays run from 40 ozs. upward and about 6% lead. The development is similar to that of the Silver King in the same camp.

LEMHI COUNTY.

LEMHI PLACER GOLD MINING COMPANY.—This company was incorporated under the laws of Colorado, October 7th, 1891, with a capital stock of \$5,000,000 in 1,000,000 shares, to acquire and operate placer mines in this county. The president of this company is Geo. J. Boal, of Denver, Colo.; the vice-president, Henry E. Wood, of Denver; the treasurer, John G. Shields, of Colorado Springs, and the secretary, L. H. Jackson, of Denver. W. S. Patterson, of Salmon City, Idaho, is the mine superintendent; A. M. Rucker, of Salmon City, business manager, and E. H. Kellogg, of Salmon City, engineer. These, with J. B. Grant, of Denver, and O. B. Shallenberger, and J. L. Armit, of Colorado Springs, constitute the board of directors.

The property of the company is located on Kirtley Creek, which empties into the Lemhi River, and Carmen Creek, which runs into the Salmon River. For 15 years, it is said in the prospectus of the company, placer mining has been carried on in Kirtley Creek channel, and the ground has always produced at the rate of \$5,000 per acre and upward. The Lemhi Company originally purchased 120 acres in this channel for \$20,000, and subsequently located 2,000 acres adjoining. Since then the company has acquired, chiefly by location and partly by purchase, an additional 2,600 acres, of which the greater portion is estimated to be worth \$5,000 per acre.

The property is well situated with reference to water supply and can be worked during seven months of the year. The gravel is of uniform appearance, but little water-worn and containing a considerable quantity of cement, which, as has been proved, is easily and thoroughly disintegrated by water. It contains few howlders. No permanent bed rock has yet been found. At a depth of about 12 ft., there is a temporary bed rock of decomposed porphyry which is easily disintegrated by water. Beneath it the same class of auriferous gravel as that above is found. The total thickness of the gravel is known to be at least 40 ft., and shafts are now being sunk to bed rock to ascertain what the actual depth is. The property has been sampled by Mr. Henry E. Wood, J. S. Templin, John G. Shields, J. L. Armit and M. E. Smith, which show average values per cubic yard of \$2.07, \$5.79, \$3.10, \$5.05 and \$5.63 respectively. The gold is very fine, giving a value of \$19 per oz. The property has a good dump and there is an ample supply of timber in the near vicinity.

Concerning the development of the property, the prospectus says:

The plan of operations for the present year is conservative one. Ten per cent of the capital stock was in October last placed at the disposal of

the company for treasury purposes at \$1 per share. Quite 80,000 shares have been sold, and so far as needed expended in the purchase of property, water rights, and the construction of ditches and flumes.

"It is estimated that the money derived by the sale of the 100,000 shares will complete the eastern or first section of the Carmen ditch, and without incurring any indebtedness, not thus provided for, carry the company through to production from its properties; and as the construction of the western or upper end of the Carmen ditch can be deferred until next year, it will not be undertaken for the present until we shall have demonstrated the value of our placer ground by treatment of large masses of the gravel, and if thought wise, we can begin that part of the ditch in September, and complete it in time for the spring work of 1893."

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—During January 2,850 tons of ore were crushed, yielding bullion valued at \$60,320; ore valued at \$16,000 was sold to smelters, and \$440 was received from miscellaneous accounts, making the total revenue \$67,760; the total expenses on revenue account amounted to \$35,700.

NAMPA RAILWAY AND CONSTRUCTION COMPANY.—Articles of incorporation of this company were filed with the Secretary of State on the 16th inst. The capital stock is \$1,000,000. The object of the company is to build a narrow gauge railroad from Nampa to Silver City, De Lamar, Sheep Mountain and other important mining camps in Owyhee County. Such a road would do much toward the development of the mines of that section.

SHOSHONE COUNTY.

ARGENTINE.—This mine, after having been idle for almost three years, has resumed work. The mine was recently purchased by Col. J. H. Davey and his son, F. J. Davey. Among the many improvements already made is the building of a new tramway at a considerable expense.

POLARIS.—This mine near Evolution has shipped 10 carloads of ore netting \$80 a ton. Considerable development work has been done and the mine, it is claimed, is looking well.

MICHIGAN.

NORTHERN LAND & MINING COMPANY.—This company has been organized with a capital of \$25,000, divided into 1,000 shares. It owns 6,000 acres of timber and mineral land on Houghton, Baraga, Marquette, Iron, Menominee and Dickinson counties. The stockholders are: Ernest Ballman; Paul Roehm, Chas. A. Wright, Joseph F. Hambitzer, Roger C. Williams, Wm. D. Calverly and John A. Cameron. The following board of directors were chosen for the ensuing year: Ernest Ballman, Paul Roehm, C. A. Wright, J. F. Hambitzer and R. C. Williams.

COPPER.

CENTENNIAL MINING COMPANY.—The Boston Traveller publishes the following concerning this company: "While the stock of the company cannot be assessed it may be increased 25% to 100,000 shares. The new 20,000 shares might, perhaps, be sold for enough to pay for the work needed to reach the lower depths of the conglomerate lode in the No. 3 shaft. It is not unlikely that the management may adopt this method of securing the needed funds, when the copper situation shall warrant it."

KEARSARGE MINING COMPANY.—The report of this company for the year ending December 31st, 1891, makes the following showing: The product of mineral was 2,108,812 lbs., which, at 81.91%, gave 1,727,390 lbs. of refined copper, for which has been realized the gross sum of \$213,790.51; from sales of silver, \$706.73; from interest receipts, \$3,617.60; total, \$218,114.84. The costs have been: Running expenses at mine, \$152,724.69; smelting, transportation and sundry other expenses, \$23,581.40; expended in mine plant, \$17,798.22; total, \$194,104.31. Total net income for year, \$19,020.53. Balance of assets January 1st, 1891, \$144,757.31. Balance of assets January 1st, 1892, \$163,777.84.

The assets were as follows: Cash in bank at Boston and copper on hand, since sold, \$106,392.30; cash on hand at mine, \$40.34; supplies on hand at mine, \$3,421.17; fuel on hand at mine, \$1,063.33; accounts receivable at mine, \$1,143.78; accounts receivable at Boston, \$47,169.67; 250 shares Hancock & Calumet Railroad stock, \$25,000; total, \$184,260.59.

The liabilities were: Drafts outstanding, \$4,037.54; accounts payable at mine \$16,445.21; total, \$20,482.75; balance of assets, January 1st, 1892, \$163,777.84.

	1891.	1890.	1889.
	Cents.	Cents.	Cents.
Cost of copper:			
Mine expenses per lb.....	8'84	8'64	7'27
Smelting, freight and all other..	1'65	1'83	1'94
Construction.....	1'03	'21	....

Total cost per lb.....	11'52	10'68	9'21
Received per lb.....	12'38	15'08	12'58

Net profit per lb.....	'86	4'40	3'37
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The number of tons of rocks stamped in 1891 was 81,424 tons. The large construction cost—\$17,788.22—was expended principally upon a new hoisting plant at No. 2 shaft. Captain Daniell, the superintendent, says that this will be equal to requirements for a long time, and he adds that there are

no requirements for 1892, unless it shall be determined later, to equip No. 1 shaft, in which case the company should look for an increased production.

ST. MARY'S MINERAL LAND & CANAL COMPANY.—This company is regarded as the parent of almost all the present producing copper mines of this region. According to the annual report just issued no sales of mineral lands were made in 1891. Sales of real estate were as follows: Eighty acres in fee simple for \$1,000; 195'65 acres of land, the mineral rights to which were reserved, \$5,630; wood and timber on 558'2 acres for \$11,945; total sales, \$18,575. The real property of the company consisted, December 31st, 1891, of 113,575'07 acres of land, besides the mineral rights in 6,821'69 acres, and the surface only of 160 acres. The cash receipts and expenditures of the year are shown by the report of the treasurer, Arthur G. Stanwood, as follows:

RECEIPTS.	
From payments for land.....	\$8,688.07
From payments for wood and timber.....	21,182.33
From judgment for trespass.....	115.09
From ground rent.....	1,115.28
From interest on contracts and loans.....	3,769.95
From sundry other income.....	8,500.00
From payment of loans.....	2,000.00
Total.....	\$36,998.77
EXPENDITURES.	
Taxes.....	\$10,901.02
Salaries and expenses at Houghton.....	2,588.96
Salaries and expenses at Boston.....	1,966.86
Bills receivable.....	302.44
Distribution No. 18, \$1 per share.....	20,000.00
Total.....	\$35,759.28

The report notes that in April last the directors of the Pacific Copper Company decided to suspend development work on the property, and since then nothing has been done. Where the Atlantic vein was opened it was found to contain no copper, and as this disappointment occurred at a time when the market for copper was low and declining, there was little inducement to continue. The Pacific Company received from subscriptions and interest \$41,400, of which there was spent \$20,000. A large part of the expenditure was for equipment, which is still available, and will, with the \$20,800 remaining on hand, enable the company to go much deeper with the shaft, which was sunk only 130 ft. It is still confidently expected that paying ground will be found, this expectation being based on the fact that the Atlantic workings extend over a surface length of more than 3,000 ft., and to a depth of 2,000 ft. on a vein which runs directly across the Pacific property; a vein remarkably regular in quality, but which for some unknown reason carried no copper in the spot where it was opened by the Pacific. A distribution of \$1 per share was made April 1, 1891. The balance sheet follows:

ASSETS.	
Land, 113,575'07 acres assessed at.....	\$892,203.00
Mineral rights to 6,821'69 acres.....	1.00
Stock in Pacific Copper Company, 20,000 shares, at cost.....	200,000.00
Stock in Iroquois Copper Company, 5,397 shares, at cost.....	26,985.00
Stock in St. Mary's Canal Mineral Land Company, 80 shares at par.....	4,000.00
Land contracts in force.....	3,815.09
Wood contracts in force.....	18,045.78
Bills receivable.....	302.44
Loans, secured by collateral.....	21,000.00
Oash at Houghton.....	590.40
Cash at Boston.....	2,341.30
Total.....	\$1,169,295.01
LIABILITIES.	
Capital stock, 20,000 shares at par.....	\$1,000,000.00
Bills payable.....	26,585.00
Unpaid distributions.....	357.50
Profit and loss.....	142,352.51
Total.....	\$1,169,295.01

IRON—GOGEBIC RANGE.

C. M. Boss, inspector of mines of Gogebic County, in his annual report, submits the following data: Within his jurisdiction there are 14 operating mines, which employ a total of 3,851 men, of which 2,777 are employed underground, and 1,074 on the surface. Among this number there were 15 fatal accidents from causes as follows: Fall of wall, 6; falling substance in shaft, 3; fell down shaft, 1; fell through timbers, 1; explosion of powder, 2. The number of accidents per 1,000 men was 3.37. The number of men employed per fatal accident was 296'23. In a resumé Inspector Boss says: "It has been my observation that the mining companies of this County endeavor to provide all the safeguards for the protection of their men, but in many cases the men neglect to take advantage of these. It has been noticed that of the 13 fatal accidents reported 10 occurred to experienced miners and timbermen. The proportion of fatal accidents to men employed shows a decided decrease as compared with previous years, it being 3'3 per 1,000 men in 1891, against 3'9 per 1,000 men in 1890.

IRON—MARQUETTE RANGE.

CLEVELAND IRON MINING COMPANY.—According to the Iron Ore, this company commenced several years ago to open up the Lake mine under Lake Angeline. It now has two shafts down and three levels started. So serious a hindrance is the influx of water in the working of the ore body that it is quite probable that steps will be taken at no distant day toward unwatering the lake, which is estimated to contain 800,000,000 gallons.

IRON—MEMONINEE RANGE.

HAMILTON-LUDINGTON.—Concerning the flooded condition of these mines, the *Norway Current* says that no new phase has developed. On the 17th inst. the water was considerably above the back of the 6th level in the Ludington, and had been rising somewhat more slowly than at first. The rise was figured to be about 3 in. per hour. The Hamilton Company will require some time yet, perhaps weeks, before the machinery at No. 2 is ready for trial, and any attempt is made to bail out No. 2 shaft. When this is done, whatever may be the result, it is hard to see what more the Hamilton people can do without the co-operation of the Ludington, and the tone of the management is to the effect that it will close up the buildings and wait.

MINNESOTA.

IRON—MESABA RANGE.

Horace V. Winchell, Assistant State Geologist, publishes a very interesting letter in the *Minneapolis Tribune*, relative to iron ore deposits of Minnesota, and particularly of this range. The following is a brief abstract of it:

There is no coal on this range, nor anywhere in the State for that matter, except a few thin seams of lignite, which are of little value, nor is there any possibility of valuable flows of oil. The mode of occurrence of the iron ore is in beds, having a dip south of 12° to 14°. This formation is known to extend from the Mississippi River to the Canadian boundary line, a distance of about 140 miles. Over this entire distance there are outcrops of the Huronian formation containing beds of iron ore. East of the Duluth & Iron Range Railroad, however, the ore beds are covered by strata of black slate or of gabbro. The search for ore in this section of the range must necessarily be carried on by drilling and not by shafting and test pitting, as is done west of the railroad. West of the Duluth & Iron Range Railroad, 12 miles, there have been uncovered during the last four months, deposits of ore which for area of territory covered, ease and therefore economy of mining and freedom from impurities, taken altogether, have rarely if ever been equaled. There is a covering of but a few feet of clay and gravel on the ore, which is found lying in sheets, with a thickness of from 40 ft. to 80 ft., and so soft that it can be scooped out with a steam shovel. But little water is found. These test pits have covered an area of nearly 40 acres on some of the properties now under development, and ore is found in nearly all.

The quality of the ore on this range, however, is not going to equal that on the Vermilion. The average cost of mining a ton of ore on the Vermilion range is \$1.80, and I am informed that responsible parties, having visited the Mesaba range, stand ready to make contracts to mine and place on the cars all the ore on some of the largest properties on the range for 50c. a ton.

In township 58-16 are the greatest workings at present. The ore seems to lie along the south side of an outcropping ridge of greenstone, or, more properly, of green schist, which runs west and then southwest through the northern part of the township. How far the ore extends south is at present unknown. If there are other ridges of green schist south of the one followed by the present workings there is good reason to expect large bodies of ore on their slopes also. Judge J. T. Hale, of Duluth, was one of the first who understood the relation of the greenstone range to the ore formation and took advantage of his geological knowledge to secure control of thousands of acres on the range. Developments have so far proven that he was wise, indeed, and that his lands are well located for yielding immense quantities of ore.

The Biwabik Iron Company is controlled by the Merritts and Donald Grant, of Faribault. It owns 33 forties. The iron shown up so far is in the northeast quarter of section 3-58-16. Since last August there have been 14 test pits sunk on this property varying in depth from 12 ft. to 97 ft. Ore was found in 11 of these pits, and the thickness of it determined to be from 25 ft. to 80 ft.

The Cincinnati Iron Company controls 320 acres just east and south of the Biwabik. Seven test pits have been sunk, proving that there is ore on the property of considerable thickness. In one of the pits 50 ft. of ore has been penetrated, and the bottom is not yet reached. The company is controlled by Hale, McKinley & Humphreys.

The Canton Iron Company has 200 acres west of the Biwabik, south of the greenstone ridge. Fine ore has been found in three pits on this property from 20 ft. to 30 ft. thick. This company is practically the same as the Minnesota Iron Company, which operates the mines at Tower, on the Vermilion Range.

The Hale location in the southwest and northeast quarters of township 58, range 16, makes a fine showing. The ore here is found in the first pit only 2½ ft. below the surface. Six other pits have encountered the ore and two have shown up 24 ft. and 30 ft. respectively. It is of good quality and the ground lies well for a continuous deposit over the whole 40.

The Chicago Iron Company controls 720 acres of land southwest of the Canton, in sections 3, 4 and 9, 58-16. But little work has yet been done on the property, but it is well located and will probably soon show considerable ore.

The McKinley mine is in sections 8 and 18, 58-16.

Work has been prosecuted here for a couple of months. Ore of good quality has been found and more is being exposed daily. This ore is said to be of slightly better grade than the average on the range.

The Mountain iron mine lies in section 3, township 58, range 18, the first large body of ore on the western Mesaba, found nearly a year ago. This is 12 miles west of the Biwabik and Cincinnati, and is controlled by the Merritts and their associates. The quantity of ore found there was sufficient to interest capitalists in the construction of a railroad from Duluth to the mine. Captain Morcom, an old iron miner and expert, has estimated 1,000,000 tons of ore in sight on this property and says that double that amount could be shown up with a little more work. He estimates the average thickness of ore there at 40 ft.

The ore on this range is soft, with occasional hard streaks of a few feet in thickness. It is a mixture of hematite and limonite and contains about 60% of metallic iron. Most of the analyses so far made indicate that it is low in phosphorus and will make Bessemer steel. Some analyses show a small percentage of manganese.

BUCKEYE IRON COMPANY.—This company, with ex Gov. J. S. Campbell, of Ohio, as president, has recently purchased of the Itasca Iron Mining Company 7,200 acres of mineral land situated in Ramsey and St. Louis counties, \$50,000 worth of improved machinery and steel rails for 7 miles of track, for about \$1,000,000. The deal was consummated in Chicago, Ill., on the 22d inst.

GREAT NORTHERN MINING COMPANY.—This company recently increased its capital stock from \$1,000,000 to \$3,000,000 on the strength of the purchase of 800 acres of land from the Mesaba Central Land and Exploration Company, for \$60,000 cash and \$83,333.33 in stock, the market price of which is 12% of par. The latter company now has 1,760 acres left in 56, 57 and 58-18. Its capital stock is \$200,000.

MONTANA.

BEAVERHEAD COUNTY.

GOLDEN LEAF, LIMITED.—Mr. J. Henry Longmaid, the company's general manager, reports the January output of the company as follows: "Empire: Sixty stamps ran 29 days, crushed 4,500 tons, producing in gold bullion \$13,000; store and sundries, \$600; equal \$13,600; deduct revenue cost for month, \$9,500; estimated profit for month, \$4,100 (no concentrates produced). Golden Leaf: During the month the mill crushed 750 tons of first class ore and 375 tons of second class ore for concentration only, yielding in gold bullion and concentrates \$12,500; estimated profit from store and sundries, \$800. In addition to above, net profit from Excelsior mine last month will be \$2,000, equal \$15,300; deduct revenue cost for month, \$6,500; estimated profit for the month, \$8,800; total estimated profit, \$12,900. Expended on capital and development work, Empire, \$3,650." The manager adds: "We have struck the ore body in Wadham's main tunnel. Pans and settlers for extra 10 stamps will be started about March 1st. Have begun to sink in the main shaft of the Golden Leaf. Empire's poor output last month was attributable to want of water. Empire No. 3 shaft is in soft ground, and developments promise well at the lower level."

JEFFERSON COUNTY.

ELKHORN MINING COMPANY, LIMITED.—During January the mill worked 20 days and crushed 1,107 tons of ore, producing bullion valued at \$31,675; there were 294 tons of smelting ore sold, valued at \$24,714, making the total produce \$56,389. The total expenses were \$24,910, and the estimated profit for the month \$31,479.

LEWIS & CLARK COUNTY.

MOUNTAIN VIEW.—A strike of \$90 rock is reported in this mine. There are several other properties in the same locality which look promising.

WHITLACH UNION MINE.—A company is being organized to work this famous group of mines, which were formerly such large producers. They have been idle since 1873, as it was thought they were exhausted, but the new company has declared its intention of prospecting below 750 ft., where work was left off.

MADISON COUNTY.

GARNET GOLD MINING COMPANY.—This company, whose properties are located at Pony, has been lately incorporated under the laws of Illinois, with a capital stock of 500,000 shares of \$10 each, of which 150,000 shares are in the treasury. This company succeeds the Pony Syndicate and acquires all its properties, consisting of the Galena group of mines, comprising altogether 18 claims. The property is principally a gold one, and it has been doing development work for the past 28 months. The syndicate is composed largely of St. Louis and Chicago capitalists. It is about to put in a Rand drill to facilitate the work which heretofore has been done by hand.

RIVERSIDE.—The report is current of a very rich find in this mine 23 miles from Bozeman. It is said that in the tunnel, through which the Riverside mine is developed, a 4 ft. vein of ore rich in gold and silver has been struck.

MISSOULA COUNTY.

IRON MOUNTAIN MINING COMPANY.—This company has declared a dividend of 3 cents per share,

payable February 25th. It is estimated that the mine shows three years' supply of ore, and the affairs of the company are thought to be in a most promising condition.

PARK COUNTY.

MOUNTAIN HOUSE COAL COMPANY.—This company has been organized with a capital of \$500,000 to work 320 acres of coal fields which were first opened in 1882. The coal at that time, after being hauled 17 miles on wagons, sold for \$9 a ton. It is now proposed to deliver it at Butte for \$4 per ton.

SILVER BOW COUNTY.

GAMBETTA.—Work on this property belongin to John A. Leggat is about to be resumed. No machinery is being placed over the 400-ft. shaft.

NEVADA.

ELKO COUNTY.

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

BELLE ISLE MINING COMPANY.—Cross cut from No. 1 vein, 3,500-ft. level, extended 6 ft., cutting a small vein of good ore.

DEL MONTE MINING COMPANY.—No. 2 joint raise stopes in second level produced 12 tons first class and 11 cars second class, assay value \$265 and \$31 per ton. Connection has been made with raise from west drift from No. 1 joint raise with the stopes, exposing high grade ore the entire distance. West drift from No. 1 joint raise has been advanced 12 ft. in vein matter showing seams of ore.

NEVADA QUEEN MINING COMPANY.—Work in No. 1 south drift on second level was suspended while starting No. 2 raise, which has been put up 20 ft., cutting into the vein at 17 ft., exposing 42 in. of very high grade ore, assaying \$150 to \$700 per ton. Above this stratum is low grade ore assaying \$3 to \$27 per ton.

NORTH BELLE ISLE MINING COMPANY.—An intermediate drift has been started north from the No. 1 winze below the 400-ft. level, progress 9 ft., showing a good-sized vein of high grade ore. No. 4 north drift, south 500 ft. level, extended 8 ft. The ground swells badly and requires timbering. Hoisting at the upper works will be suspended for the present. Hoisted 33 cars of second class ore.

NORTH COMMONWEALTH MINING COMPANY.—Small seams of ore are showing in the face of the west drift from No. 1 cross-cut in the second level. No. 1 raise from west cross-cut, progressed 20 ft. in the vein, in low grade ore. Stopes above the level east from winze produced 5 tons, \$285 per ton assay value, and 67 cars second class, \$47 per ton.

ESMERALDA COUNTY.

HOLMES MINING COMPANY.—At the annual meeting of this company, held in San Francisco, Cal., on the 9th inst., the following were elected trustees: W. J. Sutherland, Ramon E. Wilson, Eugene P. Murphy, Edward S. Spring and James W. Burling. W. J. Sutherland was re-elected president, Ramon E. Wilson, vice-president, Charles E. Elliot was appointed secretary, D. H. Jackson, superintendent and the Nevada Bank, treasurer.

From the superintendent's report we learn that the mine was operated eleven months during the year. It was closed down on December 1st in consequence of the continued low price of silver and the miners rejecting the scale of wages offered them by the company to take effect at that time. Much prospecting has been done, nearly 6,000 ft. having been run in upraises, winzes, crosscuts, drifts and tunnels. All of this work has been done at various points in and on the company's property between the 600-level and the 1,450-level. During the year several new ore bodies have been found of more or less magnitude, out by mixing the different grades systematically a fair grade of ore has been sent to the mill. The Enterprise ground, acquired during the past year, has produced several small bodies of high-grade ore, thus keeping up the average value of all the ore produced. It has been partially explored for a distance of about 600 ft., with some good prospects in sight at this time. At the north end of the Sutherland tunnel a winze has been sunk 81 ft., showing high-grade ore all the way. The following ore has been shipped to the mill: Net tons, 10,565.122; salt used, 10%; bullion returned as per report of San Francisco office, silver, \$399,046.05; gold, \$1,914.79; total, \$400,960.84. The receipts amounted to \$333,657. The disbursements balance this, leaving a cash on hand, \$169.86.

EUREKA COUNTY.

(From our Special Correspondent.)

The present monthly shipments from the principal producing mines of Eureka District are about as follows: Diamond, 800 tons; Jackson, 150 tons; Bullwhacker, 120 tons; Richmond, 100 tons; Phenix, 30 tons; Williamsburg, 15 tons; Silver West, 15 tons; and Banner, 15 tons. Several producing mines are not shipping at present, owing to the roads being blockaded with snow. It is estimated that when spring opens the monthly output of all the mines of the district will run from 2,500 to 3,000 tons. As nearly all the mines are being worked under lease or on the tribute system, the actual output will mainly depend on the number of miners who will take chances on leasing. The majority of them will be dependent on their credit at the stores in Eureka; business being in a very depressed condition, the merchants

are exceedingly cautious about selling goods on credit, therefore the chances are against the output over-reaching the estimate above given. In the estimate given herewith the Eureka Consolidated Mining Company, with a monthly shipment of about 600 tons, is omitted.

DIAMOND MINING COMPANY.—From 90 to 100 men are employed in and around the Diamond mine. This property is prospecting splendidly, and has become the principal mine of Eureka District. A big body of ore is just reported struck 150 ft. below the lower tunnel level.

EUREKA CONSOLIDATED MINING COMPANY.—The principal operations in the Eureka mines are confined to the locality of the 900-ft. level. It is reported that the quantity of low grade ore in sight is estimated at 7,000 tons. The company is shipping ore that carries as little as 11 ozs. silver per ton, with some gold. This material carries a large percentage of iron and some lead, and is being mined with profit to the company.

Smelting operations are entirely suspended, owing to the high rates of transportation of smelting materials. A reduction of freight rates would undoubtedly become the means of materially increasing the output of the district, and result in a resumption of smelting at home.

RUBY MINING COMPANY, LIMITED.—Operations at the Dunderberg mine by the company are now confined to the 500-ft. level. There are seven tributaries and four miners at work. The mine is producing very little ore, it being practically worked out. The shale, which underlies the ore-bearing limestone, dips westward, and the company has very little mineral ground below the 600-ft. level, being cut off by the claims of the Golden Rule Company.

STOREY COUNTY—COMSTOCK LODGE.
CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—A shipment of bullion, valued at \$12,638.11, the first on February account, was reported from this mine on the 15th inst. The cash balance carried over from January was \$33,917.49.

SAVAGE MINING COMPANY.—The last official letter from the superintendent says: "There have been hoisted 752 cars of ore from the 750, 950, 1,100, 1,400 and 1,500 levels; shipped to the Nevada mill 682½ tons and milled 682 tons; average battery assay, \$24.21. Bullion yield for the week, \$11,559.90."

(From our Special Correspondent.)

SAN FRANCISCO, Feb. 19.
The following is the weekly statement of ore extracted from the Comstock mines, and milled, with the battery assay values:

Mine.	Tons extracted.	Tons milled.	Assay Values.	Feb. 13.	Feb. 6.
Con. Cal. & Va....	1,019	980	\$28.50	\$32.95	
Belcher.....	245				
Hale & Norcross..	1,477	420	20.72	21.48	
Overman.....				18.73	
Savage.....	1,752	682	24.21	21.64	
Yellow Jacket....	1,266				

* Cars of ore being saved. † Cars hoisted. ‡ Shipped to Vivian Mill.

As the date of the Hale & Norcross annual election approaches reports are rife as to whether the present directors will make a fight to retain their positions. During the week the stockholders who have banded themselves together in the interests of reform, in the management of the several Comstock mines, appointed a committee of three to confer with J. L. Flood with reference to changes in the Hale & Norcross directorate and to invite his co-operation. Mr. Flood expressed his willingness to assist in ousting the notorious Levy from the presidency, and in fact promised to co-operate in any way he could in furtherance of the brokers' wishes. The latter, however, worked hard and found that they could count on nearly 50,000 of the 112,000 shares of Hale & Norcross stock at the election, and, strong in that knowledge, intimated to J. L. Flood that whatever honor or profit resulted from the victory, they desired it understood that they should reap the reward. While they intended electing four directors, he could have the other three.

On these terms Flood refused to have anything to do with the "reform" combine. This is something that the stockholders ought to be devoutly thankful for and it reflects little credit on the "reform" party that Flood's assistance was sought. With him controlling the Hale & Norcross, the trio forming the Comstock Mill and Mining Company would have played the same game that the Nevada Milling Company has played with such disastrous effect to Hale & Norcross stockholders during the past few years.

Flood is evidently chagrined at the independent attitude taken by the brokers, and has concluded to take a hand in the Hale & Norcross election, but has declined to say to whom he will give his support. This declaration on his part has put the syndicate of brokers on their mettle, and the following "call" will appear in the local papers tomorrow.

"TO HALE & NORCROSS STOCKHOLDERS.
"The exposure of the mismanagement of this mine

"The city press is either directly or indirectly so entangled with the Comstock magnates that this 'call,' it is reported, has been in every case refused as a news item. They have consented to receive it only as an 'ad' without making any comment.

calls for action by the stockholders. The undersigned represent a body of brokers and stockholders who are making an effort to correct the abuses prevalent in the Comstock mines, and they request all stockholders of the Hale & Norcross Mining Company to report to any one of the under-mentioned firms, and give proxies or stock that the same may be used at the annual election, to be held March 9th, 1892. [Signed]

J. S. BARRETT & CO. O. R. JONES,
COFFIN & SANDERSON, L. MARSHALL,
COPE & ENGLISH, C. E. PAXTON,
DIXON & MILES, H. H. SHINN,
W. EDWARDS & CO., J. M. SHOTWELL,
H. G. GURNETT & CO., H. L. VAN WYCK,
HADLEY & DOUD,

WHITE PINE COUNTY.

(From our Special Correspondent.)

CHAINMAN.—Henry Lyons deposited in Eureka last week a bar of gold bullion valued at about \$5,000, the result of a clean up in the Chainman mine. * †

NEW MEXICO.

GRANT COUNTY.

GRAND CENTRAL.—This claim at Central, which has made a reputation, and which created such a flurry of excitement a few months ago, is being worked steadily, says the Silver City *Enterprise*. The shafts are now down 40ft. A few tons of ore are on the dump and is estimated to be worth \$200 per ton. As depth is attained the ore becomes a heavy sulphide, and the vein widens perceptibly. The main vein is about 200 ft. east of the present workings, and is 2 ft. wide. The working shaft is in ledge matter.

PEERLESS.—This mine, in the Bear Mountain district, has been relocated. It was sold several years ago, says the Silver City *Sentinel*, to the Peerless Mining Company, of St. Louis, and a large sum of money was expended in machinery and development. The company became involved in financial difficulties, and the mine was sold about four years ago and the company reorganized. All the old stockholders were allowed to come into the new company, on payment of an assessment of five cents per share. The new company was known as the Stewart Mining Company. The property was leased, but the stockholders never received anything out of the property. The machinery, which cost several thousand dollars, was sold for a few hundred, and last year the assessment work was allowed to go by default, which resulted in the relocation of the mine.

GRANT COUNTY MINING AND MILLING COMPANY.—The Bremen mill at Silver City, operated by this company, is temporarily shut down on account of the heavy roads which have made it almost impossible to haul ore this month.

STE. HELENE.—This property, which is one of the oldest in the Central district, is working steadily, and has a shaft 110 ft. deep. A drift on the 100-ft. level has penetrated the ledge 100 ft. to the west side, all in ore. The vein averages 2½ ft., and, like all in this district, enlarges as depth is reached, says the Silver City *Enterprise*. Three shifts are employed, and a big pile of ore is on the dump. The mine is operated at present by a whim, but a steam hoist will shortly be erected. The main or north end shaft is 85 ft. deep. The vein from the surface measures 2½ ft. in width, and the ore will average \$40. There are 25 tons of ore on the dumps.

TEXAS.—The south extension of the Grand Central has a shaft 36 ft. deep with three strata of ore, the main streak being 12 in. wide. The total width of the ore body is 3 ft. About 8 tons of ore are on the dump, said to assay 274 ozs. in silver and \$32 in gold per ton. The property is owned by Messrs. Holliman, Ross and Acorn. The ore shows wire silver.

SIERRA COUNTY.

SILVER MINING COMPANY OF LAKE VALLEY.—This company has made a contract for one year with the El Paso smelter, and will ship ores to that place during 1892.

NEW YORK.

ONONDAGA COUNTY.

SOLVAY PROCESS COMPANY.—A spy, in the interest of the Standard Oil Company, it is said, has been occupied for the last two months in obtaining drawings of the secret machinery of this company.

A man giving his name as A. C. Montenegro, and his home as Louisville, Ky., succeeded in gaining admission to the closely guarded works by disguising himself and carrying a dinner pail to one of the employes. While he was waiting for the pail his method was cautiously examine the machinery in the apparatus room.

He would not have been detected had not E. N. Trump, mechanical engineer for the Solvay Company, caught him carrying away patterns. A secret investigation was at once commenced.

The man was watched for several days, and finally a search warrant was issued. The detectives went through Montenegro's room, and found some things that about paralyzed the Solvay process managers. Montenegro had made nearly complete and fairly accurate drawings of the interior of the soda ash works, and the arrangement and construction of the various machinery used in the manufacture of the product. A satchel full of drawings, all finely executed, were found in his room. There were confiscated by the officers. The work was evidently all from memory.

It is said that the Standard Oil Company has a

scheme on foot to start a soda ash manufactory at Louisville, Ky.

NORTH CAROLINA.

STOKES COUNTY.

GREENSBORO COAL AND MINING COMPANY.—This company has decided to erect a complete mining plant at once. The coal has proved to be of a semi-bituminous character, with good coking qualities. The engineers report that the coal may be mined and put on the cars at 65¢/70¢ per ton. The veins thus far explored prove very promising, the first being 36 in. thick, the second 54 in., while the third has not as yet been opened.

PENNSYLVANIA.

COAL.

Most of the collieries in the Hazleton region have notified their employes that semi-monthly payments will be discontinued after March 1st.

Ground has been broken for the new works of the Lehigh & Wilkesbarre Coal Company, at Ashley, Pa. It is the intention of the company that this shall be one of the largest breakers in the world. It will not be completed for a year.

LAWRENCE & BROWN.—Work has again been suspended in this colliery. The property was seized by the sheriff at the instance of land owners.

LEHIGH COAL AND NAVIGATION COMPANY.—At the annual meeting of the stockholders of this company, held at Philadelphia on the 23d inst., the following board of managers were elected for the ensuing year: Joseph S. Harris, president; Edward W. Clark, Francis R. Cope, Chas. Parrish, James M. Willcox, Edward Lewis, Samuel Dickson, Edward B. Leisenring, Abram S. Hewitt, Thomas McKean, Charlemagne Tower, Jr., and Edward S. Buckley.

PHILADELPHIA & READING COAL AND IRON COMPANY.—The statement of this company for the month of January shows gross receipts of \$1,532,040.95; gross expenses (including operating expenses), \$1,522,779.90; colliery improvements were \$66,886.33; profit from mining, \$9,621.05; one-twelfth of current year's fixed charges, \$65,500, leaving a deficit of \$56,238.95, showing a decrease of \$943.60, as compared with a deficit of \$57,182.55 in January, 1891. The deficit for the two months of the current fiscal year is \$49,414.90, against \$115,314.56 during the same period last year.

SOUTH DAKOTA.

LAWRENCE COUNTY.

BIG MISSOURI MINING COMPANY.—This company has been organized to work a group of low grade gold mines adjoining the Homestake and embracing the Big Missouri, Little Maud and General Custer mines. The Uncle Sam mill at Perry has been leased, and its 60 stamps are crushing 250 tons per day.

GOLDEN REWARD.—At the chlorination works of this company a largely increased force of men is at present employed putting new machinery in place, including a 35-ton steel chlorination barrel. The large revolving roaster, 36 ft. in length, was started up Friday afternoon and runs like clockwork. In rear of the building a large revolving automatic dryer is being arranged. Owing to its weight, some 16 tons, a very substantial foundation had to be built. With these additional improvements the capacity of the plant will be increased to nearly 100 tons per day.

TENNESSEE.

POLK COUNTY.

DUCKTOWN SULPHUR, COPPER AND IRON COMPANY.—This company has a large number of hands employed in getting the mines into running order. It is the intention of the company, in connection with the mines, to erect a copper plating mill and a plant for manufacturing copper wire. Orders have been placed with foundries for the machinery, which is now in course of construction.

UTAH.

SALT LAKE COUNTY.

The Utah Sampling Company has filed articles of incorporation in the county clerk's office. The capitalization is placed at \$30,000 divided into 3,000 shares at \$10 a share. The officers and board of directors are as follows: E. W. Keith, president; John H. McChrystal, vice-president; F. A. Keith, treasurer and secretary; N. A. Robertson and W. M. Bradley.

UTAH COUNTY.

NORTHWESTERN MINING COMPANY.—This company, which owns large interests in Miller Hill, American Fork Cañon, will develop its property by a tunnel 6,000 ft. long, large enough for a double track. It is to start from the old Wild Dutchman mine and go through Miller Hill to the old Miller mine. It will cut the hill to a depth of 2,000 ft. The tunnel will cross cut all the veins in the hill. Work is to commence just as soon as spring opens.

WAHSATCH COUNTY.

SALT LAKE GILSONITE COMPANY.—Articles of incorporation were filed yesterday with the Clerk of the Third District Court of the Salt Lake Gilsonite Company. The incorporators are George F. Culmer, William H. Jennings, H. L. A. Culmer, St. V. Le Sieur and William H. Culmer. The capital stock of the company is \$150,000. The object is to conduct a general asphaltum business in Utah. The company owns and controls six

mines at Parlette, Wahsatch County, which it has hitherto operated, but has not incorporated.

WASHINGTON.

SPOKANE COUNTY.

SILVER QUEEN MINING COMPANY.—Articles incorporating the Silver Queen Mining Company have been filed at the auditor's office. The capital stock is \$1,000,000, divided into shares of \$1 each.

FOREIGN MINING NEWS.

ARGENTINE REPUBLIC.

People at San Blas a seaport, are much excited over the discovery of silver at the bottom of the bay. Divers, it seems, had brought up a considerable quantity of black metallic sand which seemed upon examination to contain silver in small pellets.

AUSTRALIA.

NEW SOUTH WALES.

BROKEN HILL PROPRIETARY COMPANY, LIMITED.—The following results have been announced:

1892.	Treated.	Yield	Silver	Oz.
Week ended Jan. 7th	Tons.	silver lead.	oz.	Per ton.
" " 14th	5,286	846	179,724	34
" " 21st	5,453	818	179,949	33
" " 28th	5,596	894	178,752	32
" " Feb. 4th	6,094	914	195,008	32
" " 11th	6,218	995	198,976	37

The usual monthly dividend of 2s. per share has been declared for the month of February, making 4s. per share paid thus far this year. The company has 120,400 oz. surplus silver on hand. The shares were quoted in Melbourne, Feb. 10, at £6 13s. 6d.

CANADA.

PROVINCE OF QUEBEC.

GENERAL PHOSPHATE CORPORATION, LIMITED.

—According to the report of the directors of this company for the period between June, 1890, and October 31st, 1891, submitted to the shareholders at their annual meeting January 20th, 1892, the company was formed in June, 1890, for the purpose of acquiring and working phosphate properties in various parts of the world. Two properties known as the "High Falls" and the "Ross Mountain" containing 2,666 acres of land, in Quebec were purchased. The purchase money of these two groups of properties with the legal and other expenses for this transfer to the corporation amounted to £98,863 11s. 6d. The cash payment to the vendors was £10,000, the balance of the purchase money being secured by mortgages on the properties and acceptances of the corporation.

Mr. George Stewart, the vendor, guaranteed to mine and deliver in Montreal 10,000 tons of phosphate of an average grade of 75% within 12 months of the time the requisite machinery should be in working order on the property. May 1st, 1892, was fixed as the date on or before which the guarantee was to be formed. Mr. Stewart commenced actual mining operations in April, 1891, since which time the properties have been vigorously worked. An unforeseen circumstance interfered with the sending out of ore to market at a point of the Du Lievre River between certain portions of the corporation's properties, where there is a shallow place known as Long Rapids, which permits of the passage of barges in the early part of the spring only. To get over this difficulty the Canadian Government is constructing a dam across the river, which, when completed, will give about 7 ft. of water throughout the summer.

About 1,000 tons of phosphate rock have been sold, realizing £3,390 12s. 10d., and there are at present about 3,000 tons of rock of all grades lying at the mines ready for shipment.

The mining operations have resulted in a most satisfactory showing of phosphate, and good marketable ore has been shipped from each of the mines worked. Mr. Stewart has recently been in negotiation with the directors as to his guarantee of an output of 10,000 tons of ore by May 1st, 1892, and his liability upon the failure of forfeiting the sum of £10,000. The directors, having carefully considered the whole situation, have entered upon an agreement with Mr. Stewart whereby he surrendered the £10,000 upon terms favorable to the corporation.

According to the balance sheet on October 31st, 1891, the nominal capital of the company was £1,000,000, divided into 99,500 ordinary shares of £10 each, of which there had been issued 19,598 shares upon which the sum of £2 per share had been called up, making a total of £39,196 paid in; also 500 founders' shares of £10 each, fully paid, 200 of which were issued, realizing £5,000; the amount of calls in arrears was £2,400; so that the total called up paid in capital of the company was £41,796. In addition £100,000 in first mortgage debentures had been issued. Bills payable amounted to £3,818 6s. 5d., and other liabilities amounted to £18,450 14s. 3d.; making a total of liabilities of £169,065 0s. 8d. The mine expenditure from June 13th to October 31st was £18,507 10s. 6d., and the amount realized from phosphate sales was £3,390 12s. 10d., making a net loss of £15,167 11s. 8d. on operations. The company had cash in hand in bank on October 31st to the amount of £7,374 17s. 8d.

According to the new agreement with Mr. Stewart he surrendered the £10,000 in cash, which was in the suspense account to be paid to him, in consideration of £1,000 in cash, and 300 fully paid shares of the corporation. He is now undertak-

ing to complete the delivery of the before mentioned 10,000 tons by August 1st, 1892, when a further 500 shares will be issued to him, and he forfeits shares pro rata for every ton of phosphate not produced. This company expended £7,798 10s. 6d. in connection with a concern which will shortly be issued for the manufacture of superphosphate on a large scale. A provisional contract has already been entered into, under which the superphosphate company is to purchase low grade ores from the corporation up to a maximum of 15,000 tons per annum, with the option to purchase 15,000 tons additional if required, thereby utilizing ores which cannot profitably be shipped to Europe.

GERMANY.

PRUSSIA.

A dispatch received from Königsberg, East Prussia, on the 13th inst. reports a peculiar and fatal accident that has occurred near that place. The Government of Königsberg is bounded on the north by the Baltic, and along the shores of this sea is obtained a large proportion of the world's supply of amber. This substance is there partly cast up by the sea, partly obtained by means of nets, and partly dug out of a bed of fossil wood.

On the night of the 12th inst. an exceedingly heavy sea was running in the Baltic, and the high waves swept far inland, past their usual bounds. Close to the shore near Palmnicken, a small fishing town, is an amber mine in which a number of men were working. They had no knowledge of the fact that the rising tide was bringing the heavy seas in dangerous proximity to the entrance to the mine. Suddenly the water began to pour into the mine in a perfect torrent, filling the small workings. The men made a rush to escape, but six of them found it impossible to breast the torrent in which they were engulfed and were drowned.

TASMANIA.

MOUNT BISCHOFF TIN MINING COMPANY.—This company has declared its 17th dividend at the rate of 10s. per share, amounting to £6,000. The company has now paid in dividends £1,177,500, and in a dividend tax £44,137 10s. This shows that £98 1s. 8d. per share has been paid in dividends.

URUGUAY.

GOLD FIELDS OF URUGUAY, LIMITED.—The mines of this company, near Toucarembo, yielded about £70,000 during 1891; 32,192 tons were milled, yielding an average of \$2.12 per ton. The expenses amounted to \$2.56 a ton.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Feb. 26.

Heavy Chemicals.—This market continues dull, although manufacturers report an improved demand. Prices are firmer, and it is probable that there will be more activity within a short time.

Caustic Soda.—Some activity has been manifested in this article. Quotations are: 60% 3c.; 70-74% 2-85c.; 77% 2-87½c.

Carbonated Soda Ash.—The position of carbonated ash does not show much change. It continues firm, with light spot supplies, and an upward tendency as to prices. We quote: B. M. & Co. 48%, 1-60@1-62½c.; 58% 1-50c.

Alkali.—Stocks here continue light. There has been some demand for spot goods, but in many cases consumers have been unable to secure them. A fair business for future delivery has been done. We quote: 48%, B. M. & Co., 1-60c.; 58%, 1-47½@1-50c.

Bleaching Powder.—A steady business has been done during the week. The agents' price for bleach remains fixed at 2-15c.

Sul Soda.—The English article shows a decline in price, due principally to the low figures at which the domestic article has been sold. We quote this week: English, 1-07½c.; domestic, 85@90c., with discounts and concessions which in some cases make the actual price fall below these figures.

Acids.—A fair business is doing in the various acids, and manufacturers are looking forward to next month for a greater activity. A prosperous year is predicted by well-informed persons. One of the largest manufacturers in this country stated that he considered the outlook exceedingly promising, owing to the fact that the consumption for 1892 probably would be in excess of that for 1891 while the productive capacity of the acid plants about here had decreased. We quote this week for 100 lbs. of acid in New York in lots of 50 carboys or more: Acetic, \$1.00@\$.92, according to quality; alum, lump, or ground, \$1.55@\$.80; muriatic, 18", \$1; 20", \$1.12½@\$.1.25; 22", \$1.25; nitric, 40", \$4; 42", \$4.50@\$.4.75; sulphuric, 90c@\$.1.10; oxalic, \$7.25@\$.7.75. Blue vitriol is quoted all the way from \$3.25@\$.3.50, with rumors of some sales at \$3.

Brimstone.—Owing to the absence of demand this market continues dull and weak, and with a declining tendency, which will help to keep buyers out of the market in expectation of still lower prices. Quotations are as follows: On the spot, best unmixed seconds, \$28; to arrive, near due, seconds, \$27; February-March shipments, best unmixed seconds, \$25.50; best unmixed thirds, \$24 25.

Fertilizers.—There has been a slightly better demand for some of the various fertilizing chemicals, although, on the whole, the market continues quiet. We quote this week: Sulphate of

ammonia, 2-95@3c. for spot. Dried blood, \$1.95 per unit for high grade and \$1.85 for low grade. Acidulated fish scrap, \$13.50 f. o. b. factory. Dried scrap, \$23.50@\$.24. Azotine, \$1.95. Tankage, \$19 @\$.21. Bone meal, \$22@\$.23.

Double Manure Salts.—Quotations are about as follows for winter shipments, ex-vessel New York, in lots of 10 to 50 tons: 48%, 53%, 1-18½@1-23½c.; 90-95%, 2-18@2-23½c.; 96-99%, 2-21@2-23½c.

Kaimit.—There is no business doing in this article. Quotations remain \$8.75@\$.9.50, according to quantity, time of delivery, &c.

Muriate of Potash.—Only a small jobbing demand is reported. Prices remain as fixed by the syndicate.

Phosphates.—Nothing of interest can be reported so far as the local market is concerned. Prices continue at \$6 for dried and \$5 for undried, with freights at \$1.75@\$.2.

From Messrs. Couper, Millar & Co.'s latest report on the fertilizer market of the United Kingdom we extract the following: "There is not much alteration to report in the state of the fertilizer trade since our last issue. Cheap offers of Florida phosphates continue to be circulated on all sides, and until this overabundance ceases, it is impossible for a better feeling to prevail. We have reason to believe that many of these offers are made with a view to "bearing" the market, and the same disposition is noticeable with regard to sellers in Paris. On the other hand the actual production of high testing rock in Florida has fallen off very considerably and therefore only a few mines in active operation. In the river district of South Carolina several dredges have ceased working, and in the Somme (France) and Liège (Belgium) centres the workings are being conducted but slowly. The open winter will probably have the effect of increasing orders for manufactured fertilizers for spring delivery and thus help manufacturers to get rid of their stocks, which have been unprecedentedly heavy. Mineral Phosphates.—The quantity of first class Canadian available for this season's shipment is much smaller than usual, and we shall be glad to receive offers, as sellers do not seem inclined to take the initiative. Florida 75% rock has been sold at 8½d., and there are now offers in the market at this price. River pebble is quoted at 9d., but the quantities available for early delivery are small, and all the Florida raisers are making a joint combination. South Carolina river and land rock are quoted at 9d. Ground Somme phosphate is being sold at prices equivalent to 11½d. and 10½d. c. i. f. London, for 75% and 70% qualities respectively. Ground Osso and Belgian remain steady at former prices. Bedford coprolites we quote 2s. and Cambridge 44s. per ton, free on rails.

Nitrate of Soda.—The market for nitrate is quiet and dull. Quotations are: Spot, \$1.85@\$.1.87½, to arrive \$1.75.

NOTES OF THE WEEK.

The directors of Brunner, Mond & Company, of England, recommend a dividend at the rate of 50% per annum for the past year. Since 1884 the dividend has risen from 20% per annum to 50%.

From advices received as to the shipments to the end of January, and stocks at ports of discharge in Europe, the Permanent Nitrate Committee calculates that if the consumption of nitrate of soda in Europe, in the present season be only equal to that of last season, the stocks available at 31st May will be 4,000 tons, as against 160,000 tons at the corresponding period of 1891.

Liverpool.

Feb. 17.

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

The only article that seems to attract any attention at the moment is chlorate of potash, which is in a very peculiar position at present. The syndicate has withdrawn from the market altogether this week, and declines to give any quotations at the moment for either prompt or forward delivery. There are one or two odd resale parcels to be had at about 5½@5½d. per lb. less 5%, but second hand lots are extremely scarce. It is thought that the Syndicate will shortly announce an advance to 6d. per lb.

Soda Ash.—In fair request for prime brands for which high prices have to be paid. The common descriptions are quoted as follows: Caustic ash, 48%, £5 6s. 3d. per ton; 57% and 58%, £6 7s. 6d. per ton; carbonate ash, 48%, £5 9s. 9d. per ton; 58%, £6 12s. 9d. per ton; ammonia, 58%, £6 7s. 6d. per ton; all net cash. For special makes a considerable premium over above figures has to be paid.

Soda Crystals.—In spite of the large reduction on the Tyne, to which we referred in our last issue, the price in this district has only been reduced to the extent of 2s. 6d. per ton, and lowest figure here is £3 10s. per ton less 5%, with a fair amount of business reported at this price.

Caustic soda is quite neglected, but at the same time prices are without change as follows:

60%, £9 2s. 6d. per ton; 70%, £10 5s. per ton; 74%, £11 5s. per ton; 76%, £12 5s. @ £12 10s. per ton; all net cash. For parcels under 10 tons, 5s. per ton extra is charged.

Bleaching powder is scarce at £7 15s. @ £8 per ton net cash for hardwood packages, but nothing offering on this market for the States or Canada.

Bicarb. soda in fair demand at £6 15s. to £7 per ton less 2½% for one cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia eased off a little toward the close of last week, but has recovered again

and the tone is, if anything, rather firmer. On the spot we quote #10 10s. to #10 12s. 6d., for good grey 24%, and #10 15s. to #10 17s. 6d. for 25%, both in double bags less 2 1/2% f. o. b. here.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Deadwood, Dak., Pittsburg, St. Louis, London and Paris. see pages 268 and 270.]

NEW YORK, Friday Evening, Feb. 26.

The mining market during the past week has been dull and featureless. The sales have been small, and prices show, generally, a slight decline from last week's figures.

Mr. H. R. Lounsbury, treasurer of the Brunswick Consolidated Gold Mining Company, has prepared, for the interest of the stockholders, the following statement, based upon the letters and telegrams of the superintendent for the last three weeks: "The importance of the strike in the main shaft in the Brunswick mine, of Grass Valley, Cal., is understood by very few people or stockholders of the company. In the interest of honest mining, a few facts should be stated. The most important mine of the district, the famous Idaho, is only 1,000 ft. distant from the end lines of the Brunswick. The possibilities of the Brunswick are indicated by the recent strike of the ore vein. When first struck a few weeks ago, the pay streak was only 1 in. on the footwall of the ledge, and in 15 ft. it has widened out to 8 in. According to the latest advices the pay streak has also come in on the hanging wall, showing 1 ft. of pay ore, or in less than 25 ft. of sinking the ledge shows a pay streak of 24 in. of free milling gold ore, averaging \$20 per ton." During the week the stock was sold at 11@13c. with total sales of 11,000 shares, according to the official lists of the Consolidated Stock and Petroleum Exchange. Belmont shows sales of 1,000 shares at 60c.

The Comstocks, with few exceptions, have been neglected during the week, and have been sold at lower prices. Among other transactions we note sales of 100 shares of Alpha at 60c.; 100 shares of Alta at \$1.20; 100 shares Andes, 95c.; 500 shares Best & Belcher at \$2.30@2.70, the first price obtained at the close; 700 shares of Comstock Tunnel stock at 16@17c.; 100 shares of Julia at 20c.; 1,500 shares of Consolidated Imperial at 15c.; 100 shares of Overman at \$1.65; 250 shares of Potosi at \$1.25@1.60; 200 shares of Scorpion at 30c.; 100 shares of Segregated Belcher at 93c.; 320 shares of Union Consolidated at \$1.45@1.60; 1,000 shares Utah, 35@45c.; 420 shares Crown Point at \$1.10 @ \$1.15; 650 shares Gould & Curry at \$1.40@1.60; 150 shares of Hale & Norcross at \$2.15@2.20; 400 shares of Ophir at \$2.75@3; 100 shares of Savage at \$1.25; 400 shares of Sierra Nevada at \$1.45@1.55; 100 shares of Yellow Jacket at 80c.; 700 shares of Mexican at \$1.75@2.

There are inquiries in Boston financial circles for both Quincy and Tamarack, Jr., stock, securities not listed on the exchange of that city. The former was bid at \$107 1/2 and is held at \$111; 75 shares were traded in between these figures. Tamarack, Jr., sold a limited number of shares at \$44 1/2, which figure was bid a second time without bringing out any more stock.

Among the Colorado stocks Leadville Consolidated continues to lead in popularity. During the week there were sold 2,100 shares at 23c. to 24c. There was a sale of 50 shares of Little Chief at 25c. Robinson Consolidated appeared in some demand. The price opened at 54c. and declined to 45c. Adams shows transactions of 300 shares at \$1.25.

Phenix of Arizona this week was dealt in to the extent of 1,700 shares at 50@56c.

Among the Black Hills stocks there were sales of 650 shares of Caledonia at \$2@2.85c., and a single transaction of 100 shares of Deadwood Terra at \$2.05.

Boston. Feb. 25.

(From our Special Correspondent.)

The past week has been an extremely dull one in copper stocks, and the outlook is not very encouraging. Prices on the whole have been fairly well maintained, but there is no disposition to operate to any extent, and were it not for the support of the short interest the market would go much lower. There are but few of the companies which can produce copper and make money at the present low rates for ingot, and these few are strongly held for investment. The only stock outside of the dividend payers which has shown any activity is Centennial. This stock has been largely oversold and the demand for it from shorts carried it up to \$8 1/2@8 3/4.

Franklin came out freely to-day, a sale of 800 shares carrying the price down to \$11, a loss of \$1 from last week. Kearsarge sold at \$10 1/2, a decline of 1/2. Small lots of Osceola sold at \$25, and 10 shares only of Tamarack at \$150, a gain of \$2. Calumet & Hecla sold ex-dividend \$5 at \$254 and advanced to \$255. Boston & Montana was quite steady at \$32 1/2@33, and Butte & Boston was heavy and declined to \$14.

Allouez sold at \$1 1/2, and Atlantic at \$9 for 50 shares.

3 P. M.—There was rather more activity this afternoon under the lead of Boston & Montana, which came out freely at \$33, with closing sales at \$32 1/2. Butte & Boston sold at \$14, and Centennial declined to \$8. There is nothing doing in silver stocks.

BOSTON, Feb. 26.—By Telegraph—The market was dull to-day. Boston & Montana, \$32 1/2; Butte & Boston, \$13 1/2; Centennial, \$8 1/2; Kearsarge, \$10 1/2; Calumet & Hecla, \$20.

San Francisco. Feb. 19.

(From our Special Correspondent.)

The following stocks have been dropped from the list of the San Francisco Exchange for non-payment of the annual dues: Argenta, Central, Con. Pacific, Diana, Found Treasure, West Comstock, West Potosi and North Utah. This is satisfactory, but the list will bear considerably more weeding out of "wild-cats" before it will be a perfectly satisfactory one.

Prices during the week have tended downward and to-day the weakening tendency continued. Hale & Norcross has continued to attract most attention, and the sales have been fairly large and will probably continue so until election day. During call to-day over 2,000 shares at \$2.05@2.10, and nearly double that amount in the informal sessions.

The decline in the value of ore from Consolidated California & Virginia has explained to some extent the weakness of the north end Comstocks. The leader sold to-day for \$4.55, a decline of 81 cents on the week's trading. Ophir sold freely at \$2.90 and Mexican was steady at \$1.80; Scorpion at 20c. and Sierra Nevada at \$1.50.

In the middle groups of Comstocks, with the exception noted, stocks have not been firm. Chollar at \$1.65, and Savage at \$1.25 met with ready sales, but Best & Belcher at \$2.45; Gould & Curry at \$1.35; and Potosi at \$1.55 were heavy, the sales being light.

Some large sales have been made of the cheaper Gold Hill and South End stocks. Alpha ruled to-day at 40c.; Alta, 95c.; Bullion, 95c., and Confidence, \$2.50; 2,250 shares of Imperial sold in the afternoon regular session for 5c., and 1,200 Exchequer for 20c.; Justice was quoted at 45c.; Ventuck, 15c.; Lady Washington, 25c.; Occidental, 40c.; Overman, 65c., and Yellow Jacket, 80c.

Scattering sales have been made of outside stocks, but the sales have not been large. Bodie sold this morning at 55 cents; Commonwealth for 15 cents; Grand Prize, 10 cents; Mono, 95 cents; Peer, 5 cents; Peerless, 5 cents and Silver King, 35 cents.

SAN FRANCISCO, Friday, February 26th (By Telegraph).—To-day's opening quotations are somewhat lower than those last reported. They are as follows: Best & Belcher, \$2.20; Bodie, 45c.; Belle Isle, 25c.; Bulwer, 40c.; Chollar, \$1.15; Consolidated California & Virginia, \$4.45; Eureka Consolidated, \$1.50; Gould & Curry, \$1.35; Hale & Norcross, \$1.45; Mexican, \$1.75; Mono, 75c.; North Belle Isle, 15c.; Navajo, 5c.; Ophir, \$2.80; Savage, \$1.05; Sierra Nevada, \$1.30; Union Consolidated, \$1.45; Yellow Jacket, 75c.

MEETINGS.

Amy & Silversmith Consolidated Mining Company, at the office of the company, No. 29 West Broadway, Butte, Mont., March 16th, at 4 P. M.

Hale and Norcross Silver Mining Company, at the office of the company, room 53, Nevada Block, No. 309 Montgomery street, San Francisco, Cal., March 9th, at 1 P. M.

Indian Creek Land and Mining Company, at the office of the company, room 27, No. 419 California street, San Francisco, Cal., March 5th at 1 P. M.

Lackawanna Iron and Steel Company, at the office of the company, in the city of Scranton, Pa., March 2d, at 2 P. M.

Sloss Iron and Steel Company, at the office of the company, in Birmingham, Ala., March 16th, at 12 o'clock noon.

DIVIDENDS.

American Coal Company, dividend of three per cent., \$45,000, payable March 10th at the office of the company, No. 1 Broadway, New York City. Transfer books close February 29th and reopen March 11th.

Mollie Gibson Consolidated Mining and Milling Company, dividend No. 20, of 15c. per share, \$150,000, payable March 15 at the office of the company in Colorado Springs, Colo. Transfer books close March 8th and reopen March 16th.

PIPE LINE CERTIFICATES.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales
Feb. 20.....	60%	60%	60%	60%	5,000
22.....	59%	59%	59%	59%	6,000
23.....	59%	59%	59%	59%	35,000
24.....	59%	59%	59%	59%	70,000
25.....	58%	58%	58%	58%	7,000
26.....	58%	58%	58%	58%	123,000

NEW YORK STOCK EXCHANGE.

	Opening.	Highest.	Lowest.	Closing.	Sales
Feb. 20.....
22.....
23.....
24.....
25.....	57%	57%	57%	57%	10,000
26.....

Total sales in barrels..... 10,000

ASSESSMENTS.

COMPANY.	No.	When levied.	D't'nt' in office.	Day of sale.	Amt. per share.
Alki Cons., Cal.....	2	Jan. 16	Feb. 20	Mar. 9	.02
Alta, Nev.....	41	Jan. 5	Feb. 9	Feb. 29	.10
Blue Jay, Utah.....	1	Jan. 18	Feb. 15	Mar. 7	.00 1/2
Bullion, S. Dak.....	8	Jan. 20	Feb. 20	Mar. 8	.03
Butte Queen, Cal.....	2	Jan. 26	Feb. 27	Mar. 18	.04
Challenge, Con. Nev.....	10	Jan. 14	Feb. 17	Mar. 9	.25
Chollar, Nev.....	32	Jan. 8	Feb. 11	Mar. 3	.50
Con. Imperial, Nev.....	32	Jan. 22	Feb. 25	Mar. 15	.25
Con vention G., S. Dak.....	1	Jan. 16	Feb. 20	.....	.001
Evening Star, Cal.....	3	Jan. 20	Feb. 22	Mar. 12	.00 1/2
Exchequer, Nev.....	32	Jan. 22	Feb. 25	Mar. 17	.25
Found Treasure, Nev.....	7	Jan. 19	Feb. 24	Mar. 17	.50
Gen. Merritt, S. Dak.....	4	Jan. 2	Feb. 8	Feb. 29	.00 1/2
Golden Fleece	16	Jan. 30	Mar. 24	May 7	5.00
Gravel, Cal.....	63	Jan. 5	Feb. 8	Mar. 1	.30
Gould & Curry, Nev.....	1	Jan. 11	Feb. 15	Mar. 7	.02
Guasacaran & California, B. C.....	6	Feb. 9	Mar. 15	Apr. 5	3.00
Imperial, Nev.....	33	Jan. 23	Feb. 25	Mar. 15	.03
Keystone, S. Dak.....	1	Jan. 16	Feb. 16	Mar. 2	10.00
Martin White, Nev.....	27	Jan. 8	Feb. 11	Mar. 12	.25
Mexican, Nev.....	44	Jan. 14	Feb. 17	Mar. 10	.25
Middle Creek Gold, B. Col.....	2	Jan. 16	Feb. 20	Mar. 22	.05
Modoc Chief, Idaho.....	1	Jan. 28	Mar. 21	Apr. 11	.02 1/2
Northwestern G. & S. B. Col.....	4	Jan. 15	Feb. 24	Mar. 16	.25
Norway, Utah.....	9	Dec. 24	Feb. 1	July 21	.02
Occidental Con., Nev.....	9	Jan. 11	Feb. 16	Mar. 10	.25
Overman, Nev.....	63	Feb. 10	Mar. 16	Apr. 6	.50
Pasadena, Utah.....	1	Jan. 12	Feb. 15	Mar. 10	.00 1/2
Pin Hill.....	1	Feb. 11	Mar. 24	Apr. 15	.04
San Francisco M. & M. Cal.....	1	Jan. 12	Feb. 16	Mar. 8	.02
Savage, Nev.....	78	Feb. 2	Mar. 8	Mar. 28	.50
Sierra Nev., S. Nev.....	101	Feb. 1	Mar. 4	Mar. 24	.30
Terikoff Gold, Cal.....	7	Jan. 2	Feb. 2	Feb. 29	.01
Union Con., Nev.....	45	Jan. 6	Feb. 11	Mar. 2	.25
Weldon, Ariz.....	5	Feb. 9	Mar. 15	Apr. 14	.05
Yellow Jacket, Nev.....	2	Feb. 2	Mar. 4	Apr. 2	.50

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 26
PRODUCTION OF BITUMINOUS COAL for week ending February 20th, and year from January 1st.

	1892.		1891.
	Week.	Year.	Year.
Phila. & Erie R. R.....	1,384	11,652	24,777
Cumberland, Md.....	60,939	442,542	529,272
Barclay, Pa.....	11,027	32,713	23,570
Broad Top, Pa.....	12,912	84,760	96,226
Clearfield, Pa.....	52,830	508,032	658,633
Allegheny, Pa.....	19,654	157,532	190,165
Beach Creek, Pa.....	147,271	331,659	356,875
Pocahontas Flat Top.....	55,906	358,930	312,280
Nashwa, W. Va.....	54,819	325,588	286,505
Total.....	309,242	2,251,408	2,478,308

WESTERN SHIPMENTS.

	1892.		1891.
	Week.	Year.	Year.
Pittsburg, Pa.....	25,893	193,624	162,541
Westmoreland, Pa.....	47,134	260,690	292,576
Monongahela, Pa.....	7,884	66,212	82,115
Total.....	80,911	520,526	537,272

Grand total..... 390,153 2,771,934 3,015,575
*Week ending February 14th.
†Estimated.

PRODUCTION OF COKE on line of Pennsylvania R. R. for the year ending February 20th, 1892, and year from January 1st, in tons of 2,000 lbs.: Week, 115,412 tons; year, 840,598 tons; to corresponding date in 1891, 804,691 tons.

Statement of shipments of anthracite coal for month of January, 1892, compared with the corresponding period last year. Compiled from the returns furnished by mine operators:

Regions.	January, 1892.	January, 1891.	Difference.
Wyoming Region	Tons. 1,520,927.06	Tons. 1,684,307.05	D. 163,379.19
Lehigh Region.	353,347.00	499,421.12	D. 146,074.12
Schuylkill Region.	935,592.04	955,282.07	D. 19,690.03
Total.....	2,809,866.10	3,138,961.04	D. 319,094.14

The stock of coal on hand at tide-water shipping points, January 31st, 1892, was 790,932 tons; on December 31st, 1891, 637,668 tons; increase, 153,264 tons.

Anthracite.

The Anthracite coal trade this week was again excited by the news that steps were being taken by the Philadelphia & Reading consolidated interests to obtain control of the production of the independent operators.

We learn the following facts from Mr. E. B. Ely, of Coxe Bros. & Co., the prime mover among the independent interests.

A proposition is made to handle the coal originating on the Lehigh Valley and Jersey Central lines on the following basis:

At \$4 per ton or less, the operator to get 60% and railroad 40%. On all over \$4 and less than \$4.50 per ton the operator to get 40% and the railroad 60%. All over \$4.50 per ton the operator to get 30% and the

railroad 70%. This permits of the following schedule,

Price.	Operator.	Railroad.
\$4.00	\$2.40	\$1.60
4.10	2.44	1.66
4.25	2.50	1.75
4.35	2.54	1.79
4.50	2.60	1.90
4.60	2.63	1.97
4.75	2.67½	2.07½
4.85	2.70½	2.14½
5.00	2.75	2.25

President McLeod virtually guarantees the minimum price on stove coal at \$4 f. o. b., New York harbor. He stipulates that such price be based on the average monthly prices of Wyoming coals of the Lehigh Valley and Delaware, Lackawanna & Western. He offers as an additional inducement the establishment of the board of arbitration for the settlement of all possible disputes, and of a system for inspection of coals.

Although no article or contracts have been drawn up, about 20 of the largest operators, among whom is Coxe Bros. & Co., have signified their intention of accepting the proposition. So far as can be learned no move of this kind has been made by the Delaware, Lackawanna & Western road, although one is expected. If consummated this movement will place within the combination a very large percentage of the independent operators, representing 10% of the entire trade, and these usually cause most of the rate cutting. With this element of weakness removed from the market, the companies outside of the combination appear to be the only sources of trouble to the new combination. Of course, whatever the Pennsylvania courts may decide as to the legality or otherwise of the combination, some way of bringing all the roads under one policy can be devised.

The policy of the Philadelphia & Reading Consolidation continues conservative. Leading coal officials in touch with the management state that they have learned nothing concerning the plans or policy of the company with respect to the coal trade, and it is fair to presume that none have been announced. One fact seems to have gained general credence, viz, that for the present there will be no change in prices. When we consider that in addition, production is very rigidly restricted—during January it exceeded the allotment but 300,000 tons, and it will make even a better showing this month, the stability of the market of the immediate future is assured. Public opinion just at this time would make it unwise to consider an advance in the circular.

Already the retailer is inquiring as to the basis on which he can contract for his coal for the year's trade. So general has this become that it reflects a decided mistrust and uncertainty.

From the facts given above relative to the terms offered the independent operator, it would seem that it was the intention of the combination to make the minimum price of stove coal f. o. b. \$4. If this be the case the retailer need have no hesitancy in purchasing at the present circular.

In trade circles the demand is reported limited, at about circular prices. Stocks in retailers' hands are light, and there seems to be no inclination to increase them.

The sales agents' meeting held this afternoon was a cut and dried affair. The different companies were represented as they have been in the past. It required five minutes to fix the March output at 2,500,000 tons for all interests. There was no change in prices.

The coal stock market during the week under review has been active, and controlled largely by speculative movements. Prices fluctuated considerably, showing a downward tendency. The bears have been in control, and in manipulating the market have used news of gold exports and rumors of interference in the coal combination by State officials. The large number of realization orders made their work the easier. Yesterday the news of the arrangement between the Philadelphia & Reading and the independent operators, as reported in our coal trade review, brought most of the stocks up a point—ground which was soon lost by the incessant hammering of the bears.

Philadelphia & Reading continues exceedingly active, selling 255,361 shares on the New York Stock Exchange, and 106,891 shares on the Philadelphia Exchange in four days. The highest point reached was \$59½ last Saturday, as against \$57½@58½ yesterday. Jersey Central from an opening at \$137½@138½, touched \$139½ on Tuesday, closing at \$137½ yesterday, after having reached \$139 on the same day. Lehigh Valley Railroad, transactions on the Philadelphia Exchange, opened on Saturday at \$59½, closing yesterday at \$57½@58.

Delaware, Lackawanna & Western was the strongest on the list, owing, it is said, to its closer amalgamation with the combine by the election of Messrs. Maxwell and Baker to the directorate, and it sold as high as \$160½ on Tuesday, a gain of four points from the opening of Saturday, and closed yesterday very firm at \$153½ @ \$150½. Delaware & Hudson Canal lost ground during the entire week, a fact attributed to the figures of the annual report, recently issued. It opened at \$34½ Saturday, and closed yesterday at \$31½ @ \$22.

Bituminous.

The bituminous coal trade is filling in the prevailing dull period by a consideration of conditions likely to influence the course of the market during the ensuing coal year. The Seaboard Steam Coal

Association is receiving much of this attention. That there will be operative such an organization during the year is generally conceded. There are also many who believe that it will be hedged about by conditions which will make it of a not-to-be-violated nature. Those of the companies who have nearly lived up to their agreements during the past year look to the railroads for support. While they do not for a moment expect them to take any action that will lessen the volume of tonnage without a compensation, they claim that these corporations realize that it is to their advantage that rate cutting be reduced to the minimum.

A fertile source of this practice has been the frequent spasmodic accumulations of stock at tide-water, forcing holders to sell at a sacrifice of rates in order that their collieries might operate without interruption. The railroad companies have it in their power to regulate these stocks, and it is hinted that this will be one of the measures advocated. A number of years ago they made a practice of charging so much a day demurrage on delayed cars. The result was a strict regulation of the production to the demand.

The question of freight rates has not been given serious consideration. The producers say the present tariff is very high. Nevertheless the inherent proclivities of railroad corporations to demand the maximum give little ground for hope of better things this year.

In regard to trade conditions we repeat our report of last week. Old contracts are about supplied, the making of new ones a month distant, while the new trade is insignificant. Stocks at tide water are on the whole large.

Ocean freights are weak; 80@85c. rules from Philadelphia to Boston, and 70c. to Sound ports. From Baltimore 85c. rules to Boston, while from Norfolk 75c. is the quotation. Vessels are plenty at the latter port; at the others scarce and in some demand.

NOTES OF THE WEEK.

The Philadelphia & Reading management has decided to abolish the old style small coal cars. Large investments are to be made in the latest and most approved patterns of rolling stock to replace the old.

A Philadelphia, Pa., special to Dow, Jones & Co.'s news agency says: The anthracite coal miners do not support Powderly's effort to upset the coal deal. Their wages are based upon the selling price of coal and they believe the combination will raise the price, thus increasing their wages.

The Pennsylvania Railroad Company has 300 men working between Turtle Creek and Wilmerding for the purpose, it is said, of blockading the Beech Creek Railway which has been surveyed from Phillipsburgh to Bessemer. The Reading Company which is said to be backing the Beech Creek Railway, has another survey between Murraysville and Turtle Creek, to which it may revert.

The Pennsylvania Railroad Company is engaged in considerable work in the Lackawanna anthracite fields. Excavations are being made for a long bridge to cross the Susquehanna River at Wilkes-barre, which is thought to indicate the construction of a line to Boston via Scranton, shortening that route over 100 miles, as well as furnishing close connections for the West.

Attorney-General Hensel, of Pennsylvania, has written to President McLeod, of the Reading Railroad, Maxwell, of the New Jersey Central, and Wilbur, of the Lehigh Valley, that a hearing on the complaints of Messrs. Cassatt and Powderly in regard to the Reading leases will take place in Harrisburg on Thursday, March 3d. The Attorney General also calls for copies of the leases or agreements by which the Reading acquired control of the New Jersey Central and Lehigh Valley roads.

At the annual election of the Delaware, Lackawanna & Western Company held on the 23d inst., there were 334,000 shares, unanimously voted for the following ticket: President, Samuel Sloan; secretary, Fred F. Chambers; treasurer, Frederick H. Gibbons; managers, John I. Blair, George Bliss, Percy R. Pynch, Wilson G. Hunt, W. W. Astor, Edgar S. Auchincloss, William H. Appleton, William Rockefeller, Eugene Higgins, Henry A. C. Taylor, Benjamin G. Clarke, Andrew H. McClintock, J. Rogers Maxwell and George F. Baker. The last two managers take the place of Russell Sage and Sidney Dillon.

The Delaware & Hudson Canal Company on the 24th inst. declared the first quarterly dividend for 1892, 1½%, payable March 15th. A comparative summary of the profit and loss account of the Delaware & Hudson Canal Company for the year ending December 31st, shows:

	1891.	1890.
Total gross receipts.....	\$19,109,202	\$19,180,848
Expenses.....	13,511,776	13,101,176
Taxes and rentals.....	3,393,377	3,511,333
Net earnings.....	2,204,049	2,568,338
Equal to.....	7.34%	10.48%

The receipts from coal during the year 1891 amount to \$8,335,009, as against \$7,875,378 in 1890. The receipts from railroads amount to \$10,062,323 and miscellaneous receipts and interest, \$711,869.

Boston.

Feb. 21.

(From our Special Correspondent.)

The market is extremely quiet, so far as anthracite coal is concerned. Usually by this time of the year there is at least a moderate demand, but

the new turn affairs have lately taken among the companies is killing business for the present. When the combination of the coal interests is completed and the trade is assured of the fact, then retail dealers will make purchases, and not before. Notwithstanding the fact that the railroad companies are asking 15c. per ton more for their coal than they were a week ago, coal can be had at the same rate now as then. Holders of small lots at tidewater are the principal cutters. Though the retail dealers here are buying just sufficient for their needs, the companies will not take orders for future delivery longer than 30 days at the utmost.

We quote f. o. b. prices net at New York: Stove, \$3.75@3.90; egg, \$3.00@3.75; free broken, \$3.50@3.60; chestnut, \$3.25@3.40; Lykens Valley, broken, \$4.00; egg, \$5; stove, \$5.40; chestnut, \$4.35.

With respect to bituminous coal, the mills are commencing to talk contracts and the dealers are assuming a more busied appearance. It has been intimated that several contracts have already been closed, but the parties who are supposed to have closed are mum. The prices asked f. o. b. at shipping port are, \$2.50 Baltimore, and \$2.60 Philadelphia. In the course of one or two weeks reliable information in regard to new contracts may be obtainable.

Freight rates are a little higher. The cause is a smaller supply of vessels of light tonnage. Some vessels are going into the ice carrying trade while others of greater tonnage are going into the foreign carrying trade.

We quote: From New York to Boston 60@65c.; from Philadelphia to Boston 80@85c.; from Philadelphia to Portland, 80c.; to Bath, 95c.; to Providence, 70c.; from Baltimore to Boston, 85@90c.; Newport News to Boston, 75c.; Sound Points, 65c.

The retailers are not doing as good a business as a week ago. The weather has been extremely mild, and, of course, has had its usual effect on trade.

We quote: Stove, \$5.50; nut, \$5.50; egg, \$5.25; furnace, \$5.25; Franklin, \$6.75@7, all sizes; Lehigh egg, \$5.50; Lehigh furnace, \$5.50. Wharf prices are 50 cents less than the foregoing.

The receipts of coal at this port for the week ending February 20th were 30,902 of anthracite and 17,715 tons of bituminous, against 9,472 tons of anthracite and 7,685 tons of bituminous for the corresponding week last year. The total receipts thus far this year have been 208,193 tons of anthracite and 81,513 tons of bituminous, against 144,785 tons of anthracite and 145,743 tons of bituminous for the same time last year.

Buffalo.

Feb. 25.

(From our Special Correspondent.)

There are no specially new developments connected with combination of the anthracite coal interests. The press has made the public familiar with all the important features. A delegation of gentlemen from the Philadelphia Commercial Exchange is in this city inspecting our coal and other transportation facilities, especially in connection with the Lehigh Valley docks, trestles, etc. They are very favorably impressed with what they have seen of our commercial advantages, and indicate that they expect a large business to result between Buffalo and Philadelphia as a sequence to their visit and a knowledge of our location and other matters which they have obtained information upon.

There are no changes to report in the demand for anthracite coal or prices, supply etc.

Bituminous coal is quiet and a shade steadier. The yards are less crowded with loaded cars, indicative that consumption is eating up the surplus supply.

Coke is quiet and unchanged.

There has been a deal or transfer of land on our river front between the Pennsylvania Coal Company and the New York, Lake Erie & Western Railroad. There were five parcels; now only two, in fact, by the change. The Erie will immediately commence the construction of large freight sheds on its lot and the Pennsylvania people will enlarge their coal trestles and stocking yards on their property. Here is another evidence of our commercial growth!

Chicago.

Feb. 24.

(From our Special Correspondent.)

Most of the heavy operators still believe it is somewhat early yet to venture the expression of an opinion as to the probable effect of the recent coalition.

The market here is no better and no worse than it has been, so far as prices are concerned, and the shippers do not look for any material change either way for the remainder of this season. Your correspondent is advised that the price of hard coal is \$4.75 in the yards; per contra other large dealers here handling coal, which is claimed to be a better article, assert most positively that they are not selling at less than \$5 per ton. Trade is very dull, new business light and sales of any moment few. Retail trade is ordinarily fair, the damp, cold weather necessitating a good amount of furnace and stove heat. It is generally believed that stocks will be very light by end of April, and many docks will be clear of coal.

It would appear that there is an almost never-ending supply of soft coal, and there are nearly as many sellers in the market as there are buyers. Under this condition of things prices must and do suffer, and in some cases margins are entirely lost sight of in the desire to save demurrage charges.

Eastern coal shows nearly the same excess as the Illinois and Indiana varieties. Demand is fair for all steam sizes and grades, but is still greatly influenced by the weather. Indiana block is quoted by operators at \$2.35@2.40 on track, here, in quantity lots, and \$2.50 by single car.

Coke is in fair demand, and some improvement is noted for foundry grade during the past few days. In furnace coke all best grades are quickly absorbed, and there is now little surplus.

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; Youngbiogheny, \$3.25; Illinois block, \$1.90@2; Brazil block, \$2.50.

Pittsburg. Feb. 25.

(From our Special Correspondent.)

Coal.—The demand for coal for local use continues active with a supply fully up to the demand. Consumption is steadily increasing. A rise in the Ohio enabled the coal men to forward to Cincinnati, 978,000 bushels, and to Louisville, 3,920,000, a total of 4,898,000 bushels. This leaves the harbor practically bare of coal so far as shipping is concerned. Talk of a reduction of half a cent for mining is still going on; both sides refuse to be interviewed. The lower markets are all abundantly supplied with coal. Pittsburg coal is selling at Cincinnati at 6½@7½c. per bushel; Louisville, 7@8c.; New Orleans, wholesale at landing, 34@35c. per barrel, 2½ barrels making a ton of 2,000 lbs.

Coke.—The trade continues to move along steadily, showing scarcely any change in the Connells-ville regions. The big boom that was predicted to be on its way to the regions has so far failed to put in an appearance, making the future still uncertain. Few are disposed to express an opinion in regard to the future as a large number of iron furnaces are making preparations to blow out pretty soon.

The outlook just now is not very promising. There are about the same number of ovens in operation as at date of last report, but the average running time has been reduced; besides there is considerable coke stacked in the various yards of the 85 plants in the region, of which 41 made six days, 16 five days, 18 four days and seven remained idle. The week's shipments were 129,330 tons, or 7,185 cars, as against 7,265 cars for the preceding week; decrease, 80 cars. Shipments to points west of Pittsburg, 3,083 cars; east of Pittsburg, 1,632; to Pittsburg, 1,780; total, 7,185. Prices unchanged.

METAL MARKET.

NEW YORK, Friday Evening, Feb. 26, 1892.
Prices of Silver Per Ounce Troy.

Feb.	Sterling Exchange.	London, Pence.	N. Y. Cents.	Value of sil. in \$1.	Feb.	Sterling Exchange.	London, Pence.	N. Y. Cents.	Value of sil. in \$1.
20	4.88	41½	90¼	.698	24	4.88	41½	90½	.703
22	.....	41½	.....	.....	25	4.88	41½	90½	.702
23	4.88	41½	90½	.701	26	4.88	41½	90½	.699

*Holiday.

The market shows but little animation. Orders for silver from London, if filled, are followed by orders at lower prices. Buyers are acting cautiously. Reports about a so-called monetary conference are probably premature. Judging from the indifference shown on the Exchange to the subject we must wait for more tangible data before any conclusions can be arrived at as to the course of silver, which is still downward.

The United States Assay Office at New York reports the total receipts of silver for the week to be 82,000 ounces.

A London cablegram under date of February 25th says: "A dispatch to the Times from Calcutta says that an address presented to the Government by the Bengal Chamber of Commerce on the subject of exchange says it is impossible for men in business to have any confidence in the future value of the rupee. It adds that it is the belief of the members of the Chamber of Commerce that there is no complete remedy for the fluctuations in the rates of exchange, except by either the establishment by an international agreement of a system of free coinage of both gold and silver, at fixed rates, or the adoption of a gold standard by India."

"Failing these remedies, there is nothing in the future except the gradual demonetization of silver by one country after another, with violent and endless fluctuations in the relative values of gold and silver and a fall in the value of the rupee to an extent impossible to predict."

It is also intimated that the British Government is disposed to join in an international conference without, however, being bound by its conclusions.

The adoption by the chief commercial nations of a standard ratio between silver and gold, at which either metal will be received in exchange for the other, is the only practicable way in which the two can be kept in circulation together. Whether that ratio be 15½ to 1, as in the Latin Union, or 16 to 1 as here, or 20 or 22 or 25 to 1, which is now nearly

the production ratio, it is necessary that it should be adopted by the great commercial nations. A ratio of 20 to 1, which would be \$1.03 per oz. for pure silver seems a probable proportion.

The ENGINEERING AND MINING JOURNAL advocates an international agreement which, fixing and accepting a standard ratio, will give stability to the value of silver and enable the producers of the metal to work with some security, and the holders of silver coins to know the actual value of what they receive.

Government Silver Purchases.

Washington, D. C., February 26th, 1892 (By Telegraph).—The Treasury Department purchased today 100,000 ounces of silver at prices ranging from 908 to 9085 per ounce, fine.

Silver Bullion Certificates.

	H.	L.	Sales.
Feb. 20.....	90¾	90¾	50,000
Feb. 22.....	.....	.....	.....
Feb. 23.....	.....	.....	15,000
Feb. 24.....	91¼	91¼	20,000
Feb. 25.....	90¾	.....	25,000
Feb. 26.....	90¾	.....	10,000
Total sales.....	.....	.....	120,000

Domestic and Foreign Coin.

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

	Bid.	Asked.
Trade dollars.....	\$.72	\$.75
Mexican dollars.....	.70½	.71½
Peruvian soles and Ch. Iian pesos.....	.48	.50
English silver.....	4.83	.....
Five francs.....	.93	.95
Victoria sovereigns.....	4.86	4.90
Twenty francs.....	3.86	3.90
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.....	3.86	4.00
Fine silver bars.....	90¾	91¼

Copper.—We have not much to report. The market is stagnant and neither side is anxious to do business. Sales of Lake have been made at 10½c., but not much is to be had at that price, and in the main the producers are keeping back. For casting copper there has been quite a good demand all along and as smelters have given way in price somewhat, a rather large business has resulted, and we have to quote, according to brand and quality, 10½@10¾c. Arizona copper is still held above the market and in consequence no contracts have been made. On the whole, it may be said that there is a firm tone underlying the market, and it is the opinion of many in the trade that about bottom prices have been reached.

The London market has improved somewhat, and prices have gone up to £44 for spot, and £44 12s. 6d. for three months. The demand for refined sorts is reported to be rather slack, and the month of February does not appear to have realized the expectations held. It is reported that a large sale of Anaconda matte has been made for delivery over the whole of this year, and thus English smelters have had an opportunity of providing themselves quite freely with furnace material.

There is a rumor in the trade that the Calumet & Hecla Company has again sold heavily at about 10½ cents per pound. Estimates of the amount sold run up into the millions of pounds, and it could probably have sold much more at this price. There are not wanting those who say this company could have sold even its entire output at a higher price had it been willing to do so.

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

To Liverpool—	Copper Matte.	Lbs.	Value.
S. S. Confucius.....	4,014 bags.	481,200	\$25,000
" Nevada.....	3,722 bags.	401,000	28,500
Halley.....	1,080 bags.	124,630	8,500
Etruria.....	2,141 bags.	240,600	15,000
To Hamburg—	Copper.	Lbs.	Value.
S. S. Polynesia.....	22 casks.	90,000	\$9,000
To Havre—	Copper.	Lbs.	Value.
S. S. La Gasconne.....	520 pigs.	81,820	\$7,500
To Rotterdam—	Copper.	Lbs.	Value.
S. S. Obdam.....	226 casks.	282,000	\$29,225
".....	257 pigs.	67,256	6,500

Tin.—Hardly anything has been done in a speculative way. Prices remain depressed, but the demand from consumers has been somewhat better, and the deliveries, consequently, were good. We quote for spot, 19½c., and March, 19.95c., and April, 19.75c.

The London market has shown hardly any fluctuation.

Early in the week there was a somewhat better tendency, but this more or less disappeared, and we close for spot £89 5s. and for three months £89 10s.

Lead has been rather firm, and prices have advanced to 4½c. with very few sellers. It is evident that Western smelters experience rather a scarcity of ores on account of the shutting down of the Idaho district, and with the present good consumption, and there being hardly any stocks anywhere, the firmness is easily explained. Besides it must not be lost sight of that values are cheap. We quote 4½c.

The European market is quiet, but rather firm, and in London Spanish lead is quoted at £10 15s. and English at £10 17s. 6d.

St. Louis Lead Market.—The John Wabl Commission Company telegraphs us as follows: "Lead strong but only limited trading. Buyers, as a

rule, are unwilling to pay advanced rates asked by sellers. Closing prices are 3½c. bid, 4c. asked.

Spelter.—A better business than for weeks past has been done; it is true at rather low prices, but producers having now sold considerable, are generally asking for a little more money. We quote 4½@4¾c. New York.

The foreign market appears to be rather flat, and any orders presenting themselves are eagerly competed for. The price in London of good ordinaries is £21 5s. and for specials £21 10s.

Antimony is lifeless and rather pressed for sale. We quote Cookson's 14½@15c. L. X., 11¼@12c. nominally; and Hallett's 10¾@11c.

Quicksilver.—This market is quiet and featureless. Nothing of any consequence was done during the week. Prices are slightly higher. We quote: London, £7 7s.; New York, \$41.50.

IRON MARKET REVIEW.

New York, Friday Evening, Feb. 26.

The week under review has brought no change to the general iron market, which continues plunged in the dullness last reported. We hear of but little business in pig iron or steel rails. Merchant steel is in fair demand from some quarters, structural material is very quiet and in other franchises at best but a moderate business is being done.

American Pig Iron.—The demand for pig iron has been growing smaller and smaller for the past few weeks, and not a single large transaction is reported in this market. Prices are pretty much as last quoted. Both Northern and Southern furnaces have made efforts to dispose of their stocks by offering concessions in the way of lower prices, but it has not resulted in greater business. The consumer appears to believe that the market is in his favor just now—as, indeed, it is. Naturally, such a course on the part of some producers will tend to make values still more uncertain. The business is of the same nature as reported for over a month past—enough to meet current requirements and no more. From the South come reports to the effect that many of the companies have a great deal of iron in their yards, but of so poor a quality that nobody will buy it. It would thus seem that the outlook for some of the over-capitalized concerns is anything but bright. We continue to quote Northern, No. 1X, \$17@17.50; No. 2X, \$15.50@16; Southern, No. 1X, \$16@17; No. 2X, \$15@16.

Spiegeleisen and Ferromanganese.—Some sales of foreign spiegeleisen, 10@12%, are reported at \$23.50. In ferromanganese nothing is doing and the market for both is as dull as it can be. We quote 20% spiegeleisen, \$20.50@27; 80% ferromanganese \$62@63.

Steel Rails.—The mills are still awaiting the large orders from the railroads which everybody asserts must come before long. During the week, however, no sale of any consequence was reported and the rail market has been quiet and dull. We continue to quote \$30 f. o. b. mill and \$30.70 at tidewater.

Rail Fastenings.—This market in sympathy with steel rails is exceedingly dull. No sales whatever are reported this week. 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.—Manufacturers report a fair business in this market. Prices are unchanged. We therefore continue to quote: 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.—Prices are unchanged and a fair amount of business is doing. We quote ruling discounts as follows: Butt, black, 57½%; butt, galvanized, 47%; lap, black, 67%; lap, galvanized, 55%; boiler tubes, under 3 in. and over 6 in., 55%; 3 in. to 6 in., 60%.

Structural Material.—The market for all kinds of structural material is very dull just now. We hear of no sales of any magnitude. Our quotations are as follows: Beams, 2.30@2.50c.; angles, 1.90@2.10c.; sheared plates, 1.85@2c.; tees, 2.40@2.60c.; channels, 2.40@2.50c. Universal plates, 2.10c.; bridge plates, 2.10c. on dock.

Old Rails.—This market continues dull and featureless. No sales are reported. Nominal quotations are: Old tees, \$20@21; doubles, \$22@23. Wrought iron scrap is quoted at \$19@20.

NOTES OF THE WEEK.

The shipments of iron ore from Cleveland, O., to furnaces during the week ending the 19th inst. were 29,750 tons against 13,500 tons during the corresponding time in 1890.

The members of the hardware and metal trades held a dinner at Sherry's in this city, on the 23d inst., at which 400 were present. It was the first since 1860. Among the addresses were one by David Williams on "Hardware Dinners," ex-Mayor Hewitt on "The Iron and Steel Industries," Mayor Joseph B. Sargent, of New Haven, Conn., on "The Past and Present of Manufacture," and W. H. McElory, on "Subjective Hardware."

Chicago. Feb. 24.
(From our Special Correspondent.)

The past week or 10 days has witnessed no improvement in the iron trade, but rather a decreased demand for both crude and finished iron. There have been no transactions of any consequence in any line and the immediate outlook is discouraging to manufacturers. The fact that some consumers of pig iron are requesting furnaces to withhold shipments for a while, is evidence of dullness in certain branches of the foundry trade. Steel structural material is in good inquiry and several large contracts now being figured on are bringing out some low offers on beams and other shapes. All departments of the agricultural implement and kindred trades were never so actively employed as now, and mills which make a specialty of soft steels are fully employed, both here and east of us. Steel rails are in good demand, and the outlook is more promising than ever for further large orders. A rolling mill in this vicinity expects to start up early in March, which will afford dealers in old material and scrap an opportunity to get rid of some of their stock.

Pig Iron.—The market is unmistakably quiet, transactions are small, and in a general way prices are weaker. Northern coke irons are selling in small quantities only; anything over 300 tons is now considered a good order. Trade is very largely confined to carloads up to 50 tons, and as foundries are none too well supplied with work, this class of business may characterize the market for the next few weeks; several speculative lots have sold at a low price for cash. There is nothing in view at present, on which to base the hypothesis of an early improvement. We are now experiencing the usual anti-spring dullness, which is really all the more noticeable as so much better things had been expected. Some consumers moreover, are and have been for a week or two requesting furnaces to hold up on shipments for a while. Lake Superior charcoal iron is in much the same condition, orders are light and less firm than they have been. With exception of Nos. 1 and 2 soft sales of Southern iron in this market are few and far between, and the outlook unsatisfactory and discouraging to agents.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$17@17.50; Lake Superior coke, No. 1, \$15.00@16; No. 2, \$14.25@14.75; No. 3, \$14@14.50; Lake Superior Bessemer, \$17; Lake Superior Scotch, \$16@17.00; 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 silverles, 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.—Several large quantities of structural steel are exciting lively competition and low figures are being made on beams. There is plenty of work in sight and the outlook more promising than a year ago. Regular quotations are: Car lots f. o. b. Chicago are as follows: Angles, \$2@2.10; tees, \$2.20@2.30 universal plates, \$2.05@2.15; sheared plates, \$2.10@2.15; beams and channels, \$2.40@2.50.

Plates.—Business is quiet and prices weak, with no market on tubes. It is not now a question with agents and dealers of making money, but of making the least loss. 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, 2 1/4 in. and smaller, 55%; 7 in. and upward, 65%.

Merchant Steel.—New business is light, but from the nature of inquiry now in the market some large orders are expected in the near future. The outlook is excellent. Manufacturers and consumers are taking tool steel freely. 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, \$1.75@1.90; open hearth machinery, \$2.60@2.75; open hearth carriage spring, \$2.30@2.40; crucible spring, \$3.75@4.

Steel Rails.—Further developments in the Northwest show that a large tonnage of both heavy and light weight sections is yet to be placed. If the prospect continues as bright in this branch of the soft steel trade it may have the effect of stimulating prices in other steel material. Quotations are steady at \$31.50@33. Miscellaneous track material is in fair demand. Regular quotations are: 100@135c. for steel or iron; spikes at \$2.15@2.25 per 100 lbs.; track bolts, hexagonal nuts, \$2.65@2.70.

Galvanized Sheet Iron.—Mill orders and warehouse business are light, and discounts on the former are 70%, and from stock 67 1/4% off on Juniata and 67 1/2% and 5% on charcoal.

Black Sheet Iron.—Orders are infrequent, business very light and prices less firm. Quotations are easy at 2.85c. Chicago for No. 27 common. Jobbing price is 3.10c., same gauge from stock.

Bar Iron.—Demand as reported by different mill agents is very irregular; with some it is fair to indifferent, others say quiet to dull. Orders are few and mostly for small quantities, carloads to 50 or 100 tons, on which quotations are 1.65@1.67 1/2c. Jobbing trade continues fair at 1.75@1.85c., rates according to quality.

Nails.—Steel cut and wire nails are in light demand and the former a shade lower at \$1.60, regular specification from mill, and the latter now firm

at \$1.85. Jobbers quote \$1.70@1.75 for cut, and \$1.90 for wire nails.

Scrap.—Wrought grades are as flat as ever, but demand for inferior grades is moderately good and some movement is noted in miscellaneous steels. Most of the business is done at outside points. Quotations are still nominal. No. 1 railroad, \$18.50; No. 1 forge, \$18; No. 1 mill, \$13; fish plates, \$20.50; axles, \$22; horse-shoes, \$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.—Old iron rails are difficult to sell except at a sacrifice, and consumptive demand is light. In a nominal way they are quoted \$21.50. Old steel rails are quiet at \$13.50 for short and \$15.50 for selected lengths. Car wheels are dull at \$16@16.50.

Louisville. Feb. 20.
(Special Report by Hall Brothers & Co.)

The past week has been more noticeable for the low prices offered by some of the furnaces rather than for anything else. Even this has not resulted in much business, buyers feeling that if they can get these concessions on small lots they can do better by waiting. In fact some of the large consumers are stocked up with supplies for several months, and are unwilling to buy more now. This, with slack business with others, leaves a very quiet market for pig iron. We quote:

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

Forge Irons.—Neutral coke, \$12.50@12.75; cold short, \$12.25@12.50; mottled, \$11.50@11.75.

Car Wheel & Malleable Irons.—Southern (Standard brands), \$18@18.50; Southern (other brands), \$17.00@17.50; Lake Superior, \$19.50@20.50.

Philadelphia. Feb. 25.
(From our Special Correspondent.)

Pig Iron.—The one feature of the week is the continued sacrificing of Southern foundry irons in this and other markets, or, at least a selling of Southern irons at extremely low prices. The accumulation of iron may not reach a serious point, as spring trade will probably develop in time to save a break. The situation is disappointing. A few makers of Pennsylvania iron have offered special inducements this week, and as a result, considerable business has been done in both foundry and forge—foundry at \$17.50 and forge at \$14.50. Several companies refuse to yield, and will hold on at present quotations. Very little effort is being made by strong companies to sell at this time, the difficulty being that a reaction must set in soon, and that prices will harden. A few lots of American Scotch, cold and hot blast charcoal iron have been taken. Nothing whatever has been heard in regard to No. 2 and there are no inquiries on the market.

Muck Bars.—Very little business in muck bar has been done. Quotations continue low.

Steel Billets.—Inquiries were made yesterday for midsummer deliveries, but the parties who are willing to buy that far ahead are demanding very low quotations indeed; manufacturers will not yield. Several concerns will restrict output within a month unless prices or business improves. Large concerns are willing to keep on at present rates if business comes in, but not otherwise.

Merchant Iron.—A good deal of car building is going on, and demand for that purpose is fair, but all other requirements are very backward. A great deal of the iron sold is at 160c.; very little at 170c.

Nails.—There is no improvement in the nail market, despite the effort of manufacturers to work off stock. Several mills are shut down, and others are not running full.

Sheet Iron.—Something of an encouraging nature, it is anticipated, will result from the meeting held at Pittsburg. Business is very light in all kinds of sheet, but there are inquiries enough on the market to strengthen quotations in case buyers should make an effort to cover requirements. Card rates are adhered to on small lots.

Skelp Iron.—A few small transactions are reported in skelp.

Wrought Iron Pipe.—The only activity this week is reported in tubes; small lots of pipe are also going, but nothing to indicate an improvement.

Plate and Tank Iron.—Prices are being cut still further to secure a few orders on inquiries which appeared early this week. There is no doubt a good deal of material wanted, but it is impossible to say when business will be done in a large way. Tank plate has sold as low as 1.75c.; refined plates 2c. There is further sharp competition ahead.

Structural Material.—The only interest felt in this market is on beams, as there are inquiries out for several large lots, but buyers refuse to pay quoted rates; a further shading is quite probable. Sheared plates are 2c.; angles, 190c.

Steel Rails.—Steels rails are quoted at \$30 at mill, without any important feature to report.

Old Rails.—Old rails are quoted at \$20.50@21; old steel, \$16.50.

Scrap.—There is quite an urgent demand for scrap at present and the yards are rather empty. No. 1 Railroad is quoted at \$19.50; old car wheels, \$16.50.

Pittsburg. Feb. 25.
(From Our Special Correspondent.)

Prices continue weak and sales very materially restricted, and dealers, as a general thing, apart in their views. A movement is now on foot to close down a number of furnaces, and arrangements to that effect will be inaugurated in a very short time. Of course, there are quite a number of furnace men who have contracts not yet filled who will continue in operation until the metal contracted for is made.

We learn from reliable authority that Messrs. Richards, Matthews & Company will blow out five of their furnaces in the valley during the coming week; the furnaces that go out of operation will remain closed until the demand improves and prices show a material advance. The prevailing condition in the iron trade is one of dullness and depression. The volume of business is insufficient to keep the productive capacity employed, and the sharp competition that every order provokes keeps prices weak and irregular.

The confusion in the finished iron trade resulting from the collapse of the beam combination has not yet cleared away, and, while a large amount of structural material is required for work now under contract, a comparatively small business is being transacted in this line on account of the uncertain and indefinite condition of prices. It is largely the disproportion between the demand and supply that causes the low prices and gloomy feeling throughout the trade.

Notwithstanding the present unsatisfactory conditions, certain iron manufacturers have an astonishing degree of confidence in the future, for they still insist that this is to be the best year ever seen in the trade, although about two months of it have gone into history as an exceedingly unsatisfactory period. If these predictions of prosperity are to be fulfilled this year, the next ten months will necessarily be phenomenal.

Against this appears the cold facts of the present depressed condition of the trade. Southern iron is a disturbing factor at the present, and is pushing Northern iron in most of the leading markets. A well informed iron man says: "Everybody in the trade knows what the asking prices are, but there are very few who know surely what the lowest selling prices would be. Sellers may have their own individual ideas as to what they would do, but they are not certain what others might do, and therein lies the whole difficulty. Large consumers are equally unsettled in regard to their position; they admit that prices are low enough—too low in fact, but it is no funeral of theirs, and with the present outlook see no reason why they should step in until it appears to be their interest to do so."

Bessemer pig was more fancied this week than any other description; prices seem to have touched bottom; one large firm's purchases the last two weeks exceeds 20,000 tons; steel billets are very dull and prices normal.

The following sales are reported:

Coke Smelted Lake and Native Ores.

5,000 Tons Bessemer, City Furnace.....	\$15.00 cash.
5,000 Tons Bessemer, Valley Iron.....	15.00 cash.
2,000 Tons Bessemer.....	14.90 cash.
1,000 Tons Bessemer.....	14.85 cash.
500 Tons Grey Forge.....	13.50 cash.
500 Tons Grey Forge.....	13.50 cash.
500 Tons Bessemer.....	15.00 cash.
350 Tons Grey Forge.....	13.40 cash.
250 Tons No. 1 Foundry.....	15.75 cash.
200 Tons No. 2 Foundry.....	14.75 cash.
200 Tons No. 3 Foundry.....	14.00 cash.
200 Tons Mottled Iron.....	13.50 cash.
150 Tons No. 1 Silvery Extra.....	17.00 cash.

Charcoal.

290 Tons Southern Warm Blast.....	19.00 cash.
175 Tons Cold Blast.....	26.75 cash.
100 Tons Cold Blast.....	25.50 cash.
50 Tons Cold Blast.....	25.50 cash.
50 Tons No. 2 Foundry.....	20.50 cash.
50 Tons No. 1 Foundry.....	21.00 cash.

Steel Slabs and Billets.

5,000 Tons Rod Billets, March, April, May.....	23.20 cash.
2,000 Tons Steel Billets, April, May.....	23.25 cash.
1,000 Tons Steel Billets, April, May.....	23.00 cash.

Muck Bar.

500 Tons Neutral, March, April.....	25.50 cash.
300 Tons Neutral, March.....	25.50 cash.

Ferro-Manganese.

100 Tons 80%, imported.....	63.00 cash.
100 Tons 80%, domestic.....	63.00 cash.

Skelp Iron.

500 Tons Sheared Iron.....	1.85 4m.
400 Tons Narrow Grooved.....	1.57 1/2 4m.
300 Tons Wide Grooved.....	1.60 4m.

Steel Wire Rods.

500 Tons American Fives, April, at Mill.....	32.80 cash.
<i>Blooms, Beam, Rail and C. Ends.</i>	
1,000 Tons Rail and Bloom Ends.....	17.50 cash.
500 Tons Cup Ends.....	17.15 cash.

Old Iron and Steel Rails.

1,000 Tons Mixed Steel Rails.....	17.00 cash.
500 Tons Old Iron Rails.....	22.50 cash.
500 Tons Long Steel Rails.....	17.25 cash.

Scrap Material.

500 Tons No. 1 R. R. W. Scrap, net.....	20.00 cash.
200 Tons No. 1 R. R. W. Scrap, net.....	19.75 cash.
200 Tons Leaf Steel, gross.....	21.00 cash.
100 Tons Coil Steel, gross.....	19.00 cash.

NEW YORK MINING STOCKS QUOTATIONS.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

NAME AND LOCATION OF COMPANY.	Feb. 20.		Feb. 22.		Feb. 23.		Feb. 24.		Feb. 25.		Feb. 26.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams.....					1.25								300
Alice, Mont.....													
Amador.....													
Atlantic, Mich.....													
Belcher, Nev.....													
Belle Isle, Nev.....													
Bodie Cons., Cal.....													
Bos. & Mont., Mont.....													
Brecco, Colo.....													
Bulwer, Cal.....													
Caledonia, S. Dak.....	.83	.82			.88								650
Catalpa.....													
Chrysolite, Colo.....													
Colorado Central, Colo.....													
Commonwealth, Nev.....													
Comstock T. bonds, Nev.....											.28		1,000
Cons. Cal. & Va., Nev.....													
Crown Point, Nev.....	1.10				1.15	1.10			1.15				420
Daly.....													
Deadwood, Dak.....					2.05								100
Father de Smet, S. Dak.....													
Franklin, Mich.....													
Freeland, Colo.....													
Gould & Curry, Nev.....	1.50				1.45	1.40			1.60		1.45		650
Grand Prize.....													
Hale & Norcross, Nev.....	2.20				2.15								150
Homestake, Dak.....													
Horn-Silver, Utah.....													
Independence, Nev.....													
Iron Hill.....													
Iron Silver.....													
Leadville Cons., Colo.....						.23			.24	.23			2,100
Little Chief, Colo.....									.25				50
Martin White.....													
Mono.....													
Mt. Diablo, Nev.....													
Navajo, Nev.....													
N. Belle Isle, Nev.....													
Ontario, Utah.....													
Ophir, Nev.....	2.95					2.75			3.00		2.85		400
Overman.....													
Plymouth, Cal.....													
Quicksilver, Pref., Cal.....													
Quincy, Mich.....													
Robinson Cons., Colo.....									.45	.45	.46		4,800
Savage, Nev.....					1.25								100
Sierra Nevada, Nev.....	1.55					1.50			1.50		1.45		400
Silver Cord, Colo.....													
Silver King, Ariz.....													
Small Hopes.....													
Standard.....													
Stormont.....													
Yellow Jacket, Nev.....									.80				100

NAME AND LOCATION OF COMPANY.	Feb. 20.		Feb. 22.		Feb. 23.		Feb. 24.		Feb. 25.		Feb. 26.		SALES.	
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.		
Alpha.....	.60												100	
Alta.....	1.10												100	
American Flag, Colo.....	.95												100	
Andes, Cal.....														
Astoria, Cal.....														
Augusta, Ga.....														
bonds.....														
Barcelona, Nev.....														
Belmont, Cal.....											.60		1,000	
Best & Belcher, Nev.....	2.70				2.65			2.3		2.50		2.30	500	
Bonanza King, Cal.....														
Brunswick, Cal.....	.14	.12			.13	.12	.13	.11	.11		.12	.11	11,000	
Bullion, Nev.....														
Butte & Boston, Mont.....														
Castle Creek, Idaho.....														
Chollar.....														
Comstock T., Nev.....									.15		.16	.17	.16	700
Con. Imperial, Nev.....													1,500	
Con. Pacific, Cal.....														
Crescent, Colo.....														
Del Monte, Nev.....														
El Cristo, Rep. of Col.....														
Excelsior, Nev.....														
Exchequer, Nev.....														
Hollywood, Cal.....														
Julia.....	.20													
Justice.....														
King & Fenimore.....														
Lacrosse, Colo.....	.07	.06			.06				.05				2,400	
Lee Basin, Colo.....														
Mexican, Nev.....	2.90				1.90		1.76		2.00		1.75		700	
Middle Bar, Cal.....														
Monitor, Colo.....														
Mutual S. & M. Co., Wash.....														
Nevada Queen, Nev.....														
N. Standard, Cal.....														
N. Commonwealth, Nev.....														
Occidental, Nev.....														
Overman.....	1.65												100	
Phoenix Lead, Colo.....														
Phoenix of Ariz.....								.56		.50			1,700	
Potosi, Colo.....	1.60										1.25		250	
Rappahannock, Va.....														
S. Sebastian, S. Sal.....														
Santa Fe, N. M.....														
Scorpion, Nev.....									.30				200	
Seg. Belcher, Nev.....	.95												100	
Shoshone, Idaho.....														
Silver Queen.....														
Sullivan Cons., Dak.....														
Sutro Tunnel, Nev.....														
Syndicate.....														
Toronto, Nev.....								1.45		1.55			320	
Union Cons., Nev.....	1.60												1,000	
Utah, Nev.....	.45							.40	.35	.45		.40		

Ex-dividend. †Dealt at in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 11,220. Non-dividend shares sold, 21,870. Total shares sold, 33,090.

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Feb. 19.		Feb. 20.		Feb. 22.		Feb. 23.		Feb. 24.		Feb. 25.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Atlantic, Mich.....											9.00		50
Bodie, Cal.....													
Bonanza Development.....													
Bost. & Mont., Mont.....	33.00				33.00	32.50	33.50	32.75					857
Brecco, Colo.....					25	25	25						
Caltumet & Hecla, Mich.....	260	254											
Catalpa, Colo.....													
Central, Mich.....													
Cœur d'Alene, Id.....													
Con. Cal. & Va., Nev.....													
Dunkin, Colo.....													
Eureka, Nev.....													
Franklin, Mich.....	12.00							12.00	11.00				829
Honoring, Utah.....													
Horn Silver, Utah.....													
Kearsarge, Mich.....	10.50				10.13								
Lake Superior, Iron.....													
Little Pittsburg, Colo.....													
Minnesota Iron.....													
Napa, Cal.....													
Ontario, Utah.....													
Osceola, Mich.....					25.00	25.00	25.00						31
Quincy, Mich.....													
Ridge, Mich.....													
Sierra Nevada, Nev.....													
Silver King, Ariz.....													
Stormont, Utah.....													
Tamarack, Mich.....							150						10
Tecumseh, Mich.....													

NAME OF COMPANY.	Feb. 19.		Feb. 20.		Feb. 22.		Feb. 23.		Feb. 24.		Feb. 25.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Alhonz, Mich.....	1.13												110
Arnold, Mich.....													
Aztec, Mich.....													
Brunswick, Cal.....													
Butte & Boston, Mont.....	14.50	14.25	14.50	14.00			14.00	14.00	13.88	14.00			1,160
Centennial, Mich.....	7.50						8.00	7.25	8.25	7.88	8.50	8.00	1,370
Colchis.....													
Copper Falls, Mich.....													
Crescent, Colo.....													
Dana, Mich.....													
Don Enrique, N. M.....													
Geyser.....													
Hanover, Mich.....													
Humboldt, Mich.....													
Hungarian, Mich.....													
Huron, Mich.....													
Menard, Mich.....													

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table containing two columns: 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND PAYING MINES'. Each column lists mine names, locations, capital stock, shares, assessments, and dividends. The table is organized into two main sections with detailed sub-headers for each category.

G. Gold, S. Silver, L. Lead, C. Copper. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ‡ Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ¶ Previous to the consolidation in August, 1884, the California had paid \$3,320,000 in dividends, and the Con. Virginia 40,000,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$190,000 before re-organisation in 1890. ††† This company acquired the property of the Raymond & Ely Company which had paid \$3,075,000 in dividends.

STOCK MARKET QUOTATIONS

Aspen. Feb. 20. The closing quotations were as follows: Agnes C., Argentum Juniors, Aspen Deep Shaft, Aspen Contact, Best Friend, Bimetallie, Bushwacker, Carbonate Chief, Della S., Homer & Alta, Justice, Little Annie, Mollie Gibson, Nolan Creek, Park, Mamie & Queen, Pontiac, Sheep Mountain S. & M. Co., Smuggler, St. Joe & Mineral Farm, Yellow Boy.

Baltimore, Md. Feb. 25. COMPANY. Bid. Asked. Atlantic Coal, Balt. & N. C., Big Veln Coal, Conrad Hill, Cons. Coal, Diamond Tunnel, George's Creek Coal, Lake Chrome, Maryland & Charlotte, North State, Silver Valley.

Pittsburg, Pa. Prices highest and lowest for the week ending Feb. 24: COMPANY. H. L. Allegheny Gas Co., Bridgewater Gas Co., Chartiers Val. Gas, Columbia Oil Co., Consigne Mining Co., Consolidated Gas Co., East End Gas Co., Fisher Oil Co., Forest Oil Co., Hazlewood Oil Co., Hidalgo Mining Co., La Noria Mining Co., Luster Mining Co., Mansfield C. & C. Co., Manufacturers Gas Co., Nat. Gas Co. of W. Va., N. Y. & Clev. Gas Coal Co., Ohio Valley Gas Co., Pennsylvania Gas Co., People's Natural Gas Co., People's N. G. & P. Co., Philadelphia Co., Pine Run Gas Co., Pittsburg Gas Co., Red Cloud Mining Co., Silverton Mining Co., South Side Gas Co., Sterling Silver Mining Co., Tuna Oil Co., Union Gas Co., Washington Oil Co., W'moreland & Camb., Wheeling Gas Co., W'house E. Light, W'house Air Brake Co., W'house Brake Co., Ltd.

St. Louis. Feb. 24. CLOSING PRICES. Bid. Asked. Adams, Colo., American & Nettie, Colo., Bi-Metallic, Mont., Central Silver, Elizabeth, Mont., Granite Mountain, Mont., Hope, Little Albert, Montrose Placer, Colo., Mickey Breen, Pat Murphy, Colo., Small Hope, Colo., Silver Age, Silver Bell, Yuma, Ariz.

Helena, Mont. (Special report by SAMUEL K. DAVIS.) Prices highest and lowest for week ending Feb. 20, 1892: Bald Butte (Mont.), California (Castle), Mont., Champion (Oro Fino), Mont., Combination (Phillips'g), Mont., Copper Bell (Cataract), Mont., Cumberland (Castle), Mont., Elizabeth (Phillipsburg), Mont., Florence (Nelbart), Mont., Fourth of July, Wash., Glengary (Butte), Mont., Helena & Victor, Mont., Iron Mountain (Missoula), Mont., Iron Mountain Ext., Jersey Blue (Butte), Jumbo (Castle), Mont., Lone Pine Consolidated, Mac (Unionville), Mont., None Such (Unionville), Mont., Poorman (Coeur d'Alene), Idaho, Queen of the Hills (Nelbart), Southern Cross (Deer Lodge), Mont., Yellowstone (Castle), Mont.

Deadwood. Feb. 20. Bid. Asked. Bullion, Caledonia, Calumet, Cambrian, Carthage, Deadwood Terra, De Smet, Double Standard, Elk Mountain, Emmett, Equitable, Florence, Golden Reward, General Merritt, Harmony, Hester A., Homestake, Hermit, Iron Hill, Isadorah, Maggie, Monitor, Rainbow, Retriever, Ross-Hannibal, Ruby Bell, Ruby Wilkes, Seabury-Calkins, Silver Queen, Stewart, Tornado, Troy, Uncle Sam.

Trust Receipts. Sales at the New York Stock Exchange for week ending Feb. 26: American Cotton Oil, National Lead.

Trust Stocks. Special report by C. I. Hudson & Co., members New York Stock Exchange. The following are the closing quotations Feb. 26: CERTIFICATES. Am. Cotton Oil, Com., Am. Sugar Refineries, Com., Distillers' & Cattle Feeders, Lined Oil, National Cordage, Com., National Lead Co., Standard Oil, W. U. Beef Co.

Foreign Quotations. London. Feb. 12. Highest. Lowest. Amador, Cal., American Belle, Colo., Appalachian, N. C., Can. Phosphate, Can., Colorado, Cons. Esmeralda, Nev., De Lamar, Idaho, Dickens Guster, Idaho, East Arevale, Idaho, Elkhorn, Mont., Elmore, Idaho, Emma, Utah, Flagstaff, Utah, Garfield, Nev., Golden Feather, Golden Gate, Cal., Golden Leaf, Mont., Golden River, Cal., Jay Hawk, Mont., Josephine, Cal., Kohinoor, Colo., La Luz, Mex., La Plata, Colo., La Valera, Mex., Maid of Erin, Colo., Mammoth Gold, Ariz., Montana, Mont., New California, Colo., New Consolidated, New Eberhardt, Nev., New Gold Hill, N. C., New Guston, Colo., New Hoover Hill, N. C., New Russell, N. C., New Viola, Idaho, Old Lout, Colo., Parker Gold, N. C., Pittsburg Cons., Nev., Richmond Con., Nev., Ruby, Nev., Sam Christian, N. C., Sierra Buttes, Cal., Pumas Eur., Cal., United Mexican, Mex., U. S. Placer, Colo., West Argentine, Colo., Yankee Girl, Colo.

Paris. Feb. 11. Francs. East Oregon, Ore., Forest Hill Divide, Cal., Golden River, Cal., Laurium, Lexington, Mont., Nickel, Rio Tinto, Spain, Tharsis, Spain, Vieille-Montagne.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified. Acid-Acetic, No. 8, pure, 1,040, Commercial, in bbls. and cys. Carbonic, liquefied, Chromic, chem. pure, Hydrobromic, dilute, U. S. P., Hydrocyanic, U. S. P., Hydrofluoric, Alcohol-95%, Absolute, Ammoniated, Alum-Lump, Ground, Powdered, Alumina-Chloride-Pure, Amalgamating solution, Sulphate, Ammonia-Sul., Carbonate, Muriate, white, in bbls., Aqua Ammonia-(in cys) 18%, Antimony-Oxymur, Argolis-Red, powdered, Arsenic-White, powdered, Red, Yellow, White at Plymouth, Acetate-Cand., Italian, Ashes-Pot, 1st sorts, Pearl, Asphaltum-Prime Cuban, Hard Cuban, Trinidad, refined, Egyptian, Californian, at mine, at San Francisco, Barium-Carbonate, pure, Carbamate, commercial, Chlorate, crystal, Chloride, commercial, pure, Iodide, oz., Nitrate, powdered, Sulph., Am. prime white, Sulph., foreign, floated, Sulph., off. color, Carb., lump, f. o. b. L'pool, No. 1, Casks, Runcorn, No. 2, bags, Runcorn, Bauxite, ton, Bichromate of Potash-Scotch, American, Bichromate of Soda, Borax-Refined, San Francisco, Concentrated, in car lots, Refined, Liverpool, Bromine, Cadmium Minion, Cadmium Iodide, Chalk, precipitated, China Clay-English, Southern, Chrome Yellow, Chrome Iron Ore-Franisco, Chromalum-Pure, Commercial, Cobalt-Oxide, Copper-Sulph. English Wks. ton, Vitriol (blue), ordinary, extra, Nitrate, Copperas-Common, Best, Liverpool, Corundum-Powdered, Fluorspar-Powdered, No. 1, French Chalk-Fuller's Earth-Lump, Glauber's Salt-in bbls., Glass-Ground, Gold-Chloride, pure, crystals, pure, 15 gr. c.v., liquid, 15 gr. g. s. v., Chloride and sodium, Oxide, oz., Gypsum-Calcined, Land Plaster, Iodine-Resublimed, Iron-Nitrate, Kaolin-See China Clay, Kieselrite, Lead-Red, White, American, in oil, White, English, in oil, Acetate, or sugar of, white, Granulated, Nitrate, Lime Acetate-Am. Brown, Gray, Litharge-Powdered, English flake, Magnesite-Crude, tons, Calcined, ton of 1,015 kilos, Brick, ton of 1,015 kilos, Manganese-Ore, per unit, Oxide, ground, per lb., Mercuric Chloride-(Corrosive Sublimata)

Powdered, Marble Dust, Metallic Paint-Brown, Red, Mineral Wool-Ordinary slag, Ordinary rock, Ground, Mica-In sheets according to size, 1st quality, Naptha-Black, Nitre Cake, Oehre-Rochelle, Washed Nat Oxfrd, Lump, Washed Nat Oxfrd, Powder, Golden, Domestic, Oils, Mineral, Cylinder, light filtered, Dark filtered, Extra cold test, Dark steam refined, Phosphorus, Precip., red, white, Plumbago-Ceylon, American, Potassium-Cyanide, Bromide, domestic, Chlorate, English, Chlorate, powdered, English, Carbonate, Caustic, Iodide, Nitrate, refined, Bichromate, Yellow Prussiate, Red Prussiate, Pumice Stone-Select lumps, Original cks., Powdered, pure, Pyrites-Non-cupreous, p. units, Quartz-Ground, Rotten Stone-Powdered, Lump, Original cks., Rubbing stone, Sal Ammoniac-lump, in bbls., Salt-Liverpool, ground, Domestic, fine, Common, fine, Turk's Island, Salt peter-Crude, Soapstone-Sodium-Prussiate, Phosphate, Stannate, Tungstate, Hypsulphite, in casks, Strontium-Nitrate, Sulphur-Roll, Flour, Syvinite, 23% S.O.P., per unit, Talc-Ground French, Terra Alba-French, English, American, No. 1, American, No. 2, Tin-Crystals, in kegs or bbls., feathered or flossed, Muriate, single, Double or strong, 51° B., Oxy, or nitro, Tin Plates, per box, Swansea, best charcoal, best coko, Vermillion-Imp. English, Am. quicksilver, bulk, Am. quicksilver, bags, Chinese, Trieste, American, Zinc White-Am. Dry, Antwerp, Red Seal, Paris, Red Seal, Muriate solution, Sulphate crystals, in bbls.

THE RARER METALS.

Arsenic-(Metallic), per lb., Barium-(Metallic), per gram, Bismuth-(Metallic), per lb., Cadmium-(Metallic), per lb., Calcium-(Metallic), per gram, Cerium-(Metallic), per gram, Chromium-(Metallic), per gram, Cobalt-(Metallic), per lb., Dysprosium-(Metallic), per gram, Erbium-(Metallic), per gram, Gallium-(Metallic), per gram, Germanium-(Metallic), per gram, Indium-(Metallic), per gram, Iridium-(Metallic), per oz., Lanthanum-(Metallic), per gr., Lithium-(Metallic), per gram, Magnesium-(Powdered), per lb., Manganese-(Metallic), per lb., Molybdenum-(Metallic), per gm, Niobium-(Metallic), per gram, Niobium-(Metallic), per gram, Palladium-(Metallic), per oz., Platinum-(Metallic), per oz., Potassium-(Metallic), per lb., Rhodium-(Metallic), per gram, Ruthenium-(Metallic), per gm., Rubidium-(Metallic), per gram, Selenium-(Metallic), per oz., Sodium-(Metallic), per lb., Strontium-(Metallic), per gm., Tantalum-(Metallic), per gram, Tellurium-(Metallic), per lb., Thallium-(Metallic), per gram, Thorium-(Metallic), per gram, Tungsten-(Metallic), per lb., Uranium-(Oxide), per lb., Vanadium-(Metallic), per gm., Vanadium-(Metallic), per gram, Zirconium-(Metallic), per oz.