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THE "Mineral Industry," the annual statistical number of the ENGI-NEERING AND MINING JOURNAL, which is now in press, is a magnificent volume of about 700 pages, large octavo. Subscribers to the Engineering AND MINING JOURNAL who desire to have this book bound in cloth should at once send their order to that effect inclosing, therefor 50 cents. This will avoid a delay in its delivery which the very large orders already received might otherwise occasion.

DURING the six months ended November 31st the working costs of the Alaska-Treadwell Mining Company were remarkably low. For 120,002 tons of ore mined and milled the total costs, including general charges and insurance and freight on bullion, amounted to \$158,323.95, or \$1.32 a ton. Mining, principally quarrying in benches in an open cut, costs 65 cents per ton; milling and concentration, 33 cents per ton; the chlorination of 2,703 tons of sulphurets, 19 cents per ton, or \$8.42 per ton of sulphurets, which is high when compared with barrel chlorination. General expenses at the mine amounted to eight cents per ton, and those in San Francisco to two cents per ton. The total of \$1.32 was made up by bullion freight and insurance charges amounting to five cents per ton.

While the company has an extremely large mill and is able to mine and mill ores in large quantities, this low cost of working, we believe, is unparalled in the history of mining, at least for mining and milling hard quartz by stamps where labor is comparatively expensive. Results at the Spanish mine, Nevada County, California, found in the ENGINEERING AND MINING JOURNAL of May 5th, 1888, were more economical than at the Alaska-Treadwell, the costs for some months running below 60 cents per ton. But here the ore was soft and easily mined with cheap labor, while Huntington mills, which give excellent results on soft ore, were used in place of stamps. Altogether this record of the Alaska-Treadwell Mining Company is highly creditable to its economical management.

ON another page will be found a popular article by DAN DE QUILLE. recounting some of the difficulties met in treating the ores of Meadow Lake District, California. While we have heard that the failure of the camp as a whole was due rather to the absence of ores of a profitable grade than to an inability to work them, it is certain that these ores will not amalgamate properly, although attempts have been made from time to time with various devices and countless processes.

It seems possible to us, however, that these ores, which resemble greatly those of the Bald Mountain District of South Dakota, may be treated by barrel chlorination. Judging from a few specimens it is a silicious hematute. It is probable that in depth the ore will be found in an unoxi-dized condition, consisting mainly of pyrite. The average grade of the ore is stated to be above \$10 a ton. This would enable a company, if the vcin is large and mining cheap, to make a profit even if the ore requires preliminary wasting. It is possible that at first this would not be required. We believe that there are many ores which can be advantageously treated by the chlorination process, without a previous roasting. Experiments have proven that a high percentage of the gold of ores which contain even a fair percentage of sulphurets can be extracted by barrel chlorination if an oxidizing agent such as nitre cake is used.

As a matter of fact, although the Plattner chlorination process had its first large application in this country in California, little is known there of the improvements which have been made in late years in barrel chlorination, notably at the Haile mine, South Carolina, and the Golden Reward works, South Dakota. The knowledge of this process is confined to the results obtained at the Bunker Hill mine, Amador City, and the Pollock plant in Nevada City. As a consequence, mining men have there maintained that the old-fashioned Plattner plant, with its effective but expensive roasting in reverberatory furnaces, is the best, notwithstanding the expense of working varies from \$9, under efficient management and favorable conditions, to \$13 per ton, against \$3 to \$5 per ton by barrel chlorination.

There are many ores in California which have been experimented with vainly, which. should they be of sufficient value, might be worked successfully by this process; notably such are the ores of Shasta County and portions of Calaveras and Tuolumne counties.

California should awaken to the fact that all the world is passing it in knowledge, and should endeavor to learn what is being done elsewhere

THE CYANIDE PATENTS.

The Attorney-General of the Transvaal has decided that the Mac Arthur-Forrest Company is not entitled to a monopoly of the use of cyanide in South Africa as the company had claimed. He gave his opinion, moreover, that no process in which cyanide is used in a different manner is an infringement on the Mac Arthur-Forrest patent. This decision was reached in an attempt by the Mac Arthur-Forrest Company to restrain the cyanide gold recovery syndicate from using the Malloy process. This process differs from the Mac Arthur-Forrest only in the method of precipitation. Instead of the fine zinc shavings, or filiform zinc as Messrs. MAC ARTHUR-FORREST prefer to call it, sodium amalgam is used.

This amalgam is formed electrolytically from a solution of carbonate of soda in contact with a bath of mercury. In precipitation the sodium combines with the cyanogen atoms of the molecule of auric cyanide, forming sodium cyanide, while the gold is instantly amalgamated. This auriferous amalgam is then strained, retorted and melted as in an amalgamation mill.

While we have no late information as to the efficiency of the process, on its face it would seem to have many advantages over the method of precipitating on finely divided zinc, as no prejudicial elements absorbing cyanogen are introduced into the solution, and the ultimate product is far easier to treat without loss. We understand that the company owning the Malloy patent is confident of a favorable decision in the English suit brought against it by the Mac Arthur-Forrest people. They claim that the Mac Arthur-Forrest patents are invalid, and that they have the fullest testimony to that effect.

This coincides with the opinion we have so often expressed that the Mac Arthur-Forrest patents were untenable, and could never live through the courts. The American purchasers of the Mac Arthur-Forrest patents have stated that they will bring suit promptly against any one using a cyanide process without authorization from them, but so far this announced contention has not been put into effect, although there is at least one mine at which cyanide is being used and no royalty is being paid. The Mac Arthur-Forrest people are undoubtedly aware of this instance of infringement if their patents are valid, but are doubtless reluctant to have a case brought to trial, as what we have long stated, that the process is unpatentable, would be clearly proved, and other companies which are now paying them \$1 a ton royalty would then stop doing so.

THE COST OF PRODUCING SILVER.

In a speech on the silver question delivered by Hon. JOHN R. MCPHER-SON, of New Jersey, in the United States Senate, January 9th. 1893, reference was made to the low cost of producing the metal, and a set of statistics prepared by IVAN C. MICHELS was inserted in the *Congressional Record* as an appendix to the Senator's speech. The data used by Mr. MICHELS were obtained from the report of the Eleventh Census on the production of gold and silver in the United States. From these figures it was made to appear that 1,817,036 ounces of silver were produced in Arizona in 1889 at an average cost of 52[§] cents per ounce; in California, 1,065,036 ounces at no cost whatever; in Colorado, 18,416,861 ounces at 30[§] cents; in Montana, 13,437,661 ounces at 41 cents; and in Utah, 6,966,-933 ounces at 48 cents. Accordingly, the total for these five States, 41,-703,527 ounces, was produced at an average cost of 37.3 cents per ounce. The total production of silver in the United States in 1889 was 51,354,851 ounces.

The fallacy of Mr. MICHELS' results is apparent upon their face, yet they were accepted by so shrewd a man as Senator MCPHERSON, and by newspapers of such high standing as the New York *Times* and the New York *Evening Post*, both of which commented editorially upon the strikingly low cost of producing silver as thus illustrated. The position of the ENGINEERING AND MINING JOURNAL on the silver question is well known. We have been unwavering in our opposition to the free coinage heresy and have exposed repeatedly the perversion of statistics by its advocates. We object equally to misleading statements on the other side of the question as injurious to the cause we urge, and we condemn Mr. MICHELS' figures as erroneous and absolutely worthless.

The elements in their compilation were the gold, silver and lead products of each State and the expenditures as reported by the Census. From the expenditures were deducted the value of the gold produced (calculated at \$20 per ounce) and the value of the lead (calculated at \$60 per ton); the remainder divided by the ounces of silver produced was held to give the cost per ounce ! In making this calculation it was, therefore, assumed that 1,029,987 ounces of gold (nearly 60 per cent. of the entire production of gold in the United States) and 100,847 tons of lead (55 per cent. of the whole product) were produced at no profit whatever. Of course this is rank nonsense. The outcome of Mr. MICHELS' computations is especially ridiculous in the case of California, where 608,936 ounces of gold, 1,065,036 ounces of silver and 53 tons of lead were said to have been produced at a cost of \$12,506,555. The value of the gold at \$20 per ounce was \$12,586,722: lead at \$60 per ton \$3,180; total, \$12,589,902. Mr. MICHELS proceeds thus: \$12,506,551 - \$12. 589,902 = \$83,247-"net profits ou gold; hence the 1,065,036 ounces of silver not costing anything to produce the same,"-a reductio ad absurdum.

One of the greatest difficulties in carrying out any investigation as to the cost of producing silver is the manner in which gold, silver, lead and copper are associated in nature, and the closeness with which the methods of winning these various metals are interwoven. Silver occurs in five ways:

(1.) Silver ores with little or no gold and no base metals, or not enough to make their extraction profitable. In Utah, Nevada, Arizona, Montana and Idaho these ores are for the most part reduced by amalgamation or lixiviation; in Colorado they are sold to the lead smelters. (2.) Silver-gold ores, in which the gold is an important element of value, containing little or no base metals. This includes the great class of silicious or dry ores, which in Colorado are reduced by the lead smelters, and in other States generally by amalgamation or lixiviation.

(3.) Silver-lead ores, auriferous or non-auriferous. These ores are reduced entirely by the lead smelters.

(4.) Silver-copper ores, auriferous or non-anriferous, which are treated for the most part by the copper smelters.

(5.) Gold ores, containing a small amount of alloyed silver. A large amount of silver is derived from these ores, the unrefined gold of the world being seldom worth more than \$18 per ounce, on account of the alloyed silver which reduces its fineness.

In 1891 the Director of the Mint made like attempt to classify the silver product of the United States according to ores with the following result: Total product, 58,330,000 ounces : from quartz and milling ores (1, 2 and 5 in the above classification), 28,625,000 ounces, or 50 per cent.; from lead ores (3), 23,707,000 ounces, or 40 per cent.; from copper ores (4), 5,998,000 ounces, or 10 per cent. Although this division indicates roughly the relative importance of the several classes of silver ores, it tells nothing as to the manner in which the metal is won from them ; an important matter, bearing directly upon the cost of production, for the solution of which there are no statistics. As matters of fact we know that all but a small part¹₄ of the silicious ores of Colorado are reduced by the lead smelters of Leadville, Denver and Pueblo, which also buy less quantities of high grade dry ores from other States, while the lead smelters of Salt Lake City and Montana, as well as the copper smelters of the latter State, are all in the mar ket for pyritous and silicious ores.

The production of gold, silver, lead and copper being so closely allied, the only fair way of estimating the cost of production for any mine, or group of mines, is obviously to charge each metal won with its proportionate share of the expense. If Mr. MICHELS' figures were recalculated in this manner the results would be found decidedly different from those he reported. For example, the 41,703,527 ounces of silver produced in the five States, together with 1,029,987 ounces of gold and 100,857 tons of lead, at a total expenditure of \$42,533,795 would be found to have cost 61 cents per ounce instead of 37.3 cents.

Mr. MICHELS made, however, more serious errors than those of computation. His data are so faulty as to invalidate any deductions whatever.

(1.) The gold and silver products taken are not those reported by the Eleventh Census in its final distribution of the totals by States.

(2.) The expenditures reported do not represent the total cost of production, including only the cost of mining and milling. In the cases of mines equipped with leaching or amalgamating mills the returns made to the Census give approximately the cost of producing unrefined bullion, but in the returns of mines selling their ores to the lead smelters the freight on ore and the cost of smelting were not reported.

It is therefore clearly impossible to make any reliable deductions as to the cost of producing silver from the statistics of the Eleventh Census, and no one familiar with the subject will believe for one moment that the result (61 cents) abtained by recalculating Mr. MICHELS figures (which do not, by the way, take any account of the copper produced in conjunction with silver) represent even approximately the average cost of producing silver in Arizona, California, Colorado, Montana and Utah.

THE more detailed review of the report of Mr. G. M. WILLIAMS, Inspector of the Fourth Anthracite District of Pennsylvania, referred to in our last issue, p. 139, is necessarily postponed. The most important features of it were given in our market report, and attention called to the care with which it had been prepared. We will discuss it at length as soon as possible, and as soon as the report can receive the attention and the space which its importance deserves. It may be noted that the report shows a very gratifying decrease in the number of accidents to miners.

BOOKS RECEIVED.

- In sending books for notice, will publishers, for their own sake and fo that of book buyers, give the retail price ? These notices do not supersede review in another page of the Journal.
- The Financial Review (Annual) 1893. Published by Wm. B. Dana & Co., New York. 1893. Pages, 275. Price, \$2. Illustrated.
- Electrical Experiments. By G. E. Bonney. Published by Whittaker & Co., New York and London. 1893. Pages, 252. Price, 75 cents. Illustrated.
- How to Manage the Dynamo. By S. R. Bottone. Published by Macmillan & Co., New York and London. 1893. Pages, 61. Price, 60 cents. Illustrated.
- Etude sur les Pertes de Charge de l'Air Comprime et de Vapeur dans les Tuyaux de Conduites, par Ch. Ledoux (reprinted from the Annales des Mines), Paris, 1892.
- Water Tower, Pumping and Power Station Designs.—The Engineering Record's prize designs suggested for Water Towers. Pumping and Power Stations. Published by the Engineering Record, New York, 1893

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 Estimation of Barium in Ores.

The Estimation of Darum in Ores. EDITOR ENGINEERING AND MINING JOURNAL: Sir: Mr. Stuart Croasdale in this Journal, Vol. LV., No. 6, p. 130, describes a method for the estimation of barium in ores. I have had some experience with ferriferons lead ores from the Sierra Mojada, Mexico, which bears upon this matter. The results of my analyses are given below. One-half gram (0.50 grm.) was treated with concentrated hydrochloric acid for one hour at a temperature of 70-80° C., filtered and washed. The insoluble matter left was 45.0%, and contained 4.0% BaSti and 41.0% SiO

 $BaSO_4$ and 41 0% SO_3 . Another similar portion was taken and boiled with concentrated hydrochloric acid for 75 minutes, filtered and washed, and boiled again

with concentrated hydrochloric acid for 15 minutes.

The insolutie matter left was 43.0%, and contained 2.0% BaSo4 and

The insoluble matter left was 10 v_R, and contained hydrochloric acid 41 0% SiO₂. Another one gave when treated with concentrated hydrochloric acid for one hour at 70-80° C, insoluble matter 16 1%, which contained 4.8% BaSo₄, and 11 3% SiO₂. When boiled and treated as the boiled sample of the first ore, it gave insoluble matter 13 6%, which contained 2.2% B isO₄ and 11 4% SiO₂. It is evident, therefore, that boiling with HCl may give a result quite different from what would be obtained by treatment at 70-80° C. In

the supplement to his treaties on quantitative analysis Fresenins says that by long boiling of $BaSO_4$ with concentrated HCl a part goes into solution, but I have not been able to find any special reference to the matter in other books on the subject. As barium has to be slogged off in metallurgical operations the im-

As barium has to be slogged on in interacting of a portance of ascertaining the correct amount present is obvious. H. TRACHSLER.

Idaho Diamonds.

EDITOR ENGINEERING AND MINING JOURNAL: Sir: Shortly after reading in your issue of January 7th, 1893, page 14, the interesting article on the Idaho diamond fields, I received from Mr. Louis R. Ruccau at Helena, Mont., two stones which he sent "to prove his assertiou that the Idaho stones were true diamonds." These

Mr. Louis R. Ruccau at Helena, Mont., two stones which he sent "to prove his assertiou that the Idaho stones were true diamonds." These he claims to have found "in the apertures of former volcanoes" uear Walters' Ferry on Snake River, Idaho. Having but little confidence in the story of Idaho diamonds, I sub-jected these stones to every conceivable test. The smaller stone which showed curved crystal faces plainly, broke with perfect cleavage planes characteristic of diamond. The splinters burned, or rather disappeared slowly before the blow pipe, and in the bright red hot mnffle, leaving a small quantity of very light ash. The larger stone, which weighs 0.6 carat, although by no means a perfect crystal, shows the octahedron shape quite distinctly; it scratches sapphire readily and cuts glass quite nicely: its specific gravity as determined with rather crude appliances is nicely; its specific gravity as determined with rather crude appliances is

Both stones were somewhat opaque, and have a decided yellowish tinge, showing high lustre at the same time. After these tests I must pronounce the stones received from Mr. Ruccau true diamonds.

I am sorry not to be able to give more information about the occur-reuee, size, quality, and quantity of the stones.

A. RAHT. PCEBLO, Colo., Feb. 11, 1893 (One or two Idaho stones have been received in this city which have all the characteristics of South African diamonds. Quite naturally, think the dealers, as in their opiniou they were originally mined in Kimberley.—Ed. E. & M. J.)

Proposed Smelter at Spokane. EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Allow me to correct your impression that the necessary variety of ores in the vicinity of Spokane to make it a good point for the successful operation of a smelting plant does not exist.

It is true that the ores of the Coeur d'Alene are almost entirely silver-lead and concentrates, but in addition to these we have the ores of Montana, a goodly proportion of which are "dry ores." Okonogau County, in our own State, is almost entirely a dry ore belt. Stevens County has a fair proportion of silicious ores. Central Idaho has very

County has a fair proportion of silicious ores. Central Idaho has very little except acid ores. British Columbia, on the north, has a large amount of ferruginous and basic ores, in the newly discovered district of the Slocan Kaslo basiu. This last was entirely unknown eighteen months ago; to-day it has 17 different properties in operation. These mines all have from 3 to 10 ft. of carbonates and concentrating ore besides clean galena. The district is tributary to Spokane by the Spokane & Northern Rail-way and also by the Kootenai River & Great Northern Railroad. Contracts have already been let for the hauling of 3,500 tons of this ore from the mines to Kaslo this winter. It is susceptible of proof that there is a sufficient quantity and variety of ores that are directly tributary to Spokane to make smelt-ing a very profitable industry here. We are certainly as favorably situated for it as Omaha, Great Falls and Tacoma, and would not be under the necessity of going any farther away from home for a portion

situated for it as Omaha, Great Falls and Tacoma, and would not be under the necessity of going any farther away from home for a portion of our ores than is Denver, which needs nearly the entire product of the Coenr d'Alene to furnish the necessary fluxes for her "dry ores." It is a fixed fact that if silver continues to decrease in value and the lead trust cannot be broken the Coenr d'Alene mines will shortly be closed down, or their ores will be smelted at Spokane, which would save the long hanl on 50% of their product. REX. SPOKANE, Feb. 3, 1893.

The Duty on Pig-Lead.

EDITOR ENGINEERING AND MINING JOURNAL :

EDITOR EXCINEERING AND MINING JOURNAL: SIR: Your issue of February 11, page 121, gives a decision touching a duty on pig-lead, but as 1 understand it, ordinary pig-lead has only 1½ impurity, and oftentimes less. In this case how could the duty on the gross weight or on the lead contents vary beyond a sum which would be expressed in mills, or even fractions of them? Does not the decision refer to lead bullion in bars? I think that the idea which strikes me will also occur to many others in the trade, and that some explanation of this apparently useless decision will have to be made. E. A. CASWELL.

NEW YORK, Feb. 11.

The term lead bullion in bars is not used in the Tariff Act under discus-sion. The decision of Judge Wilkinson relates to what some people might style lead bullion, but as this expression is not used in the tariff the question was to construe the act as it applied to the material in dis-pute. After submitting the matters to the opinion of those well qualified to decide the question, and finding that the material was known in and to the trade as "lead in pigs or bars," Judge Wilkinson held that it was dutiable at the rate of 2 cents ner nound of gross weight. It does not afto the trade as "lead in pigs or bars," Judge Wilkinson neut that it was dutiable at the rate of 2 cents per pound of gross weight. It does not af-fect the "essence of the decision that "lead in pigs or bars" may, and for the most part does, contain other substances. Whatever may be in the lead is weighed as lead, and must be subject to the duty of 2 cents per pound. Lead ore, for instance, is dutiable at the rate of 1¹/₄ cents per pound of lead contained, and an assay must determine how much of this element is present. element is present.

The fact that some importations of lead in pigs or bars are richer in lead than others does not bear upon this decision If the importation should contain 90% lead and 10% of other substances it would be assessed at the duty applicable to it if it really contained 99.99% of lead and 0.01% of other substances, provided that in both cases it was known to the trade as lead in pigs or bars.—ED. E. & M. J.]

Will Steam and Compressed Air Work Together ?

EDITOR ENGINEERING AND MINING JOURNAL:

Will Steam and Compressed Air Work Together ? EDITOR ENGINEERING AND MINING JOURNAL: Sir: Some teu years ago, when employed in the Sterling Iron mines at Lakeville, N. Y., after carefully examining the lake there, it was decided that the water power could be used to advantage. Accordingly, a turbine and an air compressor were put in, and the hand drilling was done away with. There was a surplus of power, and it was proposed to do the hoisting with air also, but about that time, in 1884, a dull season came on, and there was no work to be done, except to keep the mine free from water. This was done by a large pump taking steam from a boiler which had been put down in the mine to run a small hoisting engine. This made it ueces-sary to send coal down into the nine, requiring considerable work and trouble. To avoid this I tried running the pump with compressed air, but found after a time that there was trouble caused by freezing at the exhaust. Several plans were tried, putting hot water over the exhaust when needed, and placing a stove near it; these answered when the pump was running slowly, but would not do for fast running. The boiler pipes were then connected with the air pipes by two valves, so that when the pump began to freeze the air could be shut off and steam turned ou. I believed then that air and steam could be used in the same pipe, but met with no support; and at last tried the experiment on my own account, with entire success. From that time on the pump was worked with steam and air together, and the pipes were connected all over the mine. At one time we were putting up a new stack and men were scarce. I simply rau compressed air into the boiler and then lifted the stack with a rope attached to the hoister. In my present place I have run steam and compressed air in the drills together without trouble. I want to call attention to this, as there are many places where there is a water power, not enough to do all the work, it can still be used and the deficiency made up by

MATTHEW PENHALE.

The Maud S. Mine, Montana.

EDITOR ENGINEERING AND MINING JOURNAL :

BLACK LAKE, MICH.

Sir: The issue of the Journal for January 21st contained a letter in reference to the Maud S. mine, southeast of this city, written by W. F. Smith, of Pittsburg, and, as it has caused considerable criticism, I would ask you to publish the following statement of the Maud S.

would ask you to publish the following statement of the Maud S. transaction: Late in the fall of 1891 a geutleman from Pittsburg, uamed Anthony Barker, whose present address is 315 Wood street, Pittsburg, arrived in this city to look after some mining property. I had the pleasure of making his acquaintance, and he told me that one of the principal objects of his visit here was to examine the Maud S. mine for the pur-pose of placing it on the market if found of sufficient value. Some time after I heard a good report of the Maud S. and, without consulting the owner, Dr. Whitford, I wrote to Mr. Barker, at the same time telling him that I could not give him any information from my own personal knowledge, but recommended him to write to Dr. Whitford. Correspondence was continued for quite a while between Mr. Barker and Dr. Whitford, and I have no hesitation in saying that there has never been one word of undue praise given the property by Dr. Whitford. There was no exaggeration made about the property; and with all due respect for Mr. Farish, and his knowledge of gold properties, I would say that the ore bodies are even better than re-ported, as has been proved by parties who are now working the property under lease. The most that has ever been claimed for the Maud S. property was that it was a good gold proposition that would require money to develop, and which the owner was willing to lease to any responsible party for that purpose on reasonable terms. And let me state that there was no sale attempted by Dr. Whitford at that time

E. A. CASWELL.

whatever; it was nothing more than a lease, as the papers given to Mr. Barker will show. There was a bonus asked of \$6,000 for the purpose of buying some outstanding shares and paying some indebtedness. This Barker will show. There was a bonus asked of \$6,000 for the purpose of buying some outstanding shares and paying some indebtedness. This was well known to the gentleman in Pittsburg, and he was perfectly

of buying some outstanding shires and paying some indecledness. This was well known to the gentleman in Pittsburg, and he was perfectly satisfied. The parties had six months to investigate before any further payment would be made, and if satisfied then with the property they still had a further six months to make the final payment. Just as soon as Mr. Farish's unfavorable report was learned here, other parties asked for and obtained a lease on the property. They are now sacking \$100 ore from a 22-in. vein. It is expected that a shipment will be made in a few weeks. Mr. Smith aks: "Cannot some law be formulated and adopted by which to hold venders of mining 'fakes' strictly responsible, even though they but try to dupe investors?" It is hard to see how any price on his property, any more than it would be to compel Mr. Robert Bonner, of New York, to sell his Maud S. for the price of a Montana cayuse. In fact, the only parties who might suffer from such a law would be the middlemen, who approach the capitalist for the purpose of making a sale, so as to get their commission and "whatever more they may have added to the owner's price." WILLIAM COLLINS.

Argentine.

EDITOR ENGINEERING AND MINING JOURNAL: Sir: The article in The Engineering and Mining Journal of April 23d, 1892, on Argentine I have only lately had opportunity to review. It is a very good translation of my article in the "Papier-Zeitung" (Ber-lin), 1891, No. 16, but there are two errors in it, which I shall rectify. It was said that "the undissolved metal is exhausted by boil-ing three times times that have have a when it is washed and dried."

rectify. It was said that "the undissolved metal is exhausted by boli-ing three times with fresh acid, when it is washed and dried." "The turnings of white metal do not have to be washed and dried before the exhaustion with acid has taken place, but they must first be boiled with acid (about three times) until the chief part of the tin has dissolved; then, only, must they be washed and dried, and may so be sold to chemical factories. Again, it was said that "they (the wooden casks) are filled with water, and an iron basket well plated with tin and holding zinc scrap is susnended in each"

water, and an iron basket wen plated with the and holding zine scrap is suspended in each." If it would be made in this way, the result would never be a clear tin sponge, but constantly mixed with crystals of tin. It is this which must be prevented.

Our practice was as follows: Old zinc, zinc wastings and zinc scraps Our practice was as follows: Old zinc, zinc wastings and zinc scraps, were used for forming plates of about 30 cm. length, 20 cm. breadth, and 11.3 kilos, of weight. Each of these plates had a hole through which an iron S-formed hook entered. These

were user for forming parters of about about the formation of the lagra, and a hole on the top, through which an iron S-formed hook entered. These hooks were well plated with tin, so as not to be acted upon by the tin solution, and were so hung on the upper edge of the wooden cask that only the zinc plate reached the liquid, while the hooks did not touch the solution. Then the zinc dissolved entirely in the solution and the tin separated itself as a sponge. By this ordinary method the contact of zinc and tin in the solu-tion is absolutely prevented. This must be done, as otherwise an electrical current is formed by the metals, which effects the formation of crystals on the tin electrode. If a complete zinc-tin element or a zinc-lead element is placed in the tin solution, both plates being separated by a wooden board, an electrical current is formed, and, finally, crystals and needles are formed on the tin or lead plate and clear sponge on the zinc plate. The crystals and sponge are entirely separated by the partition of wood. My latest experiments have caused the following conclusions: The only physical difference between crystals and sponge is the size.

My latest experiments have caused the following conclusions: The only physical difference between crystals and sponge is the size. A chemical difference does not exist, for the composition of both is tin, with very small quantities of lead and antimony. It is quite peculiar that the same substance fastens on both electrodes.

It is duite pecuair that the same substitute fastens on both electrones. This declares itself only in the following ways: 1. By the influence of the electrical current the solution of the de-composes itself so that the positive element (the tin) in the form of needles coats the negative electrode (the lead plate), while the negative element (the chlorine) goes to the zinc, where it forms zinc chloride. 2. At the same time the chemical decomposition of the tin solution by since takes place the zinc discloses as zinc chloride, and the tin will

2. At the same time the chemical decomposition of the fin solution by zinc takes place, the zinc dissolves as zinc chloride, and the tin will separate on the zinc, forming a sponge. The zinc decomposes also the free hydrochloric acid, displacing its hydrogen, the latter forming bubbles between the tin particles, forming good sponge.

LEOBEN, Austria, January, 1893.

DR. AUGUST HARPF.

The Persistance of Ores in Lcdes in Depth.

EDITOR ENGINEERING AND MINING JOURNAL :

Sir: There are many theories as to the source of mlnerals in lodes, and there are many theories as to their origin. One mineralogist bases his theory on his limited experience in one district and one class of formation. The second bases his theory on a different formation, hence theories are about as plentiful as the different formations, and while each may be approximately correct for his special experience, it is a mistake to suppose that one theory will meet all cases. In my experience I have observed vein formation where I have believed the fissures to have been filled from above; also veins filled from below, and many where the action has been lateral. To discuss the subject properly, it would be necessary to take a special case. Professor Blake, in his article in the Engineering and Mining Journal, mentions the case of the Allison Ranche Gold Mine, Grass Valley, Cal. Accord-ing to his theory that vein, being in granite, ought to be uniform in richness to an indefinite depth. Experience in working the mine, how-ever, has shown this theory to be unreliable. The vein was rich near the surface, but became barren at 30 ft. in depth. Water was abund-ant near the surface, as the mine was in the bed of a creek. The rich portion of the vein seemed to be in the form of a chinney in a fissure, which might have an indefinite depth, but the quartz below There are many theories as to the source of minerals in lodes

this is almost devold of the precious metals. Again, Professor Blake mentions the old Amador Mine of Sutton Creek. This mine is on the mother lode of Amador County, where the gold bearing shoots ap-pear to come up diagonally in the lode, so that if a shaft is sunk, fol-lowing the normal pitch of the lode, the pay shoot of ore may not be struck for 500 or 600 ft., as was the case in the Hayward and Idaho mines, and at a depth of 1,300 or 1,400 ft. the pay shoot may have gone its diagonai pitch out of the property. There is one peculiar fact in some lode formations which Professor Blake has not mentioned. In a mining district near Redding, Shasta County, Cal., called the Old Diggins, my attention was recently called

Blake has not mentioned. In a mining district near Redding, Shasta County, Cal., called the Old Diggins, my attention was recently called to a peculiarity which has kept back the development of the mines of that district for twenty years. The country rock is what is generally known as porphyry, in a belt about 3 miles wide, the quartz lodes running in a nearly north and south course, cutting the formation about 45° , and the pitch of the lodes are toward the east. The croppings, as a rule, are larger—4 ft. to 12 ft. wide—and rich in gold, with very little silver. The sulphurets contain iron, copper, tellurium, bismuth and gold and silver. Now these lodes have invariably pinched out in about 30 to 60 ft. In depth, leaving nothing but an irregular parting hardiy visible. When this was reached the mine was abandoned, and so the district was gradually was reached the mine was abandoned, and so the district was gradually abandoned.

abandoned. I was struck with this peculiarity of what we would call a fissure vein pinching out in 40 ft., and I secured a mine and began exploration in depth. About 25 ft. below the old shaft bottom we struck the ledge again. It came in like a thin edge of a wedge and opened to 3 ft. wide in a depth of 5 ft. The first 2 ft. of the ledge contained 20% iron sulphurets which, when concentrated, assayed \$1,500 per ton in gold. At a depth of 50 ft. below where the ledge came in the vein averages 4 ft. wide, the ore averaging \$30 per ton in gold. Where the lode was fouried the sulphurets were abundant and exceedingly the lode was faulted, the sulphurets were abundant and exceedingly rich; whereas now the ledge is more uniform and regular. SAN FRANCISCO, January 14, 1893. ROBERT STEVENSON.

THE DECOMPOSITION OF TIN SLAGS.

Some time ago Mr. H. N. Warren, of Llverpool, England, recomsome time ago and the addition of borax as a flux to the mixture of carbonates of potash and soda, used in decomposing silicious slags containing the oxides of tin and antimony. As this addition made the previous tedious operation become rapid and complete, it has been adopted very generally. Mr. Warren now writes to the "Chemical News" that it has been lately found that the oxides of tin and antimony thus monomed are by a more fixed when subjected to high former uses. prepared are by no means fixed when subjected to high temperatures in contact with alkalies, and states that in numerous instances the fumes

contact with alkalies, and states that in numerous instances the fumes collected by volatilization from the crucibles containing the substances, have been found to contain notable percentages of both tin and anti-money. Mr. Warren has another, or "fluoride," method, of which we give a short description herewith: A convenient portion of the slag in a fine state of division is placed in a platinum dish. Equal quantities of hydrochloric and hydrofluoric acids are added while the dish is exposed to gentle heat on a sand-bath for a few moments. The slag almost immediately dissolves, and the solution its divided into two halves. One half is precipitated by the addition of sulphuretted hydrogen. The precipitated sulphides of tin and antimony thus obtained are, if necessary, purified by re-solu-tion, and are then ignited and weighed as oxides. The second half is rendered alkaline by the addition of ammonia, and

The second half is rendered alkaline by the addition of ammonia, and a large excess of oxalic acld is added. On the introduction of sul-pluretted hydrogen, as before, antimony sulphide alone falls down. This is ignited and weighed as oxide. From the weight of the mixed oxides already obtained, the antimony oxide is subtracted to obtain the amount of tin oxide.

By this method a complete separation and estimation of both metals can be performed in less than an hour. Over 300 samples of a like nature have been treated by Mr. Warren during the last year, and have been proved accurate within 0.2%.

Russian Petroleum Syndicate.—According to the "Gaz-tte de la Bourse," of St. Petersburg, a new syndicate was formed in December last to control the Russian petroleum business. The new syndicate, at the head of which is the house of Rothschild, includes 135 producers of oil; the contract will extend for five years beginning January 1st, 1893.

A Large Casting in India.--The largest casting ever made in India was the anvil-block for a new steam-hammer, which was recently cast at the Jamalpur shops of the East Indian Ry. The block was cast close to the spot where it will be used, and weighs about 38 tons. The iron used was a mixture of Indian iron and imported (English) pig.

What is Electricity ?--Mr. S. F. Walker, in discussing this question in an article in the London "Electrical Engineer," says: "As far as the writer is able to understand the matter now, electricity is simply the motion of the molecules of the different substances which are the submotion of the molecules of the different substances which are the sub-jects of electrical action, just as heat, light and sound are, and the only difference between these forces is the rate of the motion. The motion of sound, as we all know, is comparatively slow; that of heat and light is very rapid. That of electricity would appear to be somewhere be-tween the slow motion of sound and the rapid motion of the heat waves, whose motion is slowest (that ls, slower than that of light.) And it would appear that the wonderful adaptability which electricity shows for every kind of work is due entirely to the position which its rate of motion occupies in the scale of the energies. It would also ap-pear that the reason this wonderful agent lay dormant for so many ages, and is even now only partially developed, is very largely, at any rate, because we have no sense which responds to the particular periods of vibration comprised within the electric range."

MINING AND PREPARING BORAX.

MINING AND PREPARING BORAX. The work of mining the borate of lime does not differ essentially from that of procuring other minerals. The character of the material, however, is such as to require exceptionally heavy timbering, while the absence of water and fuel largely increases the cost. These items are more important by reason of the exceedingly low value of the ore, which necessitates economy at every step. The distance of the Death Valley mines from the railroad is fatal to their present profitable working. The product of the mines must be hauled in wagons, in a way indicated by the illustration, which shows the teams ready to start. The Calico mine lies nearly 10 miles from the track, but the railroad transportation to a suitable point for manufacture involves a distance of nearly 400 miles. The treatment of the crude borate consists in liberating the boracic acid from the lime and other impurities, and uniting it with soda to form the bi-borate of sodium, or borax proper. This necessitates a combination of mechanical and chemical operations not easily de-scribed in writing. For the handing and pulverizing of the ore, the best modern appliances are employed. When the heavily charged liquors are in the proper condition, they are drawn off into immense cooling and crystallizing tanks, where the crystal borax forms upon multitudes of steel rods suspended in the vats. The ordinary borax, known as concentrated, is refined by successive rystallizations until it reaches the proper degree of purity. It is then passed through the dryers, or spread on the floors, and thence to the sacking and barreling rooms for shipment to market.

MANUFACTURE OF POTASH, SODA AND MAGNESIA FROM KAINIT.

In "Le Genie Civii," M. D. Lidersky describes the new process adopted by the Buckau Chemical Company, of Magdeburg, for produc-ing pure potash, soda and magnesia from the kainit deposit of Stass-furth, Germany. Most of this kainit is sold as manure, and only a very little has been employed in the manufacture of potash, partly because so many useless bye-products were found, and partly because it was difficult to obtain a pure potash with the Leblanc process, which was the only one employed. The new process uses up all the bye-products, and besides potash it produces soda, calcined magnesia, crys-tallized subhate of lime, hydrochloric acid and subhuric acid. The was the only one employed. The new process uses up all the bye-products, and besides potash it produces soda, calcined magnesia, crys-tallized sulphate of lime, hydrochloric acid and sulphuric acid. The average composition of the kainit used is MgSO₄ 16-18%; K.SO₄22-24%; Na Cl 30-4%. These silts are first converted uniformly into su-phate, by treatment with sulphuric acid. The hydrochloric acid pro-duced is condensed. Concentrated milk of lime is then added to the boiling solution of sulphates to decompose the magnesium sulphate. The lime dissolves, but when left at rest for some days after slow cool-ing, the sulphate of lime separates out as a heavy crystalline powder covered with a lighter deposit of magnesia. The solution is then re-moved and the magnesia and sulphate of lime washed, separated, and collected in a filter press. The solution is then treated for the separa-tion of the potassium and sodium salts. Barium sulphide is added with the resulting production of insoluble barium sulphate and solutions of the alkaline sulphides. The solution is boiled down to a strength of 20° B. and subjected to the action of pure carbonic acid gas obtained from the decomposition of alkaline bicarbonates. The sulphides are



BOXAX LOADED WAGONS STARTING OUT-DEATH VALLEY, CAL.

The quantity of borate handled during 1892 reached a total of some 5,500 tons. The current output is in excess of this ratio.

PEROXIDE OF SODIUM AS A BLEACHING AGENT.

The Aluminum Company of London is placing peroxide of sodium on the market as a commercial bleaching agent. This company was started for the purpose of manufacturing aluminum by Castner's pro-cess, but on the introduction of the cheaper electric processes was obliged to turn its attention to other methods of making money. Among other things they found outlets for the metallic sodium used in their aluminum reduction process. Their latest use of sodium is to prepare sodium peroxide in a form suitable for bleaching. This compound has not hitherto been used commercially; in fact it is chiefly known on account of the ease with which it is formed in the attempt to produce an not hitherto been used commercially; in fact it is chiefly known on account of the ease with which it is formed in the attempt to produce an absolutely pure hydrate of soda. In preparing this compound commer-cialiy, metallic sodium is placed in a series of aluminum dishes which run on rails inside an iron tube. The interior of the tube is kept at a uniform temperature of 300° C. by exterior heating. Air, freed from moisture and carbonic acid, is fed into the tube at the end at which the aluminum vessels come out. The vessels are continuously removed as they come out, and are replaced by others newly filled with sodium at the other end. The amount of air and the speed of the line of vessels have to be arranged by experience. The air peroxidizes the sodium in its passage over the vessels, and when it is richest in oxygen, viz., at the end where the vessels come out, it acts on the sodium which is the most peroxidized, and so completes the oxidation. peroxidized, and so completes the oxidation.

decomposed; sulphuretted hydrogen is evolved, and bicarbonate of soda and potash formed. The sulphuretted hydrogen is burned and converted into sulphuric acid. The bicarbonate of soda is almost in-soluble in the cold solution, and is separated by filtration. The potas-sium bicarbonate is obtained by boiling down the filtered liquid. The bicarbonates are calcined into neutral carbonates, and the carbonic acid gas driven off is employed in the decomposition of the alkaline sul-phider. phides.

LEAD POISONING AMONG GLASS POLISHERS.

At the town of Baccarat, in the East of France, a great glass-making center, there have been many cases of lead poisoning among the polishers of crystal glass. It is stated that at one works no fewer than 39 out of the 200 polishers have suffered from lead poisoning. In some cases repeated attacks have occurred in the same individual. One case cases repeated attacks have occurred in the same individual. One case ended in death and seventeen operatives were obliged to leave the business. The polishing is done with so-called "tin ashes," which con-sists of lead stannate, prepared by calcining three parts of lead with one of tin. The polishing is done wet, but a portion of the powder dries and forms a dust which is inhaled by the workmen. Of course, at-tempts were made to find some efficient substitute for "tin ashes." Metastannic acid, prepared by acting on granulated tin with strong ni-tric acid and a gentle heat, was first tried, but was found to be unsuitable alone. It was therefore mixed with half its weight of tin ashes and alone. It was therefore mixed with half its weight of tin ashes, and this mixture has given satisfaction both as a polisher and on account of its freedom from danger. It contains only 20% of lead as com-pared with 61% in the tin ashes.

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A BRIEF GOLDEN DREAM

Written for the Engineering and Mining Journal by Dan de Quille.

Following the discovery of silver in Nevada, and the grand excite-ment incident to the opening and development of the mines of the Comstock, were numerous minor excitements, as the Reese River, To nowing the discovery of silver in Accada, and the grand occurs ment incident to the opening and development of the mines of the Comstock, were numerous minor excitements, as the Reese River, White Pine, Pioche and other mining "rushes." In all these interior camps of Nevada, however, good mines were opened, and for many years large amounts of gold and silver were annually extracted; there-fore, the people who were attracted to them, found and enjoyed for a number of years a good degree of prosperity, if not the large fortunes they had anticipated. The most disastrous mining excitement ever participated in by the people of the Comstock was that of Meadow Lake, in 1865. The mines of Meadow Lake were discovered by a Virginia City man named Hartley. They are situated in the high Sierras, in Nevada Connty, Cal., where in winter the snow falls to a depth of from 10 to 20 ft. on the level. The mines being discovered by a Comstocker, men of the Comstock had the first information in regard to their richness, and began the rush, soon to be followed by the people of a number of California .nining camps. The mines of Meadow Lake district were of such a nature as to excite in the hearts of all the highest hopes of good fortune, and then dash from their lips the cup of happiness just when it seemed most firmly in their grasp. The veins of the district were all largely composed of iron. In the croppings, and to a considerable depth below the surface, the veins in the day mater and dow and begamensed leaving the

from their lips the cup of happiness just when it seemed most firmly in their grasp. The veins of the district were all largely composed of iron. In the croppings, and to a considerable depth below the surface, the iron in the quartz had oxidized and decomposed, leaving the contained gold free. From the veins at the very surface, and even above the surface in places, one was able to pan ont of the red oxidized material big prospects of free and glittering gold. In places men made eight and ten dollars a day with rockers, carrying the dirt they washed a considerable distance in sacks. Gold seemed abundant everywhere. There were hundreds of quartz veins, great and small, and in all gold was found in the decomposed material at the smrface, while in places there were only rich pockets. As far as the veins were opened by means of cuts, inclines and shafts the favorable pros-pects continued. pects continued.

were opened by means of cuts, inclines and shafts the favorable pros-pects continued. Feeling secure as regarded the value of the mines, the people turned their attention to the building of dwellings and other structures, neces-sary to a comfortable residence in that snowy region in the winter. The mines were all right; nobody could doubt that; the main thing was to be comfortably housed before the big snows came. Only a few remained in the camp the first winter. The next spring and summer—the good prospects continuing in the mines—the boom began in earnest. There was a grand rush from both Nevada and Cali-fornia. As if by magic a town of some 5,000 inhabitants appeared on the shore of the beautiful lake. There were stores and shops of all kinds, a theatre, stock exchange, daily newspaper and hotels, lodging houses, restaurants and saloons, almost without number. On the lake was a fleet of twenty sail boats; a brass band played nightly on the lake as the plaza; quartz mills were being erected and in the town new buildings were going up on all sides; everybody seemed on the high road to fortune. The summer weather in that elevated region was like early spring in the valleys. The grass was fresh and green in all the dells, and everywhere beautiful mountain flowers were bloom-ing. Almost daily there were music and dancing in a score of places about the town. Nowhere in the mountains was there to be found a more beautiful place than Meadow Lake, or a hannier neonele theory

ing. Almost daily there were picnic parties or excursions upon the lake, while of nights there were music and dancing in a score of places about the town. Nowhere in the mountains was there to be found a more beautiful place than Meadow Lake, or a happier people than those who made the town their home. But their happiness was brief. Rnin soon stared hundreds in the face. The decomposed surface material of the veins was soon worked out—almost as soon as the first mills were started—and below was found the solid, bright, unchanged iron. This iron held the gold in its grasp and could not be made to yield it up by any process of working that could be invented, though scores were tried. Down went the shares of all mines; down went the prices of buildings in the town and all property—down went everything far and near in that grandly beautiful mountain region. At first houses and property could be sold for something, but soon people were obliged to desert the place, leaving behind homes upon which they had spent their last dollar. In one or two winters the roofs of the deserted buildings were crushed in by snow, and soon the whole town became a ruin. Only one man remained in the place, and that was Hartley, the discoverer of the mines. He is there to this day, and is now known as "Hermit Hartley." He has faith in the mines he found so many years ago, and manages in some way to dig a good deal of gold out of the iron-bound veins of the district. Hartley even winters alone in a house which is still standing in the old town. This is a strong, steep-roofed two-story building, and in winters so deep is the snow that he uses one of the windows of the upper story as a door. All his excursions abroad are made on Norwegian snow shoes. Every year we hear of some man who has a process by means of

door. All his excursions abroad are made on Norwegian show shoes. Every year we hear of some man who has a process by means of which the ores of Meadow Lake can be made to yield up their gold, but we hear of no man's process proving a success. Some day a way of working the ore will be hit upon; then, perhaps, there will be seen on the shores of the lake a new town that will far surpass that which the old-time pioneers left behind them when the "iron entered their souls" and they fled the country.

Pennsylvania Railroad Lines. – According to the statement of Chief Engineer W. H. Brown, the Pennsylvania Railroad Company now operates 4,542 miles of road east of Pittsburg and Erie; of this 109 miles were built in 1892. On these lines there are 8,891 miles of track, an increase of 344 miles over last year. The lines west of Pittsburg and Erie include 3,437 miles of road, an increase of 25 miles. The total mileage is 7,979 miles of railroad, on which there are 2,033 miles of second, third and fourth tracks and 4,266 miles of sidings.

LEAD AND ZINC MINING INDUSTRY OF MISSOURI AND KANSAS IN 1892.

Written for the Engineering and Mining Journal by J. R. Holibaugh.

This review is confined to an area in southwest Missouri and southeast Kansas, of about 60 miles from east to west, by 30 miles from north to south; or extending from Aurora, Mo., on the east, to Galena and Empire, Kan., on the west, the northern boundary beginning at Alba, Mo, the southern at Newtonia and Pioneer. Twenty years ago no zinc ore had been mined from this area, and but

little was known concerning the value or extent of its ore deposits. The exploration of the lead mines led to the opening up of what have proved to be the most extensive zinc ore deposits in the world, and have attracted the attention of capitalists of this country and of Europe. Up to three years ago the mines were worked in the most primitive manner, but great progress has been made in adopting improved ma-chinery and modern methods of mining. The lead and zinc mining industry has built up such large and prosperous towns as Joplin, with a population of 18,000; Webb City, 8,000, and Cnsterville, 6,000, with many others of less importance The market value of zine ore on January 1st, 1892, was from \$23.50

to \$24 per ton of 2,000 fbs, at the nines, and, as there was only a small stock on hand at that time, the output of each week was taken stock on hand at that time, the output of each week was taken promptly by the smelters. As the year advanced and the output in-creased, the price declined to \$21.50 to \$22.50 per ton, at which figures the large operators stocked their output, and then made sales of 300 to 500 ton lots. It was expected that Enropean buyers would enter the market, but as satisfactory rates of transportation could not be arranged, not more than 3,000 tons of ore was shipped abroad during the year. The Empire Zinc Company shipped 50 tons of spelter to Europe, and it is believed that it will prove more profitable to ship the metal there than the ore. The following are a few of the more prominent mines: At Joplin the Granby Mining and Smelting Com-pany is the oldest concern, and owns several hundred aeres of mining the metal there than the ore. The following are a few of the more prominent mines: At Joplin the Granby Mining and Smelting Com-pany is the oldest concern, and owns several hundred acres of mining land, which it leases out in mining lots of 200×200 ft. to miners on the royalty plan. The Oswego Mining Company owns 700 acres of mining land, which it leases out in mining lots of 200×200 ft. to miners on the organity plan. The Oswego Mining Company owns 700 acres of mining land, within the corporate limits of Joplin, subdivided into mining lots many of which are leased out on royalty to miners and mining com-panies. The Guinn & Loyd mining lands of 400 acres have been closed down the greater part of the year, but have recently resumed operations. The Roaring Springs Land and Mining Company, the o'Keef mines and the Mahaska Mining Company, Ltd., are old and steady producers. South of these is a tract of 200 acres, Eagle Mines, owned and operated by the Empire Zinc Company, W. C. Wetherill, Manager; Pope Yateman, Superintendent, worked in a systematic manner; the underground surveys are posted every month. The same company owns 220 acres of land in the west end of the city, 80 acres of which is being worked as the Kohiuoor Mines. Among the new mines in 1892 near Joplin, the most prominent is the Rex Mining and Smelting Company, with a capital of \$1,000,000, with 1,000 acres of land. Work was commenced in October, 1891, on this property, the Crossman Brothers & Porter Mining Company, which reached ore at 65 ft., the Stilwell Lead and Zine Company, the American, the Gotham, the Bishop, the Columbiau, the Jersey, the Heddens, the Crossman, the Rich Hill, St. Joseph and other companies leasing from one to five lots each, such as the McKee and McIntire, Bell Boy, Pem-berton, Lucretia, Gregory, Royal, Victoria, Keller and Randall. There are now five ore dressing plants in operation representing a total cost of about \$35,000.

berton, Lneretla, Gregory, Royal, Victoria, Keller and Randall. There are now five ore dressing plants in operation representing a total cost of about \$35,000. There are now about 50 producing shafts which give an output of 250 to 300 tons of zinc ore weekly. The American Mining Company, locally known as F. M. Sharp's mine, has made the important discovery of a large deposit of boulders of zinc ore. The development, second in importance is that of the Ruby Mining and Smelting Company. This company is now producing 50 tons weekly from its S0-acre tract. The owners of this property, securing a lease of 40 acres in the south end of Joplin, have spent the past five months in development work. They now have five shafts in ore, and have completed a large concentrating mill. At what is locally known as the Tanyard and Gordou Hallon district, great progress has been made in opening up undeveloped lands, the most promhent of which is the Scotia mine, owned and operated by Col. H. H. Gregg. This property contains 80 acres. We are reliably informed that over 1,200 tons of zinc ore has been sold from this land during the year. The old mines of the Webb City and Carterville district, such as the Center Creek, the Sncker Flats, the Tracy, the Ashcraft, Reynolds and the Noble, have made a steady output throughout the year. The Carterville portion of the district has made a rapid advance in output. This is one to the unimpared output of the old mines and the opening of new properties. The output of the entire Webb City-Carterville district has rarely fallen below \$35,000 weekly. Directly north of this is Oronogo, the oldest mining 250 weekly. Directly north of this is of the Alba. Here in the past years very little mining but surface work has been done, but during 1892 an ore dressing plant was built, and as a result the mines have made an average output of 40 tons weekly. South of this are the Pleasant Valley and Carthage mines. Here no particular improvement has occurred. About 25 milles southeast of Carthage is found the ne

In the old Granby mining district, where mining for lead has been carried on by the Granby Mining and Smelting Company for almost 45 years, a considerable amount of development has been done by pros-

pectors and the Granby company. To the south and southeast the Granby company has drilled holes to a depth of 200 ft., and has dis-

Granby company has drilled holes to a depth of 200 ft., and has dis-covered good deposits of zinc ore. Galena, Cherokee County, Kan., is located at the extreme west of this lead and zinc mining belt, but, like all the other points, has main-tained a steady output of both lead and zinc. The extremely heavy rains in the early part of the year almost drowned out the old mines on the south side, the Galena and the Bonanza's land. This greatly restricted the output at the beginning of the year, but in the end proved a benefit, as it caused the prospecting in new and undeveloped lands to the west and southwest. Development has proved these lands to be rich. A very large and modern zinc smelter has been built at Galena, and last week made its first shipment of spelter. In 1891 the output was 28,368,408 lbs. of lead ore, and 274,751,857 lbs. of zinc ore; In 1892 this was increased to 48,252,890 lbs. of lead ore, and 312,800,000 lbs. of zinc ore. The figures for 1892 are estimated

ore, and 312,800,000 lbs. of zinc ore. for the last two weeks of the year. The figures for 1892 are estimated

From the best information obtainable the stock of zinc ore in the hands of the mine operators ready for market was about 3,500 tons at the close of the year.

FAN WITH ELECTRIC MOTOR.

There are few purposes to which the electric motor can be applied to better advantage than in running fans for ventilation or blowing. A connection by wire with a power circuit does away with the neces-sity for engine, boiler, shafting, or belt, and places the fan under immediate control. The very high speed at which it is possible to

THE MINES OF SIERRA MOJADA, MEXICO." By Eugene O. Fechet.

the camp

The history of the Sierra Mojada must necessarily be brief, as the first settlement was made less than 15 years ago, and there is an absence of the startling incidents characterizing the early history of

mining camps in the United States. Twenty years ago the section of country now comprising the mining district of Sierra Mojada was known only to the smugglers who sought



VENTILATING FAN WITH ELECTRIC MOTOR.

run them gives large capacity, so that a small fan occupying but little space can be used to ventilate buildings of considerable size. When run at proper speed they are noiseless and cause no inconvenience whatrun at proper speed they are noiseless and cause no inconvenience what-ever. The fan can be set up in any position, without affecting the running of the motor, and for this reason it may be located to discharge in exactly the required direction, and connection easily made by pipe. In the dynamo rooms of electric light plants, they are naturally to be preferred to any other means of ventilation. They are admirably adapted for blowing forge, boiler or furnace fires of any description, for cold storage warehouses, planing mill exhausters, and, in fact, for any purpose where a large volume of air is to be handled with the least expenditure of power. The illustration given shows a fan with electric motor, made by the National Electric Manufacturing Company, of Eau Claire, Wis.,

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the National Electric Manufacturing Company, of Eau Claire, Wis., which is a neat and compact arrangement. These fans can be made either right or left hand, to discharge in any direction desired. Two of them recently furnished to the new shops of the Bucyrus Steam Shovel and Dredge Company, in South Milwaukee, have given complete satisfaction.

Fractures of Tires on German Railroads.—A report recently published shows that for a period of seven years, 1884-1890 inclusive, the average number of fractures of steel thres on the German railroads was 0:28 per 100. On locomotive wheels the average was 0:50 per 100; tender wheels, 0:65 per 100; passenger carriage wheels, 0:38 per 100. In 1890 there were 30 accidents resulting from the breakage of tires on the German lines. It is believed that many of the fractures are due to the fact that three new hort in service too long after they are wore down fact that tires are kept in service too long, after they are worn down too thin for safety.

the remote solitudes of these mountains for the protection of their traffic.

the remote solitudes of these mountains for the protection of their traffic. During the pursuit of a band of these smugglers in the year 1878 by customs guards, the discovery of silver-bearing ore was made by Nestor Ariola, a member of the pursuing party. The first "find" was made upon a hill called "La Blanca," which forms a buttress to the Sierra Mojada at the point of its highest elevation. This first discovery proved to be a small chamber, or pocket, and was soon exhausted. All of the present prominent and paying properties are located within a mile of this first "discovery" of the camp. Owing to the low grade of the ore, the scarcity of water and the tedious and expensive methods of extracting the silver by the "hornos," or "adobe" furnace, there was little activity in mining until about the year 1876, when the Mexican Ore Company (an American organization with headquarters of company at El Paso, Tex.) commenced to ex-port the ore to the United States. Since the first shipment there has been a steady increase to the present time, when the daily shipments aggregate 500 tons, of which about one-half is exported to the United States for reduction treatment, and the balance is shipped to the

aggregate 500 tons, of which about one-half is exported to the United States for reduction treatment, and the balance is shipped to the smelters at Monterey and San Luis Potosi. The method of transportation prior to July, 1891, when the Mexican Northern Railroad was completed, was by mule teams, and for some years previous to the advent of the railroad there were from 8,000 to 10,000 mules engaged in this traffic. Now this number has been cut down to some 500, employed in hauling the ore from the mines to the railway. This latter number will be still more reduced as soon as the railway shall be completed directly to the mine dumps. There are three mining zones in the municipality of Sierra Mojada, embracing 63,000 square metres and covering all the valuable territory

* Abstract of United States Consular Report.

now known in the district. The first concession for a mining zone was granted in the year 1888, the second in 1890, and the third in 1891. The granting of these mining zones has been a serious drawback, and has retarded the rapid development of the camp. The private and in-

has retarded the rapid development of the camp. The private and in-dividual prospector is debarred from prospecting or locating a mining claim within the conceded zones. Hence, all claims have to be secured by purchase or lease from the concessionaires. There are some 30 mines known to exist in the district, but only 11 are producing ores at the present writing. The output of the camp from the beginning up to October 1st, 1892, approximates 500,000 short tons and 85,000 tous of silver-lead bullion, the product of the Esmeralda Smelting Company, the only smelter located at Sierra Moiada. Mojada

Mojada. The inhabitants of the municipality of Sierra Mojada number about 8,000. Of this number the laborers engaged in mining and the in-dustries consequent thereto aggregate about 40%. The general conformation of the district is very simple. A valley commencing at the "Puerte de Oro" (Golden Gate), 13 miles east of the town of Sierra Mojada, runs nearly due west, with an average width of about 2 miles, and terminates about 8 miles west of Sierra Mojada camp in a cul-de-sac. The narrowest portion of the valley lies west of the town. This valley is bounded on the north by the Sierra Planchada and on the south by the Sierra Mojada range. Upon the northern slopes of the Sierra Mojada, all of the mineral deposits Sierra Planchada and on the south by the Sierra Mojada range. Upon the northern slopes of the Sierra Mojada, all of the mineral deposits so far discovered in the district are located. The lowest point of the valley (at the town) has an altitude of 4,S25 ft. above sea level. The mountain peaks, which are highest over the slopes where the largest mineral deposits have been found, attain an altitude of 2,500 ft. above the valley, or 7,325 ft. above sea level. The general aspect of the mountains forming the Sierra Mojada range proper is very striking—along the summit a boldly scarped precipice of a general dull gray color alternating with yellowish patches of color, where fresh surfaces have become exposed by recent falls of rock. This precipice, or escarpment, carries about one-third of the total height of the mountain above the valley, and is consequently about 800 ft. in sheer height. The face of the escarpment exhibits many prismatic columnar

about 800 ft. in sheer height. The face of the escarpment exhibits many prismatic columnar forms, a striking peculiarity of the linestone rocks of this region. Below the escarpment the hills are rounded into a series of deep alcoves and projecting buttresses, and are covered with sparse vegetation. East and west of the highest portion of the range, which is about three miles long, the mountains are much lower, the rounded hills extend to the summits, and the sharp lines of the escarpment have disappeared. The general appearance of the Slerra Planchada exhibits the same charac-teristics as that part of the Slerra Moiada last described

general appearance of the Sierra Planchada exhibits the same charac-teristics as that part of the Sierra Mojada last described. The prevailing rock formation of the Sierra Mojada can be observed all over the eastern part of northern Mexico, mainly a magnesian lime-stone of considerable thickness (about 2,000 ft.), including some beds of calcareous sandstone and one horizon (near the bottom of the series) of calcareous conglomerate. Since this rock has been partially metamorphosed, to the almost entire extinction of fossils, its exact geologic age must be, to some extent, a matter of speculation. The fossils that have been found have been classified by Mexican paleontol-ogists as cretaceous, and they have therefore assigned this formation to the Cretaceous period.

ogists as cretaceous, and they have therefore assigned this formation to the Cretaceous period. About one-third of the way up the foothills of the Sierra Mojada are several bodies of altered and decomposed line rock impregnated with ferruginous matter, and coutaining silver and lead bearing min-erals, disseminated in great quantities through this mass or collected deposits. These deposits extend at about the same altitude all along the north flank of the Sierra Mojada for a distance of about 4 miles, everywhere more or less metalliferous, and everywhere presenting the same dominant characteristics of composition, with, however, some variations of strike and dip. These bodies of mineral are much some variations of strike and dip. These bodies of mineral are much softer and more friable than the inclosing rocks, and, hence, have been eaten away more by erosion. The country rock has thus often been left projecting above and below; that below is deeply iron stained in many places, and hence the ore deposits present a distinct outcrop throughout their length.

The minerals found in these deposits are not numerous or varied. Silver occurs native and as chloride, bromide and sulphide, all in small and rare specimens, not to mention its combinations with lead. Copper is found as carbonate (azurite) and very little pyrite. Lead occurs as carbonate, sulphate and sulphide. Sulphur is found native in quite

Is found as carbonate (azimite) and very intice pyrice. Lead occurs as carbonate, sulphate and sulphide. Sulphur is found native in quite large masses, and is generally amorphous. In the early discoveries it was the prevailing opinion that there was no true vein, as only slight traces of regularity of formation were noticed, and these traces were classified as mere attempts at parallelism. Later discoveries have proved that there are two distinct and fairly well defined veins. The copper found in this district is almost en-tirely confined to a distinct vein, having a dip of about 45° to the north, and carrying, in the western part of the known deposits, ores running from 60 to 200 ounces of silver per ton, the grade becoming lower to the eastern part. In the anticlinal contact dipping to the southeast the iron ore is lemnite with pyrolusite and psilomelane without copper res, and with lead carbonates carrying from 18 to 40 ounces of silver, and from 20 to 50% of lead per ton. Especially is this true in the eastern portion of the deposit; but in the western portion the lead decreases to from 10 to 20%, while the amount of silver increases slightly. In the western portion of the known ore deposits, the veins heretofore spoken of are more distinctly defined than in the eastern; heretofore spoken of are more distinctly defined than in the eastern; but in all of the properties which are extensively worked the regu-larity of the deposit is such as to warrant the statement that two distinct veins exist throughout the known mineral zone, and their point of contact or apex is that portion generally lying nearest to the surface.

The metalliferous deposits are found with a covering or envelope of ferruginous clay and disintegrated, iron-stained limestone, some-times impregnated with copper or lead. This mineral belt has been ex-

plored for about 3 miles from west to east, and it is the prevailing plored for about 3 miles from west to east, and it is the prevailing and concurrent opinion of all mining experts who have made a care-ful study of the characteristics of the district that the limits of the mineral belt will be extended beyond the present known lines. The deposits are, as a whole, as might be anticipated, quite soft, and in many cases even loose. The lead carbonates are "sand," solid and massive. The latter layers are the most compact of all, but it is seldom necessary to use powder to extract the mineral. In the early days of the camp no mechanical appliances of any kind were employed excent picks and crowbars: but now the mines are

In the early days of the camp no mechanical appliances of any kind were employed, except picks and crowbars; but now the mines are worked after the most approved methods with improved machinery. I believe no mine has reached a greater depth than 550 ft., but the lateral workings of the San Salvador and Esmeralda mines are con-siderable. The San Salvador is the largest producer, having an ore body about 140 ft. wide, and lateral extent not known. The output of this mine is about 400 tons daily. Then follow, in the order of their tonnage output, Encantada, Esmeralda, San Jose, Vita Rica, La Fortuna, Volcan, and several smaller mines iu process of development and with a nominal output. The average cost of mining and placing a ton of ore aboard the cars is about \$5.80 in Mexican silver. The work of mining is done by contract, the miners earning from 75

a ton of ore aboard the cars is about \$5.80 in Mexican silver. The work of mining is done by contract, the miners earning from 75 cents to \$1.25 per day in Mexican silver; or, at the present rate of exchange, 48 to 80 cents per day in United States currency. The timbermen are mostly American or Cornish and receive from \$3.50 to \$4 in United States currency per day. During the early exploitation of this camp the want of water was most

severely felt, and during the prevalence of the long droughts the people were forced to seek other localities and temporarily abandon the camp.

were forced to seek other localities and temporarily abandon the camp. The serious drawback on continuous work has been partly overcome by the construction of large reservoirs to catch and store the rainfall which, in this section, is abundant generally in May, June and July and occasionally in February. The water thus secured is usually sufficient, with economy, for present needs. In cases of very prolonged droughts the rainfoads can now be relied upon to haul water to camp. At the old pueblo of Sierra Mojada a small supply of water for domestic purposes can be had by sinking wells to a depth of from 30 to 60 ft. With the exception of these wells of limited capacity, no water has been found in the valley, and no determined effort has, I believe, been made to secure any; and hence the problem of water supply sufficient to meet the needs of a large mining center has yet to be solved, either by artesian wells or a more complete and extensive system of reservoirs. system of reservoirs.

The great deposits of lead carbonates that have made this camp so famous, are now so fully developed that conclusions as to the perfamous, are now so fully developed that conclusions as to the per-manency of this district can be drawn from actual conditions of de-velopment work. The ore reserves now in sight are sufficient to in-sure a steady production for the next ten years, if not for a longer period. The possibilities of the extension of the eastern and western limits of the mineral bearing zone are great, and may become a chief factor in the future of this camp. The question of the continuance of the deposits as depth is attained is still open. The deepest work-ings have reached about 500 ft. below the surface. As a rule, at this depth massive iron ore replaces the limestone foot wall and the ore is of lower grade or ceases entirely. Many intelligent miners con-versant with the geologic and mineralogic features of the district be-lieve that when this iron bottom is nierced a second contact will be lieve that when this iron bottom is pierced a second contact will be found more valuable than the first. It is also recognized as possible that the ores at the second contact will be refractory and will replace the valuable product that has made Sierra Mojada ores so desired by metallurgists.

An average analysis of lead ores of this camp will show about as blows: Lead, 30%; silver, 35 ounces; iron, 15%; silica, not to exceed follows: Lead, ov 70, 5%, and balance lime.

5%, and balance lime. Prior to the present United States tariff the output of the entire district was exported to the United States, save the relatively small tonnage smelted directly at the camp by the Esmeralda furnace, the only one in camp. Under the former tariff Slerra Mojaca ores en-tered the United States free of duty, as the silver component exceeded the lead in value. Under our present tariff silver-lead res pay a duty of 1½ cents per pound upon the weight of the lead; or lerwise the duty is levied on gross tonnage at \$30 per ton. In consequence of this change of tariff, all ores exported from Mexico to the United States are either dry ores (silver) or silver-lead ores in which the value of change of tariff, all ores exported from Mexico to the United States are either dry ores (silver) or silver-lead ores in which the value of silver exceeds that of the lead. Upon this last class the average duty (upon an average of 30% of lead to the ton, or 600 pounds) is \$9 per ton. The effect of the change in the tariff on Mexican ores has been to shut out ores high in lead and low in silver, and to cause export shipments to be graded to a higher silver average per ton. This results in a decreased tonnage exported to the United States, but at the same time in an increased value of ore. It is estimated that the Sierra Mojada district will export to the United States during the present fiscal year (July 1, 1892, to June 30, 1893) upward of 70,000 tons of ore, upon which duties will approxi-mate \$630,000.

PETROLEUM IN THE ARGENTINE REPUBLIC.

At Cachenta in the province of Mendoza in the Argentine a con-At Cachenta in the province of Mendoza in the Argentine a con-siderable petroleum industry has sprung up during the last two years. In this district there is a promise of great mineral wealth, but as yet it has been worked only in a desultory manner. There seems to be a future before the petroleum industry. Up to the present time three successful borings have been made and the total output since the first boring in April, 1890, has been 1,500 tons. The oil is conducted through pipes to the storage tanks at San Vincente. It finds a ready sale at the Rio Cuarto and Mendoza gas works and at the Argentine Great Western Railroad. This railroad has twelve locomotives which use the oil as fuel.

THE VOLUMETRIC DETERMINATION OF SULPHURIC ACID.

THE VOLUMETRIC DETERMINATION OF SULPHURIC ACID. In the "Zeitschrift fur Analytische Chemie" Mr. Farnsteiner describes a new method of estimating small quantities of sulphuric acid in soda, common salt, potash, potassium, chloride and water. The solution to be tested is first slightly acidified with hydrochloric acid and heated almost to ebullition; then it is precipitated with a measured excess of a solution of barium chloride of known strength. After it has been heated for some time longer, anmonia free from carbonic acid is added until the reaction is faintly alkaline. Then the excess of barium chloride is precipitated by means of a measured volume of potassium chromate of known power of reaction. When cold the liquid, which then contains only a slight excess of potasslum chromate, is transferred along with the precipitate into a suitable flask. The flask is filled up and well shaken up, and after the precipitate has subsided, half the liquid is filtered off. It is then mixed with potassium iodide and hydrochloric acid, either in a beaker or in a wide-necked flask capable of being closed with a glass stopper. After some minutes the eliminated iodine is determined with a solution of sodium thiosulphate. For the calculation, the strength of the solution of barium chloride must be exactly known; also the relation of sodium thiosulphate. This pro-cess does not give good results with large quantities of sulphuric acid as both the barium sulphate and the barium chromate carry down pctassium chromate. petassium chromate.

CUTTER'S MINE SOCKET FOR INCANDESCENT LAMPS.

It is unfortunately the case that some of the so-called waterproof sockets, which have been devised, do not meet the socket waterprior sockets, which have been devised, do not meet the necessities of the case. While apparently shielding the works of the socket from drip-ping water, they do not prevent the moisture from creeping up on the lamp and short-circuiting the cap. The result is that the fuses are blown much too often, thus leaving the men in darkness unless they have other lamps at hand.



CUTTER'S MINE SOCKET FOR INCANDESCENT LAMPS.

These defects in the ordinary rubber, glass or porcelain sockets have been considered in developing the socket shown in the accompanying illustration. This has a well built interior (with porcelain insulations) protected by a casing of polished hard rubber. The leading-in wires are cemented into the shell, while the handle or key passes through a bushing which is made watertight by soft rubber washers. These prevent any moisture from entering the shell at the sides, so that the only danger is from the creeping of the water along the bulb of the lamp. To avoid this, the shell has a series of soft rubber rings which press against the bulb of the lamp when screwed into place and pre-vent any moisture from reaching the lamp base. It is said that such a socket can be used with safety in places where there is a steady dripping of water, and that it can be entirely immersed without any danger from short-circuits. When used in mines, it is furnished with a prong, as shown, so that it can be hooked in any convenient position. This socket, which is shown in the accompanying illustration, is This socket, which is shown in the accompanying Illustration, is made by George Cutter, of Chicago. It has been furnished by him to several mines in northern Michigan, where it is now in successful use.

The Mummy of a Cliff Dweller.—Prof. Clement L. Webster, of Iowa, has returned from extended explorations of the ancient cliff dweller ruins of Mexico and New Mexico. He has made many valuable disruins of Mexico and New Mexico. He has made many valuable dis-coveries regarding these strange people, and has secured many relics from their ancient dwellings. His most important discovery, how-ever, was that of a perfectly preserved mummy of a cliff dweller. It is that of a child apparently seven years old. It was discovered in a cliff dwelling on the Rio Gila in the Mogollon Mountains. The body is rather small compared with that of a modern child of the same age. The body is of a yellowish brown color, and is rather light in weight. Its arms are upraised near the sides of its head, its hands are clinched, and its legs somewhat drawn up. The body had been carefully wrapped in two varieties of coarse cloth, such as was made by the cliff dwellers everywhere in this region, then carefully bound on a peculiarly shaped board of cottonwood.

GRADUATES OF MINING SCHOOLS.

Written for the Engineering and Mining Journal by Prof. Samuel B. Christy.*

In a late series of articles on "The Engineering Schools of the United States," the editor of the "Engineering News," in the number for October 6th, 1892, takes occasion to criticise, as very ill advised, the courses of Instruction of the American mining schools. These criti-cisms have been ably and forcibly answered by Professor Munroe, in the numbers of the same journal for November 3d and 24th. In commenting on Professor Munroe's last article, the editor "admits its abstract force," and adds, "Our opposite impressions were based only on a count of noses in 1890." The editor bases his principal criticism on the small number of gradue

The editor bases his principal criticism on the small number of gradu-ates from the mining schools, and, particularly, the small rate of in-crease in their numbers. Thus the number of graduates from all the engineering schools was:

	Mining	Mechanical	Civil Engineering.	
1880	37	41	157	
1892	48	445	371	
Increase	1 ^{•3} times.	10°8 times.	2°2 times.	
1	7 10 1			

This would appear to be, at first sight, a very bad showing for the mining schools, particularly, as the writer adds, while the mining industry is growing enormously. Now, according to the latest report of Major J. W. Powell, director of the H.

the U.S. Geological Survey, the exact figures are as follows:

Non-metallic mineral products	Year 1880.	Year 1891.	Increase.
	\$173.279.135	\$356.216.615	2:06 times.
Metallic product	190,039,865	302,3' 7,922	1.60 "
Estimated value unspecified	6,000,000	10,000,600	1.66 "
Total	\$369,319,000	\$668 521 537	1.81 times.

In the light of these figures the Increase, 1.3 times, in the number

In the light of these figures the Increase, 1.3 times, in the number of graduates from the mining schools, appears remarkably close to the increase, 1.81 times, in the total value of the annual mineral product of the country for the corresponding decade. In fact, no one would have ventured to predict such a close agreement beforehand. The increase in the number of graduates from the civil engineering schools is probably very nearly in proportion to the natural growth of the country, though there are some indications that the supply already begins to exceed the demand. With regard to the enormous increase in the number of graduates from the schools of Lechanical engineering, it is certain that a great part is due to a legitimate demand, although much is probably due to the excited state of the public mind on the subject of electrical engineering. No one can safely predict the outcome in that direction at present, though it is likely that many young men with great expectations are doomed to disappointment.

question, I have endeavored to ascertain the actual distribution of the wage-earning occupations in the entire country. Unfortunately the eleventh census is not yet in a shape to make its figures on the whole subject available. The tenth census—up to 1880—gives results as follows:

near a

as may be rearried from this report, the re	nio wina	result.
Engineers, surveyors, etc [probably in excess] Mining officials Chemists, assayers, metallurgists, etc	4,000 4,000 1,969	
Stamp mill operatives	1,449	9,969
Miners Quarrymen	234,238	250,846
Grand total for the United States		260,815

or just 1'50% of all the wage earners in the country.

Now, the number of openings from the engineering schools ought to Now, the number of openings from the engineering schools ought to bear some relation to the total number of persons engaged in the in-dustries most nearly allied to their work. Civil engineers get most of their work from the class "Trade and Transport," which occupies 10.41% of the total wage-earners. The agricultural interests certainly offer some work in land surveying and irrigation work, but most of it is in the line of the civil engineers, and is done by them. Deducting 1.50% occupied with mining, manufactures and mechanics occupy 20.56%. Hence these occupations are numerically related as follows: Employed in mining, ratio, 1.00; in trade and transport, 6.94; in manufactures and mechanics, 13.71. If now we compare the number of graduates from the different

manufactures and mechanics, 13:71. If now we compare the number of graduates from the different engineering schools for the year 1892, we shall find them related as follows: Graduates from mining schools for 1892, ratio, 1.00; from civil engineering schools, 7:73; from mechanical engineering schools, 9:27. It would seem from these figures, unless the relative proportions of the wage-earning classes has essentially altered in the last ten years, since this census was taken, that the supply of civil engineers was still some-what below it. It will not do to push such conclusions too for but

what below it. It will not do to push such conclusions too far, but the comparison is certainly instructive in this connection. Further, it must be remembered that students will hardly be ex-pected to take a long and difficult engineering course to prepare for

* Professor of Mining and Metallurgy in the University of California.

as all the miners in the entire United States. In order, however, to run this matter down to the end, I have com-piled from the volume on "Mineral Industries" for the eleventh census, which has just appeared, the following statistics for the year 1889: Wage Earners Connected with the Mineral Industry.—Employed in the office, 6,683*; foremen above and below ground, 15,828[†]; total,

22.511; mechanics, 45.217; miners, 244,022; laborers, 200,112; boys, 30,-927; grand total, 542.789.

The questions naturally arise, What is the annual number of openings for the graduates of our mining schools in the United States? and what is the relation between the supply and the demand?

is the relation between the supply and the deniand? We have seen that in 1889 there were 6,683 persons engaged "in the office" and 15,828 engaged as foreman, or 22,511 in all engaged in the whole mining industry. Of this total number at least half were engaged in superintending the work of mechanics and laborers, or in clerical or other capacities connected with accounts; this would leave 11,255 efficiency accounts with the minor. The theory engaged in superintending the work of internatics and above, of in clerical or other capacities connected with accounts; this would leave 11.255 officials connected with the proper work of the miner. To those who are familiar with mining work it must be evident that not over half of these would find the technical instruction of a mining school necessary for the proper performance of their duty, or we find say about 6,000 persons in the whole country who may be said to need a technical education for the proper performance of their mining duties. As a corroboration of this estimate, the membership of the American Institute of Mining Engineers may be cited. The liberal basis on which membership of this society is founded insures a very large membership of those interested, as compared with other engineering societies. In 1891 it had 14 honorary members, 1,914 members, and 164 associates, or a total in the United States of 2,092. This is one-third of the number estimated above as the total for the whole country interested in the technical control of the mining industry proper. Now an average age of 25 may be assumed as that at which a man would be fitted for a position of technical responsibility; at this age the natural life of a man is estimated to be 38 years; and if we assume an average working life of 30 years, we have as the average number of

average working life of 30 years, we have as the average number of vacancies per year about 200. It will be evident now that the number of graduates turned ont by

the mining schools in 1892, namely 48, is not so extremely out of pro-portion to the number of openings as has been assumed in all the dis-cussion on this subject; more especially as all the mining schools give a partial education to fully three times the number who graduate. Making allowance for the number of all who are educated more or less by them, for those who do not choose to follow the profession, and for those who practice it in foreign countries, it must be evident that there are about four or five times as many openings as there are unining students to till them. This is a condition of things which agrees very well with experience and shows why there is such a steady demand

for the gradnates from the best mining schools. They are at present reasonably sure of good and remunerative posi-tions; if in addition to the proper sort of training they have the peculiar temperament (including energy, facility for detail, and execu-tive ability) essential for success in any branch of engineering, and especially in mining, where all a man's resources are put to the extreme test.

These qualities, though they may be cultivated, are largely a matter

of inheritance, and if a man does not possess them he would do better not to attempt mining as a profession. It must be evident to any candid mind that criticism of American min-ing schools, based on the number of their graduates, is without sub-ctantial foundation. stantial foundation.

It may be said, however, if the demand for such graduates is limited, not involving more than a couple of hundred a year, why maintain these expensive schools?

not involving more than a couple of numbred a year, why maintain these expensive schools? The answer, on a mere commercial basis, is not far to reach. The annual actual money value of the product per capita of the labor of the principal producing industries for 1880 was as follows: Agricul-tural, \$280; manufactured, \$1,493. Deducting, say, one-third for value of raw material, we have a net increase of value, produced by labor of \$996. The value of mining product per capita was \$1,416. It is evident, therefore, that in spite of all the risks connected with mining, the value of the product per capita is greater than that pro-duced as the result of any other industry. Counting the miners only, for 1889, the product per capita was \$2,407; and counting all engaged, including officers, mechanics, laborers and boys, it was \$1,082. It must be plain, therefore, that anything which tends to produce a still further increase in the producing power of the miner, either in making productive large bodies of low grade ores, or in increasing the net profit of his labor, must be of vital Importance to the entire com-munity, more especially as the miner produces the raw material from which the whole web of modern civilization is woven. It is idle to deny that the best American mining schools have an im-

'In making up the total number employed at the "office," there were a number of the smaller industries, in which this item was left blank in the returns; in these cases I have added half the number reported in each such case as foremen. These additions amount in all to 142. The statistics for the mineral industry for the eleventh Census show a remarkable improvement on those which precede it for the special ru pose of this inquiry. It does seem remarkable, however, that our census officials have never thought in necessary to ascertain definitely the artual number of mechanical, civil, mining and metallurgical engineers and chemists in the court ry. Their total number is less than that of the clergymen, lawyers and phy-sician, but their influence on the development of the physical resources of the country is probably greater than all these put together.

+ About equally distributed above and below ground.

portant infinence through their gradnates in increasing the useful apportant infinence through their gradinates in increasing the useful applications of geological, physical and chemical science and engineering art to the extraction of ores from the earth, and to their economic ntilization. It is further true that the civil and mechanical engineer, as such, are not properly equipped to meet the problems as they actually present themselves to the mining engineer.

It must be admitted that there exist more mining schools than there present need for. It would undoubtedly be better if their number is present need for. was limited to perhaps half a dozen, whose equipment, endowment and location were such as could best serve the needs of the com-munity in which they were placed. Natural selection will undonbtedly which no community will long maintain unless It is felt to be a necessity.

THE PERSISTENCE OF ORES IN LODES IN DEPTH-THE EMPIRE LODE.

Written for the Engineering and Mining Journal by H M. Beadle.

Written for the Engineering and Mining Journal by H M. Beadle. Without making any claim to be an engineer, only claiming to have a theoretical knowledge of mining and the allied sciences, I send you a few words on the subject treated in the issue of January 7th, 1893. While the theory of the mineralization of lodes by "lateral secretion" or the endosmotic flow of water may be generally accepted, I do not believe that the evidence so far justifies the conclusion arrived at. 1 have been inclined to be led in the matter of the mineralization of veins by the opinions of the late Prof. J. E. Clayton, one of the most original thinkers and careful investigators of the West, who had care-fully studied the vein formations of the Rocky Monntains. His opinion was that fissure veins were mineralized by water being forced up from great depth by heat. In this water minerals had been dis-solved, and in rising, they followed the more open parts of the veins, and in doing so dissolved the rock with which the fissure was filled, and on cooling the minerals held in solution were precipitated. In his report on the Drunlummon vein at Marysville, Mont., owned and worked by the Montana Company, Limited, he sustained his theory by such facts and arguments that it may be said that it was demonstrated to be true as to that vein. In the lode formations at Butte, Mont., Mr. Blake thinks he sees evidence of "lateral secretion." He says that "at the greatest depths reached in the Butte granite there are signs of the alterations of granite contiguous to the lodes, and in some places there are evidences of

evidence of "lateral secretion." He says that "at the greatest depths reached in the Butte granite there are signs of the alterations of granite contiguous to the lodes, and in some places there are evidences of active oxidation far below the usual horizon of the oxidized ores at and above the permanent water level." All this is true, and it is no doubt true that this action is due, as he says, to water, but it by no means follows that it is due to the "endosmotic flow." of water "through the invisible pores of rock inward to fissures." It probably proves that the water, flowing through the fissure from below, had penetrated the wall rock and left "evidences of active oxidation." Professor Clayton found that portions of the Drumlummon vein had been compressed so hard and tight by the weight of the hanging wall that no water could penetrate it, and that in those portions the walls were well defined, and the rock which filled the lode was of the same character as that of the walls, but where the condition of the vein was such as to permit the water to pass freely throngh it, not only were the rocks which were within the lode previous to its mineralization dis-solved out and metal bearing quartz deposited in their places, but the walls themselves were attacked in many places and changed so that there was no defined wall. The same effect is seen in the walls of many Butte lodes. Is it not more probable that such effects were produced by the large quantity of water flowing through the invisible pores of rock inward to fissures?" Occasionally, however, lodes are seen that seem to have been mineralized in some way unknown and uncomformably to any theory heretofore advanced. Such a lode is the Empire, owned by the Golden Leaf Company, of London, and located abont a mile and a half west of Marysville, Mont. The lode is ln magnesian slate, which is the bedded rock of that region. About half a mile southwest of Marysville is the center of a granite intrusion abont a mile square with dykes running south and northwest. On

The lode is in magnesian slate, which is the bedded rock of that region. About half a mile southwest of Marysville is the center of a granite intrusion about a mile square with dykes running south and northwest. On the north and west of this granite the slate has not been disturbed to any great extent, but on the east and sonth the slate is lifted until some of it is almost perpendicular. This slate is of great thickness; some claiming that its edges show up for a distance of nine miles east of Marysville. At the Empire lode, the slate is massive and is evidently of great thickness. The strike of the Empire lode, which is believed to be a true fissure, is east and west, and its dlp to the south. North of it, about 1,000 ft., is the Whippoorwill lode, and south about the same distance, across Coomb's gulch, is the Puritan. The Empire and Whippoorwill are gold lodes, but the Puritan, so far as explored, is richest in silver. The Empire lode, or that part of it covered by the Smithville and Empire claims, is worked out to the 400 level, and the pay ore exhausted. There is a claim on the lode, east of the Empire, on which but little work has been done. The vein is well worked on the surface and at the east seems to penetrate Belmont Mountain, a spur running north from the main chain of the Rockies. In the Smithville claim the lode gradually curves to the northwest, and at its furthest western development is small and of little importance. The distance between the walls is about 9 ft. on an average. The walls are well defined throughout. Two winzes have been sunk to the depth of 100 ft. each from the 400 level, one toward the east end of the Smithville and one on the Empire claim, and drifts were run east and west, but no ore that would pay to break was found. Many cracks and small crevices penetrated the walls, the greater number of which were filled with barree quartz, but a few very small ones were filled with rich ore, which would not, however, pay the expense of following them.

pay the expense of following them. The quartz, even in the richest parts, was mixed with broken pieces of the slate wall rock. There were cracks through the quartz

itself, showing that, in all probability, the vein had been opened after the quartz had been deposited, and the cracks thus made were then tilled with ore very rich in gold. No gold was found in the wall rock in the vein. The lode was mineralized to the greatest extent at the in the vein. The lode was inheralized to the greatest extent at the surface. Ore was found in the west end of the Empire and the cast end of the Smithville, though there was no well defined shoot. Two ore-shoots were found in the Empire claim, one dipping east about 200 ft. long horizontally, and the other, the richer one, dlpping west about 120 ft. long horizontally. The east end line of the smaller shoot and the west end line of the larger one met 1,000 ft. east of the west line of the Empire. It was at this point the eastern winze was sunk. Between the east end of the larger shoot and the west end of the smaller one on the surface was about 300 ft. of barren ground. ground.

ground. Two large masses of very rich ore were found in the Empire claim, between the 200 and 300 levels. They lay horizontally, the top of each about 30 ft. below the 200 level, and the bottom of each about 15 ft. above the 300 level. There was about 20 ft. of barren ground between them; the west one was about 80 ft. long, and the east one 10 ft. shorter. The character of the ore was the same as that in the other shoots, the richest portions being on the hanging wall. The year matter all around these two shoots of ore was barren, and there was nothing to chow from where the mineralizing agent which devein matter all around these two shoots of ore was barren, and there was nothing to show from where the mineralizing agent which de-posited the gold in these places came. These isolated bodies of ore lay in the east end of the Empire claim, the west end of the larger one being 1,300 ft, from the west line of the Empire. This vein could not have been mineralized by lateral secretion, for so far no gold whatever has been found in the slate wall rock. While a few small cracks were found to have been mineralized along the 400 level, and in the winzes and drifts from them, it is not believed that they were fulficiently large even if continuous to have mineralized

400 level, and in the winzes and drifts from them, it is not benever that they were sufficiently large, even if continuous, to have mineralized the large portions found above. The mountains here have been de nuded a thousand or more feet, but if that portion of rock which lay above the present surface had been mineralized, it is very probable that the country rock at the present surface would have carried some gold also.

When that portion of the lode lying east of the Empire has been worked, it is possible some explanation of the manner in which it was mineralized may appear, but the lode at the east end of the Em-pire claim along the middle depths was barren. The facts here given were obtained from Mr. Frank Longmaid, the

efficient assistant manager of the Golden Leaf properties.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Eighth Circuit Court of Appeals of the United States .- Caldwell, Circuit Judge.

Mineral Case—Exclusion of Evidence of Apex—Charging Jury in Absence of Counsel—Construction of Patent—Lode Within Side Lines as Against Junior Apex Discovery—Court Fixing Amount of

Lines as Against Junior Apex Discovery—Court Fixing Amount of Land Recovered. 1. Where, therefore, in an action of ejectment to recover possession of a mining lode the issue raised by the pleadings was whether the plaintiff was the owner and entitled to the possession of a lode having its apex within his claim after the same had passed under the side-lines of an adjoining mining claim of defendant: Held, that in sup-port of the negative of that issue the defendant had the right to show that plaintiff's alleged vein, or lode, was not a separate vein, but simply one of numerous ore channels, which together formed one broad lode having its apex partly in plaintiff's claim and partly in defendant's claim; or, failing in that contentiou, that defendant had the right to show that both parties had the apex of independent veins, which in their descent became united underneath defendant's claim, and that the defendant was entitled to the vein from the point of junction downward, because it was the owner of the oldest patent; and, held, further, that as the action was in ejectment both of the defences might be allowed although they were inconsistent.

a own wird, because it was the owner of the ordest patcht, and, held, further, that as the action was in ejectment both of the defences might be allowed although they were inconsistent.
2. The trial court having taken a contrary view and having ruled that both defences were not permissible, and having refused to permit the jury to determine whether there were separate veins which in their descent became united underneath defendant's claim: Held, that the error was immaterial, for the reason that the evidence was insufficient to support a finding by the jury that there were separate veins, one of which had its apex within plaintiff's claim, and the other within the side-lines of the defendant's claim.
3. Sec. 2,322, R. S. U. S., conferring the right to follow a lode outside of side-lines of a location, when the apex at the lode lies within the boundaries of the location does not in terms, or by implication limit the exercise of that right, especially when mining claims are involved, to cases where the adjoining claims are held under junior locations or patents. Pae. Coast Mining & Milling Co., 16, Fed. Rep. 348, and Amador-Medean Gold M. C. v. South Spring Hill Gold Mining Co., 36, Fed. Rep. 668, distinguished.
4. Plaintiff's mining elaim (Allunde) adjoined the Colorado Central claim of defendant on the south. Defendant had discovered on the Colorado Central elaim at least 600 ft. northeast of the disputed territory, in suit, a vein on which the Colorado Central location and patent

Colorado Central claim at least 600 ft. northeast of the disputed terri-tory, in sult, a veln on which the Colorado Central location and patent apparently rested. This veln forked as it entered the disputed territory, and the apex or outcrop of one of the forks, viz.: of the fork on which the Aliunde location rested, had departed from the Colorado Central side-lines, and was within the Aliunde location, though, by reason of the dip, a portion of the fork of the vein was still under-neath the Colorado Central claim. In view of this state of facts the trial judge was asked to instruct the jury in substance that the pro-prietor of the Aliunde claim was not entitled to recover his vein under the Colorado Central claim (the latter being under the oldest patent) if the jury believed the Aliunde lode "to be a part of the same lode as that on which the Colorado Central patent issued," which instruction

the trial court refused: Held, that if the vein on which the Colorado Central location rested became divided as it entered the disputed territory and the outcrop of one fork crossed into the Aliunde territory, then it followed that the Colorado Central claim had been laid rather obliquely to the course of the outcrop, in which case the defendant lost that fork of the vein that had passed outside of its side-lines, and that, so far as that fork was concerned the S. end of the line of the Colorado Central elaim must be regarded as a line drawn through the point when the outcrop passed through its south side-line, and that, therefore, there was no error in the refusal of the instruction asked. 5. When in an action of ejectment for a mining lode, or vein, the complaint accurately describes the premises in dispute, and the jury find that plaintiff is "the owner in fee of the lode and premises de-scribed in the amended complaint and is entitled to the occupation and possession thereof" such verdiet is sufficiently specific, and the objection that it does not define the boundaries of the disputed territory is unten-able. Case of the Colorado Central Mining Co. v. Turck. (Opinion of Thayer, Dist. Court I., Sept., 1893.)

THE COCHRANE SEPARATOR.

The accompanying illustrations show the Cochrane Separator, Figs. 1 and 2 being sections on different lines, showing the vertical style of this device. The chief point is the angular baffle-plate, with its ribbed upper and lower faces; this is designed to receive the impact of a curupper and lower faces; this is designed to receive the impact of a cur-rent of steam, either ascending or descending, and by it the separated particles are thrown to one side, away from the passage left for the purified steam. The pipe projecting upward in the separator is virtually a continuation of the main line and forms the receptacle or well for the separated particles (water, oil, grease, grit, etc.). The umbrella-shaped projection at the top of this pipe is designed to contract the mouth of the well so as to prevent interference with the contents thereof



This separator, which is reported as working very well in practice, is made by the Harrison Safety Boiler Works, Germantown Junction, Philadelphia.

The Latest Armor Tests.—A test of a new nickel-steel armor plate treated by the Harvey process was made at the Indian Head proving grounds on February 11th. The object was to determine the tests to be established for the 7,000 tons of armor for which contracts are soon to be let. The test was to include shots at low velocity to show whether the plate would break or crack, and at high velocity to test the resistance to penetration. The plate in this trial was 9×7 ft. In size and 14 in. thick, and was the thickest plate yet submitted to test. The arrangement of the gun from which the shots were fired and of the backing were the same as in previous tests. The first shot was fired with a charge which gave a velocity at the point of impact of 1,472 ft. per second. The projectile entered the plate about 5 in. and broke in fragments; no crack could be found in the plate. The second shot, with a velocity at the point of impact of 1,860 ft., entered the plate about $6\frac{1}{2}$ in., and cracked it for a part of its length. The third shot had a velocity at impact of 1,960 ft., and the result was almost the same as with the second. The fourth projectile, with the high velocity of 2,060 ft., entered the plate about 10 in., cracking it in several directions, and breaking the backing. The tests were considered very satisfactory.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office: TUESDAY, FEBRUARY 14TH, 1893.

Horse Power. Emmett H. Condit, Outville, O. Process of Manufacturing White Lead. Paul Bronner, Stuttgart, Ger-491.528. 191,325. Horse Power Enhancer H. Condit, Outving, O. 191,325. Horse Powers of Manufacturing White Lead. Paul Bronner, Stuttgart, Germany.
191,638. Process of Manufacturing White Lead. Paul Bronner, Stuttgart, Germany.
191,639. Process of and Apparatus for Obtaining Metals from Their Ores. Samuel H Cochran, Everett, Mass., Assignor to the Cochran Gold and Silver Releasing and Steam Generating Company, of Maine.
191,630. Ore Dressing Apparatus. Wilhelm J. Bartsch, Dresden, Germany.
191,636. Ore Amalgamator. Fred. O. Norton, Clinton, Ia.
191,700. Method of Electrolytically Producing Soda and Chlorine. Elisha B. Cutten, New York, N. Y.
191,701. Method of Electrolytically Producing Potassium Chlorate. Elisha B. Cutten, New York, N. Y.
191,701. Method of Electrolytically Producing Potassium Chlorate. Elisha B. Cutten, New York, N. Y.
191,701. Method of Galvanizing Iron. Gustave Retterer. Paris, France.
191,741. Apparatus for Volatilizing Ammonium Chloride. Ludwig Mund, North wich, Scotland.
191,558. Bucket Dumping Apparatus. Frank B. Wineland, Breckenridge, Colo =

PERSONALS.

Mr. William H. Radford, mining engineer, has gone to Ecuador, South America, on professional business.

Mr. George H. Pegram, who succeeds Col. Eben C. Smeed as chief engineer of the Union Pacific, has been constructing engineer of the Utah & Northern and the Missouri Pacific; he was also with the Edge Moor Bridge Works for a time, and has recently had an office in St. Louis as a consulting engineer.

OBITUARY.

John F. Duun died at Ocala, Fla., on the 12th inst. He was largely interested in the Florida phosphate industry, in which he was a pioneer.

John Inshaw, of Aston, England, died January 27th, beiug 86 years old. He was a contemporary of Stephenson, and elaimed to be the inventor of the steam pressure gauge. Among his acknowledged inventions are twiu-screw propellers and the injector for filling boilers.

Josephus Collett, who died at his residence in Terra Haute, Ind., February 13th, aged 68 years, was actively interested for many years in the development of Western Indiana. He built, about 1870, the Evansville, Terre Haute & Chicago road, which has since become part of the Chicago & Eastern Illinois line. He was interested in several coal properties in the Indiana district, and also in coal mining in the Hocking Valley, in Ohio, where he built the Sunday Creek branch of the Columbus & Hocking Valley road to give access to his mines. Mr. Collett was one of the richest men of his State.

men of his State. John M. Robinson, who died in Baltimore, February 14th, was born in Philadelphia in 1835. He graduated from the Virginia Military Institute, and received a careful training as a civil engineer. During the war he served in the engineer corps of the Confederate Army. Later he held important positions on the Seaboard & Roanoke, the Raleigh & Gaston and the Richmond, Fredericksburg & Potomac roads, finally succeeding the late Moncure Robinson as president of those companies. Mr. Robinson was for many years actively employed, and did much to aid in the industrial development of the South, especially in the direction of railroads and coal mining.

of railroads and coal mining. William Holms Chambers Bartlett died at Youkers, N. Y., February 11th, aged 88. Mr. Bartlett was born on September 4th, 1804, and entered West Point in 1822. Four years later he graduated at the head of his class. In 1827 he was made assistant professor of engineering of that school, and in 1836 professor of natural aud experimental philosophy. In 1871 he was retired from West Point, at his own request, and became actuary of the Mutual Life Insurance Company, which position he held until 1888. Professor Bartlett was the author of a number of scientific textbooks, the most important being "Treatise on Opties," "Synthetical Mechanics," "Analytical Mechanics" and "Spherical Astronomy."

chanics" and "Spherical Astronomy." William T. Carter, a prominent coal and iron operator, died at his home in Philadelphia, February 9th, of pnuemonia. He was born in Cornwall, England, in 1827. Coming to this country in 1850, he entered the employ of his uneles, John and Riehard Carter, who were pioneers in anthracite miuing in the Schuylkill region. In 1861, from his earnings, he purchased the Coleraiue collieries in Carbon County, and has since operated them with great energy and success. In 1867 he purchased ground on the Lehigh Valley Railroad, below Bethlehem, and started a town, giving it the name of Reddington. Here he erected two large blast furnaces and machine skops, which have been kept in constant operation. In 1860 he moved to Philadelphia and became identified with street railway enterprises and with many of the fiscal institutions of the city. He was a member of the American Iron and Steel Association. He was a steady worker and a careful man, and left a large estate.

SOCIETIES.

At the meeting of the Western Railway Club in Chicago, February 21st, Mr. G. W. Rhodes' paper on "Wheel Flanges," read at the January meeting, will be discussed; and a paper will be read by Mr. William Forsyth on "Tests of Locomotives in Heavy Express Passenger Service."

The Lake Superior Mining Association will hold its first annual meeting at Iron Monntain, Gogebic Range, Mich., on February 2d. This association is composed of the mining men generally on the Gogebic and Menominee ranges, and Mr. T. Park Channing was largely instrumental in its formation.

The American Society of Civil Engineers, at its meeting on February 1st, heard papers read by Mr. Robert Cartwright on the "Power House of

the Rochester Power Company," at the Genesee Falls, where 1,200 HP. is generated by two Heffel turbines; and by Mr. James Duane on the "Effect of Tuberculation on the Delivery of a 48-in. Water Main." Both papers were briefly discussed.

Main. Both papers were briefly discussed. At the annual meeting of the Engineers' Club, of Philadelphia, on January 21st, the board of directors reported that the club had been duly charter.d. It has now 457 members, of whom 276 are resident and 181 non-resident. The receipts for the year were \$6,377, the expenditures \$6,078 and the cash balance \$299. The following officers were declared elected: President, John Birkinbine; vice-president, James Christie; treasurer, F. Carpenter Smith; secretary, S. F. Rondinella; directors, Henry J. Hartley, John L. Gill, Jr., and W. B. Rieguer. The club voted to approve the act establishing a forestry commission, and to recommend its passage.

At the recent meeting of the Civil Engineers' Club of Cleveland, Dr. John W. Langley, of Case School of Applied Science, read a paper on "Some Physical Properties of Steel as Related by Its Structure and Composition." He said: Steel is defined as a solution of several elements in iron, the principal elements being carbon, silicon, phosphorus and manganese. Limitations of the scope of the definition to "high steel" are given. Then follows an explanation of the terms combination and solution, and reasons given for considering steel to represent the latter rather than the former. The influence of the above four elements on the fusibility and hardness, the toughness and the disposition to crack, are given by a set of curves showing the relation between the property in question and the quantity of the added elements. The subject of the hardening and anmealing of steel is then discussed, and the phenomenon of recaliseence illustrated by graphical eonstruction.

struction. The regular monthly meeting of the Civil Engineers' Soeiety of St. Paul was held February 6th. It was unanimously resolved that the United States senators and representatives in Congress for the State of Minnesota, also the chairmen of committees to which has been referred the bill appropriating \$40,000 for the continuance of the United States timber tests by the Forestry Division of the Agricultural Department be advised, by the president and secretary of this society, of the farreaching benefits to the public and to the engineering profession which, in the judgment of this society, the passage of this bill would procure. A paper on "Railroad Building in Mexico" was read by Mr. W. H. Wood. At present nine-tenths of Mexican imports enter via Vera Cruz. This port has no docks. All traffic must be pieced out by lighters. The recent harbor improvements at Tampico and the proposed direct line of railway to that port from the City of Mexico will probably divert much traffic to the new route. Deep water, docks, climate, railway grades and facilities, will all be in favor of Tampico.

chinate, railway grades and facilities, will all be in favor of Tampico.

INDUSTRIAL NOTES.

The Roanoke Machine Works, Roanoke, Va., are building 560 coal cars for the Norfolk & Western Railroad.

The works of the New Jersey Steel and Iron Company, at Trenton, N. J., were compelled to shut down on the 11th inst. on account of a flood in the Delaware.

The American Bridge and Iron Works, Roanoke, Va., have a contract to furnish 1,500 tons of frouwork for the Matthison Alkali Works, at Saltsburg, Va.

Furnace E., of the Crane Iron Company, Catasaqua, Pa., has shut down, throwing out of employment a large number of men. It is said that another stack will shortly be blown out.

The Reading Rolling Mill Company, of Reading, Pa., on the 11th inst. posted a reduction of wages to take effect January 16th. Puddlers are reduced from \$3.50 to \$3 per ton, and the other hands 15%.

According to the "Grashdanin," the Russian committee has under consideration the question of authorizing the importation of 1,125,000 poods, equal to 20,200 tons, of unmanufactured pig and cast-iron free of duty.

The West Duluth furnace of the Minnesota Blast Furnace Company is running now on all Mesabi ore. The only trouble is due to the fineness of the ore, as some of it blows into the downtake, otherwise the furnace works well.

The smoke and fog question is being agitated by the Loudon "Coal and Iron." The paper advocates the voluntary use of anthracite by public institutions and others, at the same time aeknowledging that its compulsory use is impossible.

The E. P. Allis Company, of Milwaukee, is putting in new blowing engines at the Lucy furnaces, in Pittsburg. The steam cylinders are 42×60 in., and the air cylinders 84×60 in., the latter having positive inlet and outlet valves.

The Westinghouse Machine Company, in Pittsburg, has finished and tested the first of the six 1,000-HP, compound engines which it will send to the World's Fair. The engine is intended to run at 200 revolutions per minute, with 150 lbs. boiler pressure.

The Harrisburg Foundry and Machine Works, Harrisburg, Pa., have turned out much work lately, including some large engines for the Broadway Cable Road station, in New York. Two tandem compound engines have lately been sent to Porto Rico and two to Australia.

The Yale & Towne Manufacturing Company, Stamford, Conn., recently put up a 20-ton traveling crane in the shops of the Maryland Steel Company, at Sparrow's Point, Md. The bridge of this erane has 56 ft. span, and travels on tracks 25 ft. above the shop floor. There are three separate motors for hoisting, trolleying and moving the bridge. The crane is used for handling the parts of heavy marine engines.

At the annual meeting February Sth, the following directors were chosen for the Illinois Steel Company: H. H. Porter, A. J. Forbes Leith, Morgan Rotch, N. Williams, N. Thayer, Marshall Field, W. R. Stirling, Robert Forsyth, Francis Bartlett, Jay C. Morse and H. G. Smith. The directors elected Jay C. Morse president; W. R. Stirling first vice-president; H. G. Smith, second vicepresident; J. C. Stirliug, treasurer; H. A. Gray, secretary.

The Huntingdon Car and Wheel Works were sold at Huntington, Pa., on the 10th inst., at sheriff's sale on a mortgage against George W. Ditheridge, a former owner of the property. The property was bought in by the attorneys for the bondholders, secured by the mortgage. The sheriff's deed will be made to Percival Roberts and Charles Scott, of Philadelphia, and K. Allen Lovell, representing the Union Bank, of Huntingdon. The final bid was \$23,000, which covers the first mortgage.

gage. Queen & Company, Philadelphia, have bought the sole right to manufacture and sell John T. Warden's automatic drawing table, which has, during the two years since its invention, found its way into many of the best drafting rooms in the country, and has met with general acceptance. This table can be used in a horizontal position or at an angle, and is adjustable for both height and angle. The straight-edge which takes the place of a T-square is kept always parallel by a very ingenious motion by which the strings used in other patterns of drawing table are dispensed with.

patterns of drawing table are dispensed with. Arguments were heard by Judges Acheson and Buffington on the 13th inst., in the United States Circuit Court at Pittsburg, Pa., in the case of L. H. Bristol, of New Haven, Conn., and others against William M. and Walter Scranton and the Scrauton Steel Company, of Scrantou, Pa. The plaintiffs are stockholders in the company, and the suit is brought to compel the Scrantous to pay into the treasury of the company, to be distributed pro rata among all the stockholders, \$350,000 received by the Scrantons from the Lackawanna Iron and Coal Company as a bonus for effecting the consolidation of the two companies. The court has reserved its decision.

has reserved its decision. Bids were opened in the office of the Secretary of the Navy, at Washington, D. C., on the 15th inst., for 6,700 tons of niekel-steel and Harveyized steel armor for vessels now being constructed for the navy, in conformity with an act of Congress appropriating \$4,000,000 for the purpose. A number of prominent steel manufacturers were present, among them, Mr. H. C. Frick, of the Carnegle Steel Company. Contrary to expectation, there were two bidders only, the Carnegie Steel Company, of Pittsburg, and the Bethlehem Iron Works, FEB. 18, 1893.

THE ENGINEERING AND MINING JOURNAL.

of Bethlehem, Pa. On account of the complicated nature of the bids submitted, it is impossible at this time to give a comparative statement of them. The prices asked for nickel-steel ranged from \$525 to \$650 per ton, according to the shape of the plate, and for Harveyized steel from \$575 to \$675 per ton. The lowest bids on the principal single ex-hibits were as follows: By the Bethlehem Com-pany—On 13-in. turret plates of nickel-steel, \$212,043; Harveyized, \$335,282; on 12-in. turrets of nickel-steel, \$321,976; Harveyized, \$355,010; on \$-in. side armor or nickel-steel, \$337,351; Harvey-ized, \$371,711. By the Carnegie Steel Company— On 8-in. turret plates of nickel-steel, \$82,157; Har-veyized, \$95,340.

veyized, \$95,340. The sub-committee of the House Naval Commit-tee has investigated the causes of the delay in gov-enternment contracts for armor plate. Representa-tives of the Carnegie company and the Bethle-hem Iron and Steel Company appeared before the sub-committee and gave reasons why the work was not put out more quickly. The former company stated that the first order was not received until orders was at once begun. From June 30th until stopped or only in partial operation on account of labor troubles. This, with the delay in getting new machinery, from the Whitworth company in Eng-land, and the necessity when it was received of the company stated that their first difficulty was five for the use of the Bethlehem Iron and Steel Company stated that their first difficulty was hive y of armor plate was made in August, 1891, to oving to the overly of the work, the full con-traction of the shapes desired. Moreover, all the forging scompleted by the difficulty of the stop over 300 tons a month, and expects to have delay has been occasioned by the difficulty of the stop of the order by the difficulty of the stop over 300 tons a month, and expects to have delay has been occasioned by the difficulty of the stop over come, and new troubles may yet arise.

the difficulties of Harveyizing plates are not yet eli-tirely overcome, aud new troubles may yet arise. It is announced that the negotiations for the con-solidation of the two great companies manufactur-ing wood-working tools in Cincinnati-the Egan Company and J. A. Fay & Company-have been completed, after long negotiation, and the officers of the new J. A. Fay & Egan Company will take charge about March 1st. The directors of the new company, which will be the largest concern of its kind in the world, will be Thomas P. Egan, Fred-erick Danner; W. H. Doane, D. L. Lyon, David Jones, W. P. Anderson, Joseph Rawson, S. P. Egan and Edwin Ruthven. Thomas P. Egan will be president and the soul of the enterprise, as he has been of the old Egan company; Mr. Danner will be vice-president, S. P. Egan superintendent, and Mr. Ruthven sceretary. These four officers are of the Egan company. The Egan company was formed about 1873, and started with a small factory, but the basiness grew so fast that fre-ent stock company was organized, and gradually the works have grown to their present extent, employing over 800 men, and making an almost end foreign unarkets. The original J. A. Fay & Company started in Keene, N. H., in 1835, in a small shop; the Cincinnati establishment was be-sund shop; the Cincinnati establishment was be-sund shop; the Cincinnati establishment was be-sund the original house. J. A. Fay & Com-pany have done a large business abroad, and have exhibited at all the great international expositions, beginning at London in 1851, and receiving many prizes and testimonials.

beginning at London in 1851, and receiving many prizes and testimonials. The firm of H. K. Porter & Co., in Pittsburg, the well known builders of light locomotives, on Fobruary 14th issued to all their employees a cir-cular announcing the distribution of profits for the year. This is the eighth year that they have made this voluntary distribution, which is based on the annount of wages paid and length of service, and which has proved a very successful system. In the circular the firm says: "We are especially gratified that the amount distributed is not de-conditions of business the past year have been very trying, and in many respects discouraging. Prices were less throughout the year than in 1891, and the output for the first six months was very small. But as soon as the demand increased, the output largely increased; and by your efficient co-oper-ation, so soon as you had the opportunity to put it forth, we largely recovered the lost ground. This proves to us what we believed before, that prac-tical co-operation is a positive benefit to every one of us, and that it pays us partly, if not fully, in the item of dollars and cents, to make this dis-tibution. We have often said to yon that it is only on this basis that we can hope to make such distribution a permanent annual thing. But such reasonable return to us only makes ns the more gratified to recognize your efficient and cheer-ful service, and to be able t, give you this ad-ditional remuneration for your faithful labor. We hope that in receiving this sum, each one of you is conscions of having deserved it by having ren-dered the best service in his power; and that the money will be a positive good to each one; and to all dependent upon yon."

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If any one wanting machinery or supplies of any kind will notify the Engineering and Mining Journal of what he needs, his "Want" will be published in this column and his address will be furnished to any one desiring to supply him. Any one wishing to communicate with the parties whose wants are given in this column can obtain their address at this office. No charge will be made for these services. We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line, time enabling the pur-chaser to select the most suitable articles before or dering.

dering. All these services are rendered gratuitonsly in the in-terest of our subscribers and advertisers; the proprie-tors of the Engineering and Mining Journal are not brokers or exporters, nor have they any peculiary in-terest in buying or selling goods of any kind.

Goods Wanted at Home.

Planers. Ohio. A good grist mill and corn crusher. Flor-2.937.2.938. 2,938. ida. 2,939. 2,940. 2,941. 2,942.

- Saws. Ohio.

2.039. Saws. Ohio.
2.940. Coppered wire. Kentucky.
2.941. Belting. Ohio.
2.942. Shafting. Ohio.
2.943. Pulleys. Ohio.
2.944. Veneer cntting machines, etc. Ohio.
2.944. Veneer cntting machines, etc. Ohio.
2.945. A 12-HP. engine and boiler. Tennessee.
2.946. Burners, kilns or furnaces for making charcoal. Idaho.
2.947. An outfit for a canning factory. North 2.948. Prices on a complete outfit of machinery for the manufacture of drain tile, including dry sheds and kiln. Tennessee.
2.949. Machinery for a 20-ton cotton oil mill plant. Texas.
2.950. A full outfit of machinery for scouring, carding and spinning wool; also for weaving a low class of trouserings, cotton warp and woolen weft. North Carolina.

arolina. 2,954. A moss gin and press. Georgia.

GENERAL MINING NEWS.

ALABAMA.

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ARIZONA.

(From our Special Correspondent.)

The mining assessments falling delinquent dur-ing the month of February amounted to \$20,000.

· CALIFORNIA.

(From our Special Correspondent.)

The mining assessments falling delinquent dur-ing the month of February aggregate \$7,000. Amador County.

Amador County. Amador Gold Mine.—This property was sold by the sheriff on the 30th ult. on an execution issued on a judgment held by J. P. Darling. Mr. Dar-ling bought the property in for the amount of his judgment, the amount of the judgment liens and the expenses making a total of \$7,027.22. This is subject to redemption within six months.

Dolores County.

Dolores County. Enterprise Mining Company.—This company, says the Rico "News," will shortly commence the erection of a large concentrating mill to handle the immense amount of low-grade ore blocked out in the Laura mine. When the mill is ready a large force of men will be put on the mine and large amounts of ore will be moved. The ore is opened up for a distance of 800 ft. The ore will be lowered through chntes to the level of the Group tunnel, through which it will be taken and dumped directly into the cars. The product, therefore, can be handled at a minimum cost.

Los Angeles County. (From our Special Correspondent.)

Los Angeles County. (From our Special Correspondent.) The Southern California Smelting and Refining Company, Los Angeles.—The opposition manifested by the City Conneil has been overcome, and work has been commenced on the smelter that will start up early in April. The initial cost is estimated at \$53,000, the plant having a capacity of from 200 to 250 tons of ore per day, the arrangements be-ing such that, if the necessity should arise, the capacity can, without much trouble or considerable cost, be materially increased. Much of the ore, it is expected, will be received from the States of Sonora, Chihuahua and Durango, in Mexico, via El Paso and Mazatlan, and at least \$,000 tons of ore per annum is reckoned on from this sonree. Owing to com-petitive railroad facilities, Arizona and New Mexico are also expected to furnish their quota of the gen-eral amount of ore handled. In the works coal will be used only for steam heating. New Mex-about \$8 per ton, being uuch cheaper and better adapted for the high-heating requirements of the smelting works. Mendocing Connty smelting works.

Mendocino County. (From our Special Correspondent.)

A new find of a rich vein of quicksilver has been made in the shaft of the mine belonging to a newly-formed corporation operating at Fort Brown, seven miles west of Ukiah. The value of the new devel-opment has not yet been fully ascertained. Mono County.

(From our Special Correspondent.) Standard Consolidated Mining Company, Bodie. —A bullion shipment valued at \$16,800 has been received at the San Francisco office.

Nevada County

Nevada County. Brunswick Consolidated Gold Mining Company. -Mr. W. A. Hawley, superintendent of this com-pany, writing from Grass Valley, under date of February 8th, says: "No development work has been done since my last letter, owing to the heavy storms which have filled the grounds with water. We have had to do considerable work in the drain tunnel, as it is of vital importance that the mine should be kept open. We have the ground well secured now, and will be able to keep the drifts on the 700-ft. level going steadily."

COLORADO.

The Creede & Gunnison Railroad has been lo-cated from Creede to the Amethyst mine, a dis-tance of 12 miles, and work is to be begun as soon as the snow will permit. The line has 4% grades and 24° curves. Spurs to all the leading miues in the district are included in the plans.

Gunnison County.

Fairview.—A strike has been made at this mine at Pitkin. On the 6th level, at a depth of 600 ft., a 10-in. streak of silver glance was found which is reported to assay \$100 to the ton.

Lake County.

Lake County. Catalpa Mining Company.—At the annual meet-ing of this company, held in New York during the pust week, Messrs J. P. Whitney, B. C. Paddock, H. Bartliug, C. P. Schumacher and John C. Wat-son were chosen trustees. The receipts and ex-penditures and trial balauce are here given: Sur-plus, December 31st, 1891, \$41,651.60; product of 7,072 tons silver and iron ores, \$35,479.26; total, \$77,130.86; expenses, \$35,116.27; surplus December 31st, 1892, \$42,014.59. Assets—Mine and plant, \$3,020,777.82; general expenses, \$43,844.85; divi-dends, \$270,000; cash, \$15,648.70; loan to the Cres-ent Mining Company, \$27,417.09; total, \$3,377,-688.46. Liabilities—Capital, \$3,3000,000; mining account, \$377,688.46; total, \$3,377,688.46.

eht Mining Company, \$21,417.09; total, \$3,377, 688.46. Liabilities—Capital, \$3,000,000; mining account, \$377,688.46; total, \$3,377,688.46. Crescent Mining Company.—At the annual meet-ing of this company held in New York during the past week Messrs. J. P. Whitney, B. C. Paddock, H. Bartling, C. P. Schumacher and John C. Wat-son were chosen trustees. The receipts and ex-penditures and trial balance show: Product of 5,695 tons silver and iron ores, \$23,482.66; ex-penses, \$20,963.18; earnings, \$2,519.48; indebted-ness December 31st, 1892, \$27,300.45; assets, mine and plant, \$3,003,775.41; mining account, \$2,110.33; general expenses, \$21,414.71; cash, \$116,64; total, \$3,027,417.09; liabilities, capital stock, \$3,000,000; loan from the Catalpa Mining Company, \$27,417.09; total, \$3,027,417.09. Ibex Mining Company.—An injunction has been filed by Clarence J. Hersey against F. G. Rich-ardson and the Ibex Mining Company. Hersey represents that in March, 1889, Richardson was the owner of a one-half interest in the Little John-nie mine, and as he was not a resident of the State and desired to have his interests looked after, he agreed to pay Hersey 20% of his revenue from the mine to look after his interests, and Hersey kept his part of the agreement. Richardson later leased his share of the property to the Ibex Mining Company, which has since extracted large quanti-ties of valuable mineral. Hersey alleges Richard-son has received \$72.000 in royallies from the prop-erty and disposed of a portiou of his interest, on all of which he, Hersey, claims a percentage. Pueblo County. Colorado Fuel Company.—On Febrnary 12th e

Pueblo County. Pueblo County. Colorado Fuel Company.—On February 12th a slide occurred in the wall rock in one of the tunnels at the Orient mines of this company. Six men were killed and six injured. The mines are located

North Carolina. 2,951. Prices and catalogues of rails, fasten-ings and rolling stock. Texas. 2,952. Chloride of calcium. Ohio. 2,953. Machinery for making coiled hoops, staves, spokes, handles and shuttle blocks. North Carolina

eight miles from Villa Grove, at the terminus of a spur of the Rio Grande road. They are among the best properties owned by the company. The product of the mine is shipped to Bessemer. Sagnache Connty.

Sagnache Connty. A press dispatch from Denver says that it is now reported that the sale of the Amethyst mine, at Creede, together with the Hillisde aud Hidden Treasnre, to a New York syndicate has been com-pleted. Mr. Frank L. Roudebush, who has been conducting the negotiations, returned from the East on the 11th inst. with the announcement that the deal had been made and the money paid over. The price paid was \$1,500,000.

Colorado Fuel and Iron Company.—A slide oc-curred in one of the tunnels of the Orient mine of this company on the 11th inst., killing six meu and severely injuring as many more.

GEORGIA.

Carroll County.

GEORGIA. Carroll County. I have again visited the vicinity I referred to in your issue November 26th, where my attention wy last visit the owner of the land has performed some prospect work, sinking on oue vein of asbestos some 10 ft. The quality, although somewhat bet-ter at this depth than at the surface, is still rather strength of the Canadian, which is accounted for by the clay associated with it. At the depth re-form grit was encountered. A drill test proved asbestos was again encountered, but as the rainy weather prevented work. I was unable to obtain synchest, and on the surface the outcropping of schist rock, and on the surface the outcropping of schist rock, and on the surface the outcropping a distance of about 500 ft., with a general course northeast of the prospect hole, and in line with it, and on about the results of this prospect is between it is an end the same level as where it is with it, and on about the results of this prospect is being to some the results of this prospect is being to be about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is being borhood about the results of this prospect is borhood borhood about the results of this prospect is borhood borhood about the results

Haralson County.

Barbard Bar

IDAHO. Coeur d'Alenes.

Coeur d'Alenes. Black Bear.—The drifting of the tunnel being run to open up the 5th level is being seriously inter-fered with by the looseness of the ground. The tunnel is $4\frac{1}{2}$ ft. \times 7 ft. in the clear and will ent the ore 550 ft. in. At present ore is being taken out of the 4th tunnel only, which is 800 ft. in; 45 men are stoping on the east drift. The mill contains 8 Hartz jigs, and has a daily capacity of 75 tons, producing 15 tons of concentrates containing 27 oz, of silver per ton and 60% lead.

Owvhee County.

(From onr Special Correspondent.)

(From onr Special Correspondent.) The Howe. Manhattan & Sepley Mines.—These groups of mines, situated in the Delamar district, have been sold to a syndicate of Milwaukee capi-talists, headed by H. J. Millman. The purchase price is reported to have been \$350,000. Black Jack Mining Company.—This company is drifting sonth from the main drift and also from the winze. No stoping is being done. A 200-ton ore house was put up during the early winter, and is now full.

now full.

Blaine Tunnel.-The tunnel is now in 2,400 ft. and

making about 7 ft. progress per day. The company is stoping in two different places in the tunnel, one on the Blaine ledge and one on the Trade Dollar ledge. The former is 90 ft. in length, the ledge is $2\frac{1}{2}4$ ft. in width, from 4 to 10 ins. of which, on the footwall, assays \$160 per ton. The latter stope is 60 ft. in length, and the ledge is 2 ft. in width, about 6 ins. of which assays \$150. The ledge in the present face is 6 ft. wide. Something over 400 ft. farther will have to be rnn to cut the rich shoot of cre enconntered in the upper workings of the Trade Dollar. Teams are now hauling ore from the Trade Dollar mine to the mill. mill.

mill. De Lamar Mining Company.—The new hoisting works, now completed, were constructed for the purpose of sinking a shaft to the mill tunnel level This tunnel starts in just above the level of the ore house of the present mill and, when completed, will eut the vein series 472 ft. vertically below the Wahl tunnel, and 1,100 ft. under the summit. Eventually ore will be delivered at the mills by track in this tunnel, which will reach the first series of veins at a distance of 3,600 ft.

Ketchnm Smelter.—This smelter is now working full time with 50 men.

MICHIGAN.

Gold. Gold. Fire Centre Gold Mining Company.—All work has been stopped on the property of this compauy, owing to the shutting off of the water supply by the intense cold weather. It is not yet decided whether the company will again commence explor-ing work in the spring. (From our Special Correspondent.) Visio Contex Cold mine has cleared down. Work

Fire Center Gold mine has closed down. Work hay be commenced in the spring. Copper

Adventure Mining Company.—The annual meet-ing will be held in New York, March 2d. At the mine a few men are kept at work in drifting on the 2d level, where the vein on which this new part of the mine is being opened (the Knowlton vein) holds its own, and looks well for copper.

part of the mine is being object (the Knownor vein) holds its own, and looks well for coper.
Arnold Mining Company.—The shaft is down 420 ft. The 3d level drift going west is said to be in good looking ground.
Atlantic Mining Company.—The January output amounted to 239 tous—1,760 lbs. of copper.
Calumet & Heela Miuing Company.—According to the Portage Lake "Gazette" the amygdaloid lode overlying the Osceola, which has been cut by a cross-cut at the 31st level, between No. 3 and 4 shafts is about 34 ft. wide on the pitch of the lode. In driving the cross-cut through this lode about 3 tons of barrel work were taken out. The stamp rock is of a clean character. There are several amygdaloid lodes betweeu the Calumet & Heela and the Osceola, but the one referred to is the lode overlying the Osceola, and has before been cut in the Tamarack, but has never been worked to any great extent. It is possible that this lode will yet prove to be productive.
Franklin Mining Company.—The January output the one preferred to is the lode of the order of the productive.

The prove to be productive. Franklin Mining Company.—The January output amounted to 180 tons—485 lbs. of copper. Knowlton.—This mine has been sold to Mr. Ed-mund Hendricks, of New York. The mine, con-sisting of 590 acres of land, was purchased at public sale for \$1,750. The proceedings were the winding up of the affairs of the corporation, ac-cording to the Outonogon "Herald." It is no doubt a move in the direction of consolidating several of the mines in Greenland township, which, in early days, produced copper iu paying quantities, but which will not pay to work now unless adjoin-ing territory can be secured. Quincy Mining Company.—During January this

Quincy Mining Company.—During January this company produced 700 tons—35 lbs. of copper.

Erie Car Works, Limited.—The failure of this company, of Erie, Pa., has caused the Martel fur-nace, located at St. Ignace, to go out of blast. Ex-ecutions exceeding \$100,000 have beeu levied npon the works and furnace. The furnace had a capac-ity of 23,000 tons of car wheel iron annually. Nothing is yet known as to the future operation of the plant.

the plant. (From our Special Correspondent.) The Martel furnace, at St. Ignace, has gone out of blast owing to the failure of the owners, the Erie Car Works, of Erie, Pa. Ore used at this furnace came from here. Its specialty was car wheel iron wheel iron.

Unwatering the Chapin and Hamilton mines has ceased because of a quarrel between the owners regarding the compressed air plant at Quinnesec Falls and its use. Some day big works in ore mining will be seen here.

A big cave-in at the Cleveland occurred recently, carrying down everything up to grass. No one was hurt by the disaster. Nearly the whole of Ishpem-ing, Mich., is undermined, and this sort of occur-rences must be expected continually. Ishpeming is built wholly upon the hanging wall of an immense body of ore.

Local papers are already sneering at the Mesaba. This is one proof of its great ability to produce ore. A bad habit of papers on one range is to abuse the outlook of another range. This the local press here has done continually, but other ranges grow to greatness all the same.

Alex. Maitland has resigned his position of

superintendant of the Negaunee & Ishpeming elec-tric car line, and Charles Merryweather is ap-pointed. Both of these gentlemen are known as successful miners of ore. Governor Rich, of Michigau, has just appointed Thomas B. Dunstan, of Hancock, a member of the Michigan Miuing School Board. Mr. Dunstan is well known as largely connected with the copper mines of the upper peninsula. Houghton County furuishes a large number of students for the school. A committee of members of the State Leg-islature has recently visited the institution, and at once saw the need of larger accommodation for the scholars. A bill to enlarge the school is to be at once introduced. The Fitch mine, which suspended last fall, is

be at once introduced. The Fitch mine, which suspended last fall, is again to be exploited, James Curnow having se-cured it under contract. It is well equipped, and there is a good showing of ore, which will probably develop into something of value as more ground is opened up. The property belongs to the Cleveland-Cliffs Company. There is some anxiety on the next of mine and

develop into something of value as more ground is opened up. The property belongs to the Cleveland-Cliffs Company.
There is some anxiety on the part of mine managers concerning the ability of the pumps to keep the mines unwatered, as the deep snows of vinter astrous results are feared. The porous chacacter of the overlying rocks to the ore bodies will readily admit a passage of all surface waters, and each spring brings along with it a time of suspense. The water soaking through also, as it thaws and freezes, damages and weakens the walls, and makes mining more dangerous.
Iron-Marquette Range.
Ames Iron Company.—At this property, located in the corporate limits of the city of Ishpeming, along with to the west, and on the trend of the over limits of the city of Schemen (0) and 70 ft., and explorations are now following along the foot wall to the west, and on the trend of the vein. The latter has been proved, by cross-cutting to possess a thickness of 60 ft. The ore is of good quality, and thus far has been very clean. Cleveland Incline.—On Saturday night, February Ath, a cave-in occurred from the surface at this mane. An area of ground 40 × 60 ft. dropped some 65 or 70 ft. into the mine. Within a short distance of the place where the earth sank were two working a force of between 30 and 40 men getting the ore out. The usen were working at this point during the day, when they observed that sank kept falling continuously, so they apprehended that sonther part of the nine. On the north and east sides of the hole, extending 10 or 12 ft. from its output of the ground will go down shortly.

Dexter Mining Company.—The company has suuk the shaft an additional 60 ft. since the 20th of last December. The mine is looking well, and could produce 30,000 tons of manganiferous ore this season, if there was a demand for that amount, says the "Irou Ore."

Foxdale Iron Company.—A stockholders' meet-ing was held at Ishpemiug February 7th. Thomas Buzzo, R. Maxwell, M. B. Toutloff, M. Cassin, Ole Walseth, W. Vicary and C. R. Ely were elected directors, with Mr. Thomas Buzzo as presi-dent and manager.

elected directors, with Mr. Thomas Buzzo as presi-dent and manager. Minnesota Mining Company.—The Minnesota mine case has been decided in favor of Mr. Jeffs, the plaintiff, for \$20,000, with interest at 7% since 1884. The facts connected with the case are these: The National Mining Company brought suit against the Minnesota Mining Company brought suit against the Minnesota Mining Company for damages, claim-ing that, owing to its negligence in not taking eare of the water, it was allowed to flow into the Na-tional mine, to its damage and great expense. The ease was stubbornly fought in court by both sides, and won by the National Mining Company, with heavy damages against the Minnesota company. To meet this Mr. Jeffs advanced the \$20,000 in cash, taking a mortgage ou the property of the ompany. The case was tried in the higher court and reversed; meanwhile the parties controlling the National got control of the Minnesota property, and failed to pay back the money to Mr. Jeff to li-quidate the mortgage. The National people set up claim of illegality of mortgage, etc., and since then have staved off by delay the payment of prin-ciple or interest of the mortgage, with the result recorded above. Iron—Menominee Ranze. recorded above.

recorded above. Iron-Menominee Range. Chapin Iron Company.-There is a dispute be-tween this company and the Hamilton-Ludington company over the power supplied by the hydraulic plant at Quinnesec. Under the former agreement the Chapin mine owned two-thirds of the power so supplied in the way of compressed air, and the Luddiugton mine possessed the remaining one-third. The Ludington has now been coupled with the Hamilton, and the Chapin company objects to their using the power, and the question will prob-ably be referred to the courts. In the meantime the task of bailing the water from the Hamilton-Ludington has been stopped, and will probably not be revived until the disagreement has been satis-factorily settled.

MISSOURI. Jasper County. (From our Special Correspondent.)

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MINNESOTA.

Iron-Mesaba Range.

Iron-Mesaba Range. This range is to have another railroad, the Mis-sissippi River & Northern Railroad Company hav-ing arranged to complete the road to section 58-20, about 20 miles from Iron Monntain. The road will pass through the richest iron lands ou the range. The road will haul ore to a connecting point with the Dulnth & Winnipeg, where the cars will be transferred and carried over that road to the docks. The extension will be connected by June 15. There are 14 miles to build. Iron-Vermilion Range. At the Chandler and Minnesota mines there are

At the Chandler and Minnesota mines there are about 320,000 tons in stockpile, and about 6,000 tons per day are being raised at both places. The Minnesota will, it is said, mine 600,000 tons, and the Chandler 700,000 tons of ore during 1893.

MONTANA.

Deer Lodge County.

Hope Mining Company.—During December this company turned out \$120,000 in silver, and, accord-ing to the Phillipsburg "Mail," this record was surpassed in January of this year. Cascade County.

May and Edna.—Some time ago a body of copper ore 25 ft. wide was struck in this mine. Since then, says the Anaconda "Standard," it has been prospected by a cross-cut and a drift 112 ft. long, and it proves to be a very large deposit of ore.

Silver Bow County.

Silver Bow County. Butte & Boston Mining Company.—A force of men are now engaged taking free milling ore from the Silver Bow shops which, according to the Butte "Inter-Moutain," indicates that the Silver Bow mill will soon be started. The other mines of the company are being worked as usual, and the smel-ter is being run full time. This company pro-duced 550 tons of matte the first nine days of this month, or at 53% fine, 605,000 lbs. Its silver product for the same period was 17,500 oz. The sil-ver mill was started February 9th. Odin —Messrs, Kelly & Co. Jessees of this mine.

Odin.—Messrs, Kelly & Co., lessoes of this mine, have struck a 5-ft. vein of ore which, according to reports, will run \$40 per ton in silver.

NEVADA.

(From our Special Correspondent.) Mining assessments falling delinquent during the enrrent month aggregate \$227,300.

Esmeralda County.

(From our Special Correspondent.) (From our Special Correspondent.) Mt. Diablo Mining Company, Candelaria.—A bullion shipment containing 4.375 oz has been re-ceived at San Francisco. The company reported a credit on the 1st inst. of \$1,300.02. Eureka County.

Diamond Mine, Eureka.—Th main drift is now own 340 ft., below the tunnel level. It is currentdos

ly reported that a new and very large body of ore has been struck.

has been struck. Eureka & Palisade Railroad.—During the month of January this company received 1,316 tons of ore for shipment to Salt Lake City, as follows: Eure-ka district, from the Diamond mine, 641 tons; Eureka Consolidated Mine, 384 tons; Jackson uine, 89 tons; Richmond mine, 72 tons; Bullwhacker mine, 60 tons, and Hamburg mine, 47 tons; total Eureka district, 1,293 tons. From White Pine County, 23 tons.

Eureka district, 1,293 tons. From White Pine County, 23 tons. Ruby Mining Company, Limited.—The super-intendent and secretary of this company have been discharged, and the secretary of the Richmond company has been appointed, in addition to his former duties as general agent of the latter, to act in a similar capacity for the Ruby company. This will cut expenses down to a minimum. There now no days' pay men employed by the com-pany, and the tributaries are getting very little (ie. The Dunderberg mine is in a bad condition— filed with waste rock and caving in every direc-tion. At the 230-ft level the manway has caved in the mine are old and continually cracking, and the too for the result of the finances of the company are in a very low condition, and it opmany's ground to pay for repairs. The Bull-whacker is now the only mine that is paying the optime of the company are in a very low condition, and it does not appear probable that any effort will be made to raise new capital; indeed, it would not additional ground. The debenture bonds of the company fall due in 1895, and, if general appear-tion the relived from working the mines in the original ground. The debenture bonds of the company fall due in 1895, and, if general appear-tion active to the bondholders.

Storey County-Comstock Lode.

Storey County—Compstock Lode. Belcher Mining Company.—The latest weekly offi cial letter says: We have started south from the west crosscut from the south drift, 350-ft. level, and are now out 30 ft. The face is in a mixture of por-phyry and quartz giving low assays. The raise from the north drift, 350-ft. level, 75 ft. north of the winze from the 300-ft. level, has been advanced to and con-nected with the north drift from the stope above. Have started an east crosscut from the north stope below the 300-ft. level 40 ft. north of the winze. It is out 24 ft. and has cut a width of about 3 ft. of quartz yielding fair assays. We have on hand in the dumps at the mine about 400 tons of ore, and are adding to it at the rate of 15 to 20 tons per day, extracted from thestopes above and below the 300-ft. level at the north winze.

Consolidated New York Mining Company. company has declared its first dividend at th -This

Consolidated New York Mining Company.—This company has declared its first dividend at the rate of 10 cents per share, aggregating \$10,000, and pay-able February 15th. After paying the dividend the company will have \$9,100 left in the treasury. Crown Point Mining Company.—The latest offi-cial weekly letter says: The west crosscut from the sonthwest drift, 150 ft. south of the shaft on the 400-ft. level, is out 275 ft. The face is in a mixture of slate, clay and porphyry. We are following the streak of ore south from the raise that was put up from the sixth floor above the 160-ft. level on both the sixth and eighth floors. It presents no change of importance for the week. Have shipped to the United States Mint in Carson two bars of bullion, the par value of which was \$6,413.17, yielding in coin \$4,901.87.

Justice Mining Company.—The latest weekly let-ter says: The south dift from the stope on the s22 level is now out a total distance of 103 ft.; the face is in ore assaying from \$15 to \$20 a ton. Shipped to the Washoe mill during the past week 164 tons and 1.620 lbs, of ore, the average battery assay of which was \$15.02 per ton.

which was \$15.02 per ton. Overman Mining Company.—The report of the superintendent for the month of January shows that there were extracted from the 1,100-ft. level. 39 tons and 725 lbs. of ore. The car samples av-eraged \$21.72 per ton. Shipped to the Vivian mill 164 tons and 560 lbs. The mill worked 813 tons and 1,360 lbs. The battery average of the ore was \$16.60 per ton. The gross hullion yield was \$12,477.14 or at the rate of \$15.33 per ton. The ore was worked up to 92% of its assay value.

at the rate of \$15.33 per ton. The ore was worked up to 92% of its assay value. Savage Mining Company.—The latest weekly official letter says: "We have hoisted 510 cars of ore from the 950, 1,100, 1.4 0 and 1,450 levels; shipped to the Nevada mills 450 tons; average car sample assay, \$23; average battery assay, \$24.18; bullion yield for the week, \$76.14; shipped to United States Mint at Carson, February 3d, 488 lbs, of crude bullion: On the 1,100 level we are stoping ore from the 11th floor up to the 22d floor. On the 1,300 level the west crosscut, started from the main south drift 120 ft. south of the shaft, is now advanced 46 ft.; face in quartz and porphyry. We have commenced stoping north and south on the 6 ft. of ore men-tioned in last weekly letter passed through in this drift. On the 1,400 level the north ore stope is now carried up 55 ft. above the sill floor. This stope will be connected with the west crosscut 1,300 level the latter part of the coming week. We have finished the repairs to the east drift, but are still repairing the south drift on this level. On the 1,400 level we are stoping out upward from the end of the west crosscut started 100 ft. from our south boundary." The amount of money disbursed for labor by min-

ing and other corporations on the Comstock lode for the month of January amounted to \$131,238. This was \$8,853,67 short of the December payrolls. The shrinkage is attributable to the suspension of Gold Hill pumping operations and diminution of work in the Yellow Jacket, Confidence, Challenge and Imperial mines.

(From cur Special Correspondent.)

The following is the weekly tabulated state-ment of ore extracted from Comstock mines and milled, with the car sample and battery assays, bullion shipments, etc.:

Mines.	Tons Hoisted.	Cer Sample Assav.	Tons Milled.	Average Battery Assay.	Bullion Product for Week.	Bullion Shipped.
Belcher	140					
Con. Cal. & Va	1389	230.63	\$359			4437 lbs.
Con. New York	131	38.10	191	32.70		\$\$4.335.78
Crown Point						·26,413,17
Kentuck	14					
Overman	39	21.72	164			
Potosi	441		441	27.07		7440 Its.
Savage	8510	23.	450	24.18	7.614	9486 lbs.

Cars. ² Mine car sample. ³ Railroad car sample, 05. ^{4 5 7 9} Crude bulhon. ⁶ Par value, yielded in colu. \$31 05. \$4,901.87.

White Pine County,

Pinto Mining District. Philadelphia Mine, Silverado.—A vein of ore 18 in. thick has been discovered that carries 100 oz. silver to the ton, 36% lead.

Rescue Mine, Silverado.—Two lessees are mak-ing good wages, and have a fine prospect ahead. A large amount of very rich ore was formerly taken ont of this mine. It would still be a good property if capital were applied for its development.

NEW MEXICO.

NEW MEXICO. Bucyrus Placer Mining Company.—This company has just been incorporated under the laws of this Territory, and will operate placer mines on the Chama River, in the northern part of the territory. The placer fields where the new company will oper-ate are quite extensive, and there is an abundant supply of water, but the gold exists in a finely divided state, and is consequently difficult to sare. The ordinary sluicing process cannot be worked suc-cessfully in this region, and Bucyrus amalgamators will be used, which will, it is claimed, save the finely divided particles of gold. There are many thousand acres of placer ground on the Chama River, and if the amalgamators work successfully the Chama Valley will become a very important gold-producing region. OHIO.

OHIO.

Lucas County.

Lucas County. Two big "gusher" oil wells wers struck on the 11th inst. south of Toledo. One of them on the Hoagland farm, Middletown Township, is said to be spouting over 1,000 barrels a day. No tankage had heen prepared; the pressure is so great that the flow can ot be checked and the oil is flooding the adjacent fields. The other well referred to is nearly as fine.

Portage County.

Akron Gas and Oil Company.—This company has leased land in the vicinity of Ravenna and proposes to put down four test wells, which, according to the lease, must go down 4,000 ft. The company also agrees to par \$150 royalty a year for each gas well and to give the lessor a royalty of one-eighth the product, and to pay 15 cents per ton upon all coal mined. mined.

PENNSYLVANIA.

Coal.

A. S. Vanwinkle & Co., operating the Milnesville colliery, laid off 120 men on the 14th inst. indefi-nitely. It is believed that the stripping operations are being worked out and new openings will have to be made.

Fire was discovered in the shaft used as a rope-way leading to the Brick Mountain vein at Packer Colliery No. 4, Shenandoah. Batteries were built to cut off all draught, and water was immediately turned upon the burning mine. The fire was extinguished after 24 hours of incessant labor.

Coxe Bros. & Co. have had prospectors at work during the past several months in the vicinity of Eckley. The proving was prosecuted on what is known as the Old Fuck Mountain tract. It was supposed that the Primrose vein, which is about 7 ft. thick, lay in the vicinity, but the boring struck the Mammoth vein on the 14th inst.

the Mammoth vein on the 14th inst. Ten citizens of Port Carbon entered in court at Pottsville, on the 14th inst., suits for damages against the Dodson Coal Company, Linderman & Co. and Taylor McTurk & Co. The aggregate amount of the damages claimed is \$21.300. The plaintiffs are owners of real estate at Port Carbon, near the banks of Mill Creek. The defendants are owners and operators of collieries and washeries on the banks of this creek. The planniffs charge that the defendants have repeatedly thrown, unlawfully, large quantities of muck, dirt, cuim, etc., into the stream, and that this debris has been carried down the creek, injuring their properties. Lehigh Valley Coal Company.—This company on

Lehigh Valley Coal Company.-This company on the 15th inst. gave a mortgage on its stock for

\$12,000.000 to the E. B. Wilbur Trust Company, of Bethlehem. The mortgage was filed in the Record-er's office in Wilkes-Barre, and is on coal lands in Carbon, Luzerne and Lackawanna counties. It is supposed the company has borrowed the money for the purpose of making some improvements. A press dispatch says that the officials at Wilkes-Barre ap-pear to know nothing about the matter Oil.

Oil. The Chief of the Bureau of Statistics reports the total values of the exports of mineral oils from the United States for the month of January, 1893, as compared with similar exports during the corre-sponding periods of the preceding year, as follows: January, 1803, \$2,788,474; seven months ending January 31, 1803, \$24,031,506; January, 1892, \$3,247,-223; seven months ending January 31, 1892, \$27,208,-018 018.

018. The number of petrolenm wells completed in the Pennsylvania fields during January was 123, a de-crense of 18 compared with December; the pro-duction of the January wells was 5,306 bbls., a decrease of 2.274 bbls.; wells drilling were 184, a decrease of 54; number of rigs in course of erec-tion was 109, a decrease of 13. In the Ohio fields the number of wells completed during January was 109, decrease of 5; production, 5,510 bbls.; in-crease, 603 bbls.; wells drilling were 73, a decrease of 4; rigs in course of construction, 61; increase, 8. In the Indiana fields 20 wells were completed, a de-erease of 27; production, 1,200 bbls., a decrease of 1,960; wells drilling 23, a decrease of 1. Siate.

Siate.

Siate. The sheriff of Lehigh County last week served papers in equity on Morran B. Williams, Thomas E. Jones and Thomas H. Hughes, of Wilkes-Barre, to show cause why a receiver should hot be appointed to liquidate the affairs of the Ellis Slate Company, whose plant is located at Slatington. The company is composed of the defendants and Griffith Ellis, the latter being the plaintiil. The capital stock is \$15,-000. A proposition to increase it \$6,000 caused the trouble and the suit. The injunction was dissolved by the court on the 14th inst., and the ease will go to a master. The defendants in their answer to the application for the appointment of a receiver declare that they do not intend to abandon the works, but would continue as soon as the season opens. Lebanon County.

Lebanon County.

Lickdale Iron Company.—The court has appointed J. W. Killgore receiver of this company, on the ap-plication of Dr. S. Weiss, executor of the estate of the late J. S. Lick, the principal stockholder of the company.

Potter County.-Coal.

The finding of a paying vein of good bituminous coal in this county has caused something of a stir, and the organization of a new railroad company called the Portage Creek and Rich Valley R. R. Co. The new line will open a coal and timber territory to the Buffalo market.

SOUTH DAKOFA.

Lawrence County. Buxton.—This mine will ship 45 tons to the Dead-wood & Delaware smelter, and 100 tons to Aurora, Ill., being the result of a clean-up of the dumps. It will then suspend operations.

will then suspend operations. Columbus.—This stamp mill in Sawpit gulch is running continuously and with satisfactory results. About 40 tons per day are reduced. Horseshoe.—As depth is attained evidences of the existence of the ore body sought on the property be comes more encouraging, says the "Black Hills Times." The shaft is now down 280 ft., and is being sunk six teet per day. The shaft has penetrated 230 ft. of porphyry, and is now in the shale, which has begun to show some signs of being mineralized. It is expected that the vein will be encountered with-in the next 25 ft. Upon this vein being discovered, drifting will be commenced and the exact trend of the contact shown up. Pactola.—It is reported that some ore running 860

the contact snown up. Pactola.—It is reported that some ore running \$60 per ton has been taken from this mine. It will be treated at the Lardner mill. Storwy Point.—Work which had been abaudon d on this property at Blacktail guleh will be resumed and the shaft snnk 35 ft. to the ore body.

UTAH.

Salt Lake County.

Leona.—A strike of rich galena is reported on this lode in Dixon Gulch.

Salt Lake City.—At a recent meeting of the Cham-ber of Commerce a resolution was adopted asking the Union Pacific Railroad Company to build an extension to Pioche, Nev. York.—There are over 100 tons of ore in the bins

waiting shipment.

Tooele County.

Muldoon.—The shaft is down 160 ft., the last 20 ft. being in mineralized rock containing gray copper and carrying some gold and silver. Cross-cuts have been run from the bottom both east and west. Most of the ore is free milling and it is said that a mill will be put up soon.

Willard County.

Deseret Mining and Milling Company.—This com-pany, at a meeting held February 10th, decided to buy a mill of 50 tons' capacity and the money was at

once raised. The mill will be a combination one and will cost \$35,000.

VERMONT.

Rutland County.

Vermont Marble Company. - A mass of rocks in one of this company's quarries at West Rutland, fell on the 11th inst. Five workmen were crushed to death WASHINGTON.

The Mt. Tacoma Bituminous and Anthracite Coal Company has been incorporated with a capital of \$20,000. WYOMING.

Natrona County.

McConnell Asbestos Company,—This company made its first shipment at the beginning of the month, According to the Casper "Derrick," the asbestos shipped is of a snow white color, fine and soft to the touch and of spinning length; it was mined at a depth of 40 ft, and is hand-cobbed.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

BRITISH COLUMBIA. The British Columbia Coal, Petroleum and Min-eral Company (limited liability) has been formed to absorb the Crow's Nest Coal and Mineral Company (Limited) and also for guaranteeing the dehentures or bonds issued by the British Columbia Southern Railroad Company for obtaining money for the con-struction of a railway from Miehel Creek. Crow's Nest Pass, to the international boundary, and thence to connect with some railway in Montana. Trail Creek.—The Le Roi shaft is down 180 ft., and two shifts of men are employed on the property. The grade of the ore is improving. Sbeep Creek.—The O K vein is the full width of the tunnel. The Blossom, a galena claim, is being developed by a shaft.

The Biosson, a garan characteristic for the probability of the solution of the last fit. The solution of the last fit is reported that there are 2 ft. for solid galena ore at the end of the last fit the Northern Bell mine. The winze sunk from tunnel No. 3 on the Blue Bird shows an ore body 2 ft. in thickness. An average of 12½ tons of ore are daily taken from the Freddie Lee. A force of men is working on the Solo, which is bonded by Lane Gilliam and J. F. Piggot.

GREAT BRITAIN.

It is reported that 65,000 colliery workmen engaged at the Associated Coalowners' pits in South Wales and Monmouth, besides workmen engaged at some of the non-associated pits, have received one month's notice to terminate contracts, through the failure of negotiations with the employers for a new sliding scale.

scale. There seems to be an increased demand for col-lieries, and indications point to a brighter future for the coal trade. At Selston Messrs. J. Oakes & Co. are opening out an extensive colliery which is expected to produce about 3,000 tons per week. The scam is 6 ft. 10 in. thick and is found at a depth of 465 ft. The Hetton Coal Company, Limited, owner of the Elemore Colliery, has decided to close that pit and to stop working one of the seams at Hetton. The Denaby Main Colliery Company has encoun-tered the seam at Cadeby. It is 2,250 ft. deep and 10 ft. thick. The plant provides for an output of 5,000 tons per day, which is said to be the largest of any English colliery. LOWER CALIFORNIA.

LOWER CALIFORNIA.

LOWER CALIFORNIA. Cedros Island Mining Company.—This company has driven three tunnels of 400, 90, and 60 ft., re-spectively. There is also an iron gravity-tramway, extending from the main tunnel one half mile down the mountain, connecting with ore bunkers at the side of the wagon road. The general manager of the property is L. S. MacLure, and the superintendent Heber Ingle.

(From our Special Correspondent.)

(From our Special Correspondent.) Compania Perlifera me la Baja California.—This company has obtained the lease of the pearl fish-eries from the Mexican government for a term of 16 years. The fisheries extend from the mouth of the Colorado River and Cape San Lucas, on the east eoast, and between Mazatlan and Barra de Suchiate, on the mainland, excepting the Ensenada de Chamela fisheries. The consideration is the pay-ment of \$10 per ton of pearl oysters during the first three years, and \$12 per ton during the remainder of the term of lease. To prevent the exhaustion of of the beds the fisheries will be divided into two portions and worked alternately every two years, the company further binding themselves to protect and extend the beds, and improve the breed by the introduction of superior varieties. MEXICO.

MEXICO.

MEXICO. The work of constructing one of the largest smelt-ing plants in Mexico has begun at Hedrizna, on the line of the Mexican International Railroad, north of Durango. The promoters of the enterprise are C. P. Huntington, president of the Southern Pacifle Company and the Omsha & Grant Smelting Com-pany of Denver and Omaha. The operation of the new smelter will cause a great saving to mine own-ers throughout the State of Durango, as at present all ore is shipped in bulk to the United States or Monterey.

Chihuahua.

Chihuahua. Batopilas Mining Company.-The aqueduct is about completed, and orders will soon be given for water power machinery to be used in driving the tunnel. Mr. S. H. Stevens, who recently visited the property, says: The tunnel is in 2,600 ft, and lacked only 35 ft, to connect with the air shaft which had been sunk to the tunnel level. That will furnish air to drive a tunnel to Roneesvalles, where another shaft will be sunk. There has been through 1892 a fair yield in Boncesvalles and San Miguel. I think it will run close to \$600,000, Mexican silver. All the work and improvements of the year have been paid for, and there has been a considerable re-duction in the Mexican debt. I think for the year the reduction will be §125,000, possibly more, when final accounts are made up. All the Mexicau debts, except to our banker, are paid, and our credit in Mexico is Al, and the general condi-tion there better than it has been for 10 years. The yield while I was there was slightly over 10,000 lbs per week. Silver has been taken out pretty steadily through the year in spots here and there, but all within a few hundred feet in length and at a depth averaging 225 ft, below the times of the Porfirio Diaz tunnel on the other side of the river. The most promising spot when I was there was 308 ft, helow the tunnel. We are now working in San Miguel, probably in silver 280 ft. below the river bottom. A conservative estimate would be \$200,000, taken at an average of 225 ft, below the Porfirio Diaz tunnel level last year. Steam hoists have just been put in Descubridora and camuchin, which will enable working below the old works that gave silver. La Goria.-A company has been formed in the fity of Mexico to work this mine. The property

Camuchin, which will enable working below the old works that gave silver. La Gloria.—A company has been formed in the City of Mexico to work this mine. The property includes 36 claims. The reduction works contain six Huntington mills of a capacity of from 100 to 115 tons per day. The mine and the mill are con-nected by a cable tramway. A 150 H. P. engine, which is supplemented during the rainy season by a turbine, turnishes motive power to the reduction works. The company intends to erect this month three new mills, when the quantity of ore crushed will be 150 tons per diem. The ore runs from \$5 to \$10, gold, per ton, while the cost of extraction and treatment is said not to exceed an average of \$3.50 per ton. Labor and fuel are reasonably cheap and abundant. It is understood that the new company will begin paying dividends either this or next month. The former owners remitted to this city in each of the months of December and Jannary last a gold bar valued at \$36,000. Pamarejo Mining Company.—The directors have issued a circular to the shareholders, showing the necessity of raising \$25,000 by the emission of de-benture bonds to pay off floating indebtedness, leav-ing, subject to the repayment of the Mexican Min-eral Railway Company's portion of the indebted-ness, a total liability of £155,000 in debentures, in-cluding the new issue. This is a heavy load of debt for the property. San Luis Potosi.

for the property.

for the property. San Luis Potosi. Concepcion.—The fire which lately broke out in this mine was conlined to the Pilar shaft which has been abandoned since October last. The smoke which filled the mine produced eight deaths rrom suffoca-tion. None of the other workings collapsed, and no machinery was buried under the débris. The material loss to the company was confined to the stoppage of work for two days.

Mezquital del Oro.—The monthly output is said to be 1,000 oz. of fine gold.

Mezquital del Oro.—The monthly output is said to be 1,000 oz. of fine gold. NOVA SCOTIA. The "Empire," the government organ at Toronto, referring to the purchase of Nova Scotia coal mines by the Whitney syndicate, says: "The iniquitous leg-islation of the Nova Scotia government in the matter of the coal monopoly is not to be allowed to go un-challenged. As the matter now stands the combine has got control of nearly the whole of the coal areas of the East. Great Britain has fortified Halifax harbor, spendling enormous wealth to make it the most strongly fortified roadstead in the world, not even excluding Gibraltar. This has been done to make impregnable the great coaling station of the British fieet on this side of the Atlantic. Take away the coal supply and Halifax harbor will hardly be worth holding. It would largely become a trap instead of a place of refuge and supply. Under the present legislation this coal supply will be con-trolled by a syndicate of aliens. The possibility of the syndicate having it made worth their while to fire every one of their mines in case of an emergency that might easily arise need not be dilated upon. The entire action of the British North Atlantie squadron could be placed at the mercy of these foreign capitalists." North Star Mine, Isaac's Harbor, yielded 150 oz. for 85 tons quartz during January, and 165 oz.

North Star Mine, Isaac's Harbor, yielded 150 oz. for 85 tons quartz during January, and 165 oz. for the previous month.

the previous month. Truro Gold Mining Company.—The mine worked by this eompany has been worked off and on for about 30 years. In October of 1892 Mr. G. W. Stuart became manager, and since then some very good ore has been found. According to his report for the quarter ending December 31st, 1892, 22 tons of quartz taken out by 248 days' work during October yielded 272 oz, of gold. The mine was then shut down while the surface plant was entirely reconstructed. On December 14th mining again commenced and un to the surface plant was entirely reconstructed. On December 14th mining again commenced and up to

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the end of the month 30 tons of quartz were taken out, which produced 750 oz. of gold.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, (olo., Baltimore, Pittsburg, Deadwood, S. Dak.; St. Lonis, Helena, Mont.; London and Paris, see pages 166 and 165.]

NEW YORK, Friday Evening, Feb. 17. The past week in the mining market has been de-void of interesting features. The trading was con-fined to a few stocks, and the volume of business was rather small.

fined to a few stocks, and the volume of business was rather small. The Comstocks closed slightly higher to-day, ow-ing to reports from San Francisco. During the week there were sales of 400 shares of Crown Point at 65@75c. Gould & Curry was stationary at \$1; total sales, 400 shares. Of Hale & Norcross 200 shares were sold at \$1.20@\$1.40. Sales of Ophir amounted to 500 shares at \$2@ \$2.25. Other sales were as follows: 200 shares of Savage, at 95c,@\$1; 100 shares of Sierra Nevada, at \$1.20; 300 shares of Best & Belcher, at \$1.35@\$1.50; 200 shares of Bollion, at 70@73c; 100 shares of Chollar, at 60c.; 4,100 shares Comstock Tunnel stock, 9@10c.; 200 shares of Exchequer, at 33@35c; 200 shares of Julia, at 13c.; 500 shares of Mexican, at \$1.70@\$1.90; 200 shares of Potosi, at \$1.50@\$155; 100 shares of Union Consolidated, at \$1.50@}

Tunnel stock, 9@10c; 200 shares of Exchequer, at 33@35c; 200 shares of Julia, at 13c; 500 shares of Mexican, at \$1.70@\$1.90; 200 shares of Potosi, at \$1.50@\$155; 100 shares of Union Consolidated, at \$1.10. The following Comstock mining companies report h aving had balances on hand January 31st, last, with the mine expenses for that month to be paid: Alta, \$13,279.08; Alpha Con., \$7,655.10, less \$2,500, due on pumping account; Andes, \$3,668.86; Bullion, \$8,765.69; Caledonia, \$668.34; Confidence, \$608.68; Consolicated California & Virginia, \$58,882.21, with part of the assessment advertised delinquent unpaid, the monthly expenses of the mine are unpaid; Con. New York, \$19,790.24, with bullion to be received; Exchequer, \$2.291.19, and \$2.500 due the Comstock Pumping Association; Gould & Curry, \$11,788.76; Kentuck, \$2,813.99 in coin, and \$4,622, the assaved value of unsold bullion; Lady Washington. \$5,217.62; Mexican, \$9,333.42; OccidentalConsolidated, \$3,978.12; Peerless, \$1,118.61; Sierra Nevada, \$8,883.47; Silver Hill, \$1,876.25; Utah Consolidated, \$1,254.85. The following mining companies report having had an indebtedness on January 31st last, with the expenses of that month to be paid, Best & Belcher, \$2,607.73; Belcher, \$12,243.52; Crown Point, \$2,784.75; Chollar, \$3,788.09; Justice, \$1,703.25; Ophir, \$11.800. 79; Overman, \$15,850.78; Potosi, \$30.155.32; Savage, \$8,184.20; Segregated Belcher, \$11,160.71. The following Tuscarora mining companies report having cash on hand on the 1st inst., with the mine expenses for January to be paid; Grand Prize, \$80.44; Nevada Queen, \$102.06; North Common-wealth, \$2,6808.29; Del Monte, \$17,823.43; Inde-pendence, \$470.70; Navajo, \$5,010.61; North Belle Isle, \$6,923.07. Of the California stocks we note sales of 100 shares of Plymouth Consolidated at 55. Belmont was sta-tionary at 20e, with sales of 620 shares. Of Bruns-wiek Consolidated sales amounted to 2,900 shares at 7@10e. The latest letter from the superintendent of this company will be fouud in our mining news colum

of this company will be found in our management columns. The following Bodie mining companies report having had cash on hand on the 31st ult, with ex-penses for that month unpaid: Bodie Consolidated, \$3,762 94; Crocker, \$190.75; Mono, \$3,333.42; Standard Consolidated, \$40,175. The Colorado stocks were very quiet this week. Chrysolite shows sales of 1,200 shares at 21@22c. Leadville Consolidated was stationary at 19c., with total sales of but 1,000 shares. Homestake this week shows sales of 200 shares at \$13.

at \$13. We are in receipt of an advance copy of the finan cial statement of the Horn Silver Mining Company for 1892. During the year payments were as follows: Mining, \$171,065 91: general expenses, \$11,592.93; legal expenses, \$1,174 43; dividends, \$200,000 ; bal-ance cash on hand, \$276,684 31 ; total, \$676,688,60. The receipts were as follows: Cash balance from last annual report, \$275,304.28; ore sales during the year, \$377,025.88; store at Frisco, \$12,517.30; interest account, \$10,018.66; bills receivable, \$1,500; works and plant at Francklyn, \$293.80; sundry amounts, \$8,75; total, \$676,668.69. During the week there were sales of 6,700 shares

\$8.75; total, \$676,668.69. During the week there were sales of 6,700 shares of Monte Cristo at \$3@\$3,15. Of El Cristo sales were 3,800 shares at 40@55c. Phœnix of Arizona shows sales this week of 6,700 shares at 20@25c. A reorganization of the Phœnix Mining Company is to be effected. A committee composed of several well known gentlemen will meet early next week and will devise plans for the reorganization. Advices from the company's mine say that the Marshall mills have proved a failure; the reason why they were receted originally was the insufficiency of funds at the disposal of the company. Under the reorganization an assessment of 15 cents per share will be levicd. Plans will be submitted by 'fraser & Chalmers to the committee for a 100 gravity stamp mill. Next week we shall publish full particulars of the result of the committee's decision.

Boston.

Feb. 16.

THE ENGINEERING AND MINING JOURNAL.

(From our Special Correspondent.) A little better feeling is noticeable in the market for copper mining stocks, although the volume of busi-ness is light and prices have not as yet recorded any material advance. The dividend payers are strong on investment demand and Centennial has shown considerable activity and strength the past few days, on execution of buying orders said to come from the lake, which would indicate that the mine is looking better. The Montana stocks have ruled very dull, but prices have been well maintained and with increased activity would undoubtedly go bigber. copper mining stocks, although the volume of busi very dull, but prices have been well maintained and with increased activity would undoubtedly go bigber. Poston & Montana advanced to \$34½, a gain of the fraction, while Butte & Boston lost ¼ on light trans-actions selling at \$11. Calumet & Hecla advanced from \$305 to \$310 ex-dividend, and held the price. Tamarack also gained \$1, with sales at \$162, and in good demand. Quincy touched \$138, bnt did not hold it, selling later at \$137. Oscoola sold carly in the week at \$36½. Later sales were at \$3714 regular, and \$3714 buyer 60 days. Centennial, as before noted, was the most active stock of its class, and advanced from \$8@\$8% for round lots, and \$9 for 25 shares. Franklin declined to \$13, with a small lot taken to-day at \$134. Kearsarge declined from \$124@\$1144, with very little doing in it. Tamarack, Jr., sold at \$19, same as last week. Wolverine sold up to \$2.50, but lost one-quarter in the later sales. Ridge sold at 27½c. 3 P. M.--This afternoon Centennial declined to \$8.3714, and Osceola sold at \$37.1214, a decline of one-eighth. Nothing doing in silver stoeks.

eighth. Nothing doing in silver stocks.

San Francisco.

San Francisco. San Francisco. The opening quotations to day were as follows: Best & Belcher, \$1.60; Bodie, 5c.; Belle Isle, 15c.; Bulwer, 15c.; Chollar, 55c.; Consolidated California & Virginia, \$2.40; Gould & Chrry, 85c.; Hale & Nor-eross, \$1.30; Mexican. \$1.80; Mono, 5c.; North Belle Isle, 5c.; Navajo, 15c.; Ophir, \$2.10; Savage, 95c.; Sierra Nevada, \$1.25; Union Consolidated, \$1; Yel-low Jacket, 60c.

DIVIDENDS.

American Coal Company, dividend of three per cent., payable March 15th at the office of the com-pany, No. 1 Broadway, New York. Transfer books close February 28th and reopen March 11.

Consolidated New York Mining Company, divi-dend of ten cents per share, \$10,000, was paid on February 15th, at the office of the company, No. 309 Montgomery street, San Francisco, Cal.

Daly Mining Coupany, dividend No. 72 of twenty-five cents per share, \$37,500, payable February 28th at the office of Messrs. Lounsbery & Co., Mills Building, No. 15 Broad street, New York. Transfer books close February 23 and reopen March 1st.

Homestake Mining Company, dividend No. 175 of en eents per share. \$12,500, payable February 25th t the office of Messrs. Lounsberv & Co., Mills uilding, No. 15 Broad street, New York. Transfer ooks close February 20th and reopen February geb Building, No books close

Hope Mining Company paid an extra dividend o fifty cents per share, \$50,000, on February 1st, at the office of the company, room 130, Laclede Building, St. Louis, Mo.

ASSESSMENTS.

COMPANY.	No.	When levied	D'l'nq in office.	Day of sale.	Amt. per share.
Andes, Nev	39	Jan. 21	Feb 24	Mar. 16	.25
Beleher, Nev	45	Feb. 8	8 Mar. 14	April 4	.50
Belle Isle, Nev	17	Jan.	Feb. If	Mar. 8	.10
Best & Beleher, Nev.	53	Jan. 16	i Feb. 21	Mar. 14	.25
Caledonia, Nev	45	Jan. 28	Mar. 2	Mar. 23	.10
Exchequer, Nev	35	Jan, 26	Mar. 1	Mar. 22	.10
El Leopoldo, Mex	2	Jan. 26	Mar. 3	Mar 28	.05
Grav Eagle, Cal	70	Dec. 13	Feb. 6	Mar. 2	.07
Hale & Noreross.					
Nev	103	Jan. 7	Feb. 10	Mar. 3	.50
Independence, Nev-	18	Jan. 27	Mar. 6	Mar. 29	.05
Jack Rabbit, Cal.	2	Dec. 29	Feb. 6	Feb. 28	.05
Justice, Nev	53	Jan. 6	Feb. 9	Mar. 2	.10
Morgan, Cal	16	Jan. 28	Mar. 6	Mar. 30	.10
Navajo, Nev	24	Jan. 9	Feb. 13	Mar. 7	.10
Nevada Queen, Nev	53	Jan. 16	Feb. 21	Mar. 14	.25
North Belle Isle.			1		
Nev	22	Jan. 26	Mar. 3	Apr. 3.	.10
North Common-					
wealth, Nev	4	Jan. 24	Mar. 2	Mar. 7	.10
Overman, Nev.	66	Jan. 10	Feb. 14	Mar. 36	.25
Seg. Belcher &					
Mides Nev	11	Jan. 8	Feb. 7	Feb. 27	.25
South Eureka, Cal.	2	Jan. 4	Feb. 10	Mar. 6	.02
West Con. Va. & C.	-				
Nev	1	Jan. 19	Feb. 23	Mar. 15	.25

MEETINGS.

Golden Treasure Mining Company, at the office of the company, room 506, Mining Exchange Building, Denver, Colo., March 10th, at 2 P.M.

METAL MARKET.

NEW YORK, Friday Evening, Feb. 17, 1893.

	Pr	ices o	of SII	ver	per O	unce	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
11 13 14	4 8734 4 8734 4 8734 4 8734	3818 3818 3818	831/2 831/2 835/8	*636 *636 *637	15 16 17	$\begin{array}{r} 4.881/4 \\ 4.881/4 \\ 4.881/4 \\ 4.881/4 \end{array}$	383/8 3876 3872	83 3 4 837/8 843/8	638 639 641

Silver during past week has improved under a steady demand. Shipments have not been large, but there has been a further decrease of the stock in sight, which has been carried for some time awaiting a higher market. Government purchases have been very liberal, having amounted to an average of over two hundred thousand ounces per day so far this month. The United States Access Office at New York re-

The United States Assay Office at New York re-ports the total receipts of silver for the week to be 168,000 ounces.

Government Silver Purchases.

The government has purchased during the week the following quantities of fine silver at the accom-panying prices per fine ounce : February 13th, 250,000 oz., at 83 95@84*15c. February 15'h, 271,000 oz., at 84 15@84*4c. February 17th, 650,000 oz., at 84 6c.

Gold and Silver Exports and Imports at New York for Week Encing February 11to, 1893, and for Years from January 1st, 1893, 1892.

	Go	ld.	Silv	Excess	
	Exports.	1mports.	Exports.	Imports.	Exports.
Week 1893 1892	\$3.264 762 18,009,322 863,7.2	\$28,832 123.896 1,688,634	\$817,253 3,848,387 3,465 102	\$147,476 412,137 169,100	\$3,905,707 21,302,476 2,471,090

During the five days ending February 17th, the exports and imports, so far as ascertained, have been as follows: Exports, gold, \$1,650,205; silver, \$247,305. Imports, gold, \$7,468; silver, \$68,195. Of the gold exported \$1,500,000 went to Bremen, the rest to South America and the West Indies. Of the silver, nearly all went to England., It is expected that \$1,500,000 in gold will be sent out on Saturday, although it has not yet been de-manded at the Sub-Treasury.

NOTES OF THE WEEK.

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tenders.

At present the Treasury holds only \$108,000,000 in gold to protect or redeem \$357,000,000 in legal tenders and \$129,000,000 in Treasury notes. Senator Sherman has introduced in the Senate a bill authorizing the issue of 3% five year bonds for resumption purposes. The bill is timely, as it not only settles the question of legality, but will save-the government some money, as under the Resump-tion Act only 4% bonds can be issued. The bill should be passed, but it is rumored that some of the pro-silver senators are against it and will take active measures to prevent its passage.

The bimetallists of Europe are making some head-way, and are looking forward to the May meeting of the International Monetary Conference. The proceedings of the Brussels meeting will be venti-lated in the House of Commons on the 23th inst. The Viceroy's speech at Calcutta, in rcply to the complaints of the civil servants, seems to point to speedy action with regard to the rupee; but it is admitted on all hands that the silver crisis is not confined to India or to Indian commerce.

M. Boissevaln, one of the Dutch delegates, has published a pamphlet in which he maintains that the conference was really fruitful of results, and that the resolution to adjourn until May was something more than a mere formality.

At a recent meeting of the French Agricultural Society a resolution was adopted in favor of con-certed action with foreign agricultural societies to secure free coinage in all countries.

secure free coinage in all countries. In a recently published Blue Book, entitled "Account Relating to the Trade. Etc., of British India," we learn that during the nine mouths ending Octo-ber 31st, 1802, India imported \$2,812,105 in gold and exported gold to the extent of \$10,389,858, gainst imports of \$9,147,816 and exports of \$1,908,360 during the same period of 1891. The movement of silver was as follows: Imports, \$26,221,206; exports, \$6, 002,993 in 1892, against imports of \$14,033,505, and ex-ports of \$3,150,450 in 1891.

Domestic and Foreign Coln.

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

	Bid.	Aske
Mexican dollars	\$.66	\$ 60
Peruvian soles and Chilian pesos	.601/2	.6)
Victoria sovereigns	4.87	4.85
Twenty francs	3.86	3.8
Twenty marks	4 74	4.78
Spanish 25 pesetas	4.80	4.85

The amount of copper produced in the United States during the month of January, 1893, was in tons of 2,240 lbs.) 10,176 tons. The foreign mines reporting, which include all the large European concerns, produced 5,736 tons. The exports from the United States in January amounted in fine copper to 3,17 tons.

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

opper Matte. 3,971 bags 2,126 2,229 "	Lbs. 427,931 233,860 239,876	\$21,000 10,040 10,000
Copper. 255 pigs 80 bols.	77,658 100,000	\$25,000 12,000
Copper. 36 bbls.	45,000	\$5,625
Copper 610 pigs 54 bbls. 804 pigs	$173,506 \\ 67,500 \\ 227,618$	\$18,000 8,100 23,000
	opper Matte. 3.971 bags 2.126 ** 2.229 ** Copper. 255 pigs 80 bols. Copper. 36 bbls. Copper. 610 pigs 54 bbls. 804 pigs	opper Matte. Lbs. 3.971 bags 47,931 2.126 233,860 229,876 2.229 239,876 259,876 Copper. 255 pigs 77,658 80 bols. 100,000 Copper. 36 bols. 45,000 Copper. 610 pigs 173,506 74 bols. 67,500 804 pigs

292 7s. 6d. for three months. Lead shows continued firmness, and in spite of the rather high prices now established offers from the West are rather scarce, and it proves without any doubt that production is falling off quite considera-bly. On the other hand, huyers are not very eager, or otherwise prices would be advanced. We have to quote 4 cents. The English market has been rather flat and prices for Spanish lead have declined to £9 8s. 9d @29 10s.-or the lowest price ever reached. Some business has been done in English lead at £9 8s. 9d., but it is mostly held for £9 11s. 3d., at which price there remain scllers. *Chicago Lead Market.*-The Post Boynton Strong

Chicago Lead Market.—The Post Boynton Strong Company telegraph us as follows: The market has ruled steady at 380c. asked. Latterly offerings were made at 375c. hy outside operators, and the market closes at 375 asked. The sales for the week foot up 200 tons.

St. Louis Lead Market.—The John Wahl Commis-sion Company telegraph us as follows: Lead con-tinues strong and prices remain unchanged. Chemi-cal desilverized and soft Missouri are worth 3 70c., hut no more; owing to light offering, transactions for the week are limited."

Spelter does not show any change and is quoted at 4.32%(@4.35). For forward delivery, higher prices are asked as producers firmly believe in higher values. In London the market is lower, ordinaries being quoted at £16 17s. 6d. and specials at £17.

Autimony continues very dull. Cookson's quote at 10% c., L. X. 10% c., and Hallett's 10c. Nickel is lifeless, with the quotation unchanged at 48@52c.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, Feb. 17, 1893. NEW YORK, Friday Evening, Feb. 17, 1883. **Pig Iron Production**.—The following table gives the number of furnaces in blast and the estimated production of pig iron in the United States during the week ending February 11th, 1892, and for the cor-responding week ending February 11th, 1893. Also the total estimated production from January 1st of each year to these dates. The figures are in gross topost

tons : Pig Iron Production During Weeks Ending

February 11th, 1892, and February 11th, 1893, and During Both Years to These Dates.

Fuel used		Week	ending	3	From	From
- ucr uoru.	Feb. 1	1, 1892.	Feb.	11, 1893.	Jan., '92.	Jan.,'93.
Anthracite. Coke Charcoal	F'cs. 94 164 55	Tons. 35,970 138,990 11,820	F'cs. 70 137 39	Tons. 32,600 131,600 8,900	Tons. 233,820 833,940 70,920	Tons. 196.000 789,600 53,400
Totals	313	189,780	246	173,100	1,138,780	1,039,000

Totals.... Prices: Southern, ex-stcamer No. 1 F., \$15.26; No. 2 F., \$14.26; No. 3 F., \$13.76; Gray Forge, \$13.01, Northern, tide water, No. 1 X, \$15; No. 2 X, \$14; No. 2 plain, \$13.50; Gray Forge, \$13. Southern irons are quoted, nominally, 26c. higher than Northern.

Spiegeleisen and Ferromanganese.—Ferro, \$56,25@\$56.75. Spiegel, \$25.50@26.

Steel Rails.-Quotations are still \$29. Rail Fasteniugs, -Prices rule as follows: Fish and angle plates, 1:55@115c, at nill; spikes, 1:90@ 2c.; bolts and square nuts, 2:40@2:70c.; hexagonal nuts, 2:70@2 S0c. delivered.

Merchant Iron and Steel.—Prices stand. Merchant Iron and Steel.—Prices stand. Mushet's special, 48c.; English tool steel, 15c. net, American tool steel, 6½@7½c.; special grades, 13@. 18c.; crucible machinery, 2*25c.; open hearth spring, 2*30c.; tire steel, 2*25c.; toe calks, 2*25@2*5Jc.; first quality sheet, 10c; second quality sheet, 8c. Structural Iron and Steel.—We quote : Beams, 2*3@2*55c., except for 20-in. beams which are 2*75c. angles, 155@2*15c.; sheared plates, 190@2*10c.; tees; 2*30@2*60c.; channels, 2*35@2*50c.; universal plates, 2@2*10c.; bridge plates, 2@2*10c.; steel hoops, 1*90@ 8c. All on dock. Buffalo. Feb. 16.

Buffalo.

Feb. 16.

(Special Report by Rogers, Brown & Co.) Some few sales have been made during the week but the market unquestionably is to be character-ized dull, Consumers generally are melting iron liberally, but seem to have largely ahandoned for the time being the purchase of round lots. Prices con-tinue weak tinne weak.

time weak. We quote on the cash basis f. o. b. cars Buffalo : No. 1 X foundry strong coke iron, Lake Superior ore, \$15.00; No. 2 X foundry strong coke iron, Lake Superior ore, \$14; Ohio strong softener No. 1, \$15; Ohio strong softener No. 2, \$14; Jackson County silvery No. 1, \$17@\$17.30; Jackson County silvery No. 1, \$17@\$17.30; Jackson County Silvery No. 2, \$16.30@\$16 80; Lake Superior charcoal, \$17.25; Tennes-see charcoal, \$18; Southern soft No. 1, \$13.90 @\$14.15; Alabama car wheel, \$19; Hanging Rock charcoal, \$20.50. Chicago. Feb. 16.

Chicago. (From our Special Correspondent.)

Chicago. Feb. 16. (From our Special Correspondent.) There is now no question that there is already in progress a large huying movement in crude iron, which should and probably will continue for some cime, unless checked by adverse legislation or finan-cial disaster. Of this there is little apprehension. The nature of the inquiry for steel rails here is such that the mills feel confident of eutering a larger tonnage than last spring. Steel rail makers east of here have secured a very large amount, and it will be only a question of a short time when the trunk lines of the Northwest will cover their requirements, which must necessarily be greater than a year ago. Bessemer pig has already advanced, steel hillets likewise, and it now looks though other finished material made of yof a few hundred tons of billets here was referred to an Eastern mill, which declined to sell at open quotation, stating they could do much hetter by vurning it into the finished product. For this reason and other incidents which have been noticed, there is reason to believe that the turn has been made. The impression gains among buyers of Northern thy; the amounts sold have been larger, less effort he impression gains among buyers of Northern upular, that the met 'l is low enough, and no mistake will be made in placing yearly contracts at eurrent

rates. Transactions have been large, varying from 500 to 1,500 tons and upwards, deliveries extending through the year. Lake Superior charcoal iron has also shown more activity for large as well as small lots. Agents for Southern coke iron report a good demand, and several contracts of 1.000 ton lots have been placed during the week at prices satisfactory to buyer and seller. Inquiry continues good, and consumers are increasing the size of their orders; in other words, the hand-to-month tuying would seem to be a thing of the past. The market bears the appearance of being healthy, and a substantial business is promised, for a while at least. Quotations per gross ton f. o. b. Chicago are : Lake Superior charcoal, \$16.07@\$17.25; Lake Superior coke, No 1, \$13.50@\$14.50; No. 2, \$13.00@\$13.50; No. 3, \$12.75@\$13; Lake Superior Bessemer, \$14 25; Lake Superior Scotch, \$14.25@\$1175; American Scotch, \$16 25@\$17; Sonthern coke,fonndry, No.1, \$14.25; No. 2, \$13.35; No. 2, \$13.00; Sonthern coke, soft, No. 1, \$13.35; No. 2, \$13.00; Onlio silveries, No. 1, \$17; No 2, \$16.50; Ohio strong softeners, No. 1, \$17; No 2, \$16.50; Ohio strong softeners, No. 1, \$17; No 2, \$16.50; Sonthern coke, appeared, No. 1, \$17; No 2, \$16.50; Sonthern coke, 20@\$21.

Steel Billets and Rods are nominally unchanged at \$23.50@\$32.50 respectively.

structural Iron and Steel.—There is a good in-quiry from Western and Southwestern cities, and mill- in this vicinity look for a good tounage this month. The Medinah Temple Building will require 1,000 tons of skeleton steel structural work and the contracts will be let this week. Quota-tions, car lets, f. o. b. Chicago, are as follows : Angles, \$1.90@\$2; tees, \$2.15@\$2.25; universal plates, \$1.95@\$2; sheared plates, \$1.95@\$2; beaus and channels, \$1.95@2.25.

channels, \$1.95@2.25. Plates.—Demand is generally fair from all con-sumptive points, but deliveries continue slow from mii's. Steel sheets, 10 to 14, \$2.30@\$2.40; iron sheets, 10 to 14, \$2.20@\$2.30; tank steel, \$1.90 @\$2; shell iron or steel, \$2.50@\$2.75; firebox steel, \$4.25@\$5.25; flange steel, \$2.75@\$3; boiler rivets, \$4 @\$4.15; boiler tubes, all sizes, 60%. Merchant Steel.—The volume of trade is surpris-ingly large not only from the implement iden, but also from railroad shops and general consumers. Manufacturers are well satisfied with the conditions of business. Quotations are: Tool steel, \$6.50@\$6.75 and upward; tire steel, \$2@\$2,1'; toe calk, \$2.30@ \$2.40. Bessemer machinery, \$2.10@\$2.20; Bessemer bars, \$1.70@\$1.75; open hearth machinery, \$2.30@ \$2.40; open hearth carriage spring, \$2.10@\$2.20; cru-cible spring, \$3.75@\$4. Galvanzed Sheet Iron.—Local business is light.

Galvanized Sheet Iron.—Local business is light, but outside trade is all that could be desired. Dis-counts are easy at 70 and 10% off on .lnniata and 70 and 15% off on charcoal, and jobbing quantities at 70 and 5\% off on the former and 70 and 10% off on the latter.

Black: Sheet Iron.—Inquiry from jobbers is improving and general demand better, but prices less strong. Quotations on iron sheets are 2°5°c, for No. 27, common: steel sheets are 2°5°c. Jobbers quote 3@310c. for iron and 3°10%305c. for steel, same gauge.

gauge. Bar Iron.—Demand for January and the first part of February was light, but there is now quite an improvement in both common and best grade iron, but large orders are still scarce, yet prices are somewhat stiffer. Mill lots are quoted at 155c. Chicago, with half extras, and 1656(170c. from store according to quantity.

Somewhat sinfer. Min fors are quoted at 155c. Chicago, with half extras, and 1'65(a)170c. from store according to quantity. St*el Rails.—The local mills, while so far unable to report any round blocks of standard sections, have booked sufficient tonnage to make them more confident of the very near future when they look for larger orders predicated on the character of the inquiry now being received. The requirements of Western roads will be larger, especially so for renewals. Quotations are \$30(a)2 according to quantity. Other track material is dull at 1'65(a) 170c. for iron and steel splice bars; track bolts, square nuts, 2'55c; hexagon, 2'65c:spikes, 2'05(a)2 loc, according to style. Nails,—Wire nail manufacturers have advanced

according to style. Nails.—Wire nail manufacturers have advanced the price from \$1.55 to \$1.57½ in mill lots, Chicago delivery, and demand is fair. The action of makers in insisting on immediate specifications on contracts is nearly as good as an advance of 5c, per keg. Steel cut nails are in very moderate demand and \$1.60 is easily shaded on 30c, average. Jobbers quote both kinds at \$1.65@\$1.70 according to quantity. Soran.—Wrought grades are in better inoniry.

Strap. –Wrought grades are in better inquiry. Scrap. –Wrought grades are in better inquiry, but prices show no improvement. Railroad, \$15 50; No. 1 forge, \$15; No. 1 mill, \$9.50; fish plates, \$16.50; axles, \$19; horseshoe, \$16; pipes and flue-, \$7; cast borings, \$6; wrought turnings, \$5; axle turnings, \$9.50; machinery castings, \$10; stove plates, \$6.50; mixed steel, \$10.50; coil steel, \$15; ieaf steel, \$15.50; tires, \$14.50.

Old Material.—One thousand tons of iron rails were sold in this vicinity, \$18.75, equal to \$18.50 here Steel rails show hut little inquiry at \$11.25@\$13.50, as to condition, etc. Old car wheels. are in better demand; 1,000 tons were sold at \$14.65.

Louisville. Feb. 11.

(Special Report by Hall Brothers & Co. There is really nothing to be said about the mar-ket that will materially differ from reports for the past two or three weeks. Quietness is the most prominent feature, and prices remain nominally un-

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changed, but it is reported that concessions are ac-cepted by several of the producers who have dis-played considerable anxiety to add new orders to their books. In some localitles there has been con-siderable accumulation of stocks, and on this greater concessions can be had for immediate delivery con-tracts, but the trade is slow to take hold of this kind of contracts in consequence of already having liberal supplies on hand for nearby wants.

Hot Blast Foundry Irons.—Southern coke No. 1, \$13.50@\$13.75; Southern coke No. 2, \$12.50@ \$12.75; Southern coke No. 3, \$12@\$12.25; Southern charcoal No. 1, \$16@\$17; Southern charcoal No. 2, \$15.50@\$16.

Forge Irons.—Neutral coke, \$11.50@\$12; mottled, \$11@\$11.25.

Cur Wheel and Mulleable Irous.-Southern (standard brands), \$20@\$21; Southern (other brands), \$18.50@\$19.50; Lake Superior, \$19.50@\$20.50.

Philadelphia.

Feb. 17.

(From our Special Correspondent.) **Pig Irou.**—The placing of large orders for finished material and the strong probability that other large orders will soon be placed have indirectly strength-ened the pig iron market, though without actually increasing demand or increasing prices. The im-proved tone will create a demand for several, per-haps all, of the special brands. The increased use of crude iron as the spring approaches cannot but have a favorable effect on prices, at least to the extent of a withdrawal of some very low quotations which forbid margins over cost at present. No 1 averages \$15; No. 2, \$14@\$14.50; forge, \$13@13 25. Muck Bars.—Very little husiness indeed is trans-acted, but mill men are soliciting business. Billets.—As usual, a good business is being done (From our Special Correspondent.)

Billets.—As usual, a good business is being done in small lots, but buyers refuse to accept invitations of manufacturers to place March and April orders to discount an advance. The probabilities are that much heavier orders will soon be placed.

Merchant Iron.—It is impossible to discover any improvement. Iron is selling in small lots all the way from \$1.50@\$175, and as there is much work in sight the mill men feel that they will have more to do in a short time.

Nails.—As building operations increase the de-mand for nails improves, but prices are quite weak. Skelp.—A good run of orders at 1.55.

Wrought Iron Pipe.—A good order plays havoc with discounts which are made a football of. Some business is coming in, but there is no steadiness to trade or prices.

Sheet Iron.—This branch of the iron trade is quite active and orders flow in with regularity. Prices are quite well maintained.

Plate and Tank.—Large orders have been placed, one of which went to Pittsburg. Negotiations are well under way for about 14,000 tons of plates, which will, without doubt, be placed in Pennsylvania mills.

Structural Material.—The previous bright and encouraging condition of things exists and orders, big and little, are dropping in every day or two at prices which have become familiar to the trade.

steel Rails.—The long-talked-of order of 40,000 tons was placed by the New York Central. Other small orders aggregate for week 15,000 tons. Two other orders will be placed this week amounting to 8,000 tons. Rail makers are feeling much more hopeful. Quotations, \$29.

Old Raits.—Liberal supplies for March and April delivery are offered at \$18@\$18.50, holders' hands. Scrap.—Considerable No. 1 scrap is offered for Spriug delivery and brokers are offering to deliver at 30 and 60 days, at \$16@16.50.

Pittsburg. Feb. 16.

(From our Special Correspondent.)

Pittaburg. Feb. 16. (From our Special Correspondent.) Taw Iron and Steel,—Trade in certain descriptions of material shows a reasonable amount of activity. The discovery that stocks of Bessemer pig and a furnaces created an increased demand, and better prices were the rule for early delivery. Many furnaces have orders booked that will keep them busy for some time. In pig iron, generally, the situation is fairly satisfactory, although there are complaints that some iron is pressing the market. Standard brands are in good demand and prices generally find what he wants, in some cases at a slight shading of prices; still there ris always some iron offered at a bargain, and of contracts since the first of the month for 30,000 tons, making a total of 90,000 tons. There also reports in circulation that several wester for 70,000 tons, and a later one for 30,000 tons, making a total of 90,000 tons. There also reports in circulation that several wester for the market, so that the trade through the country is regarded as being in much better part dealer on the situation: Al the best who shops are not be situation. A leading of prices is the prices of material; these facts will give strength whet he to the market, so that the the threade through the country is regarded as being in much better part dealer on the situation: Al the best best is the prices are to be prices and if what the trade show the best and the secure at low prices, and if what the trade through the manufacturers will escape actual loss in some of the recent transactions. Be that it may, prices are certainly very low, and,

while it seems impossible for them to go lower, manufacturers are evidently shaping their affairs as though they had no imme-diate expectation of anything better than current quotations. As a matter of fact engagements have been made for deliveries covering from six to nine months ahead, but still larger sales would be made on similar terms if consumers felt inclined that way; but the limit seems to be fixed by buyers rather than sellers. Since our last report—besides the shipyard orders, one for 8,000 tons light steel plates, Pittsburg in this case being the successful competitor. The statistical situation continues favorable. Weekly capacity February 1, 171,451 tons; as com-pared with January 1, a decrease of 1,917 tons. Consumption has kept abreast of the production. The stocks of sold and unsold [pig held by the fur-naces show a decrease on the 1st of February of 6,781 tons. Structurnl Material—It cannot be said that the

6,781 tons.
Structural Material—It cannot be said that the marken is any better, notwithstanding the recent beave engagements. Immediate specifications are what the mills are after, and any buyer with a fair sized order of this kind can command low figures. A considerable amount of material is being called for by the smaller class of consumers, but the capacity for production is so large that everything that comes in seems to be absorbed without affording any perceptible relief to the general demand for "more." The present rates f. o. b. at works : Angles, 1:80@1.85c.; tees, 2:15c.; heams and channels, 2:10@2.20c. base; sheared bridge plates, steel, 2:00c.; universal mill plates, steel, 1:95c.; tenn, 1:90c.; refined bars, 1:75c. base.
Steel Rails.—The placing of several good sized

Steel Rails.—The placing of several good sized orders has caused a better feeling; the rates are \$29 f. o. b. at maker's works. Prices since our last have undergone scarcely any change. The volume of sales was liberal, partic-ularly Bessemer and soft steel. We are reported the following:

		Coke Smelt	ed La	ke una	l Nati	ve Ore.		
000	Tons	Bessemer, A	April.	May,	June.	\$	13.40 cash.	
500	Tons	Bessemer, F	eb., M	arch			13.50 cash.	
000	Tons	Bessemer, M	larch,	April			13.50 cash.	
600	Tons	Bessemer,	promp	t			13.50 cash.	
000	Tons	Bessemer,	Feb.,	Marel	h		13.56 cash.	
000	" ons	Bessemer, N	larch.	April			13 40 cash.	
000	Tons	Bessemer, I	'eb., 1	March			13.50 cash.	
000	Tons	Grey Forge.					12.25 cash.	
000	Tons	Mill Iron					12.25 cash.	
000	Tons	Grev Forge.	all or	e			12.50 cash.	
000	Tons	Grev Forge	allo	re			12.75 cash	
500	Tons	Gres Forge.					12.25 cash.	
500	Tons	Grev Forge.					12.35 cash.	
500	Tons	No. 1 Found	lry al	1 ore			14.75 cash	
500	Tons	Mill Iron					12.25 cash.	
500	Tons	Bessemer.					13.50 cash.	
250	Tons	No. 1 Found	TV.				14.00 cash	
250	Tong	No 2 Found	rv				13.00 cash	
409	LOING	NO. & LOUNC	Cha	renal			10.00 0454.	
100	Tons	Cold Blast	Circu	reour.			95 50 coah	
100	Tone	Cold Bleat					26.50 cash.	
75	Tong	No 9 Found		• • • • • • •			18 50 cash.	
75	Tong	No. 2 Found	1 y	•••••			18 95 oach	
50	Tona	Foundary	15	•••••			20.50 cash.	
90	rous	Foundry	E Contraction	Silicto	and s	Jaha	20.30 cash.	
000	Tong	Dillota City	funn	and d	ana A	ad.	9) 95 oach	
000	Tons	Dillots and S	laba	ace, u	enver	cu	22.20 Caeu.	
00.0	Tons	Diffets and S	Ech.	next a	null of		22.00 cash.	
500	Tons	Rou Differs,	reo. a	and A	pru, a		21.50 Cash.	
000	Tons	Dillotins, reo	lishe.	Eab	Manah		21.75 cash.	
000	Tons	Billets and a	siaos,	reo.,	March		21.75 Cash.	
100	Tons	Dillata al	onta.		• • • • • •		22 00 cash.	
900	Tons	Binets, 272 a	Mue	k Bar			24.50 Casn.	
500	Tons	Neutral, Fel					24.35 cash.	
500	Tons	Neutral, Fel	b				24.25 cash.	
350	Tons	Neutral					24.25 cash.	
200	Tons	Neutral					24.40 cash	
			Iron	Skelp.				
520	Tons	Sheared					1.7216 4 m.	
200	Tons	Narrow Gro	oved				1.5216 4 m.	
380	Ton	Wide Groo	ved				1.5216 4 m.	
000			Steel	Skeln.				
300	Tons	Wide Groov	ed	Succept			1.45 cash.	
000	- 0140	Fer	ro. Me	inaan	0.9.0		ATTO COOL	
179	Tons	80 ner cent	deliv	ered			59 40 cash	
100	Tons	S0 per cent	dente				50 95 cash	
100	1011	Steel Wire	Rode	5 Gan	ne An	erican	ov. ao cabu.	
850	Tone	5 gougo Am	orioan	o trun		ner wun	30.00 oach	
000	10115	Bloome	Rillet	at in	Bar I	Inde	Jui vu casii.	
800	Tone	Dillote and	Dan L	nda	Duri	inus.	15 95 oneh	
500	Tong	Dillets and I	lon Fr	nus			15.00 cash.	
300	10118	Diffets and 1	Shoef	Dama		• • • • • • • •	10.00 caen.	
200	Tone	Shoot Dana	at mai	Durs.	•		97 50 ooch	
300	1008	Old In	at 1111	J Cher	Dan.		41.00 cash.	
000	Tone	Stool Mired	I and	the steel	null	5.	15.00 ooch	
500	Tons	Steel Mixen	Leng				10.00 cash.	
500	TONS	American	5, 101	ingeto	wn, de	54	19.00 cash.	
900	ions	American T	8,	11.1.			19.20 cash.	
=00		N. ID S	rap I	uateri	al.		15 50	
200	Tons	NO. 1 R. R.	W . SC	rap, n	et		15.50 cash.	
500	Tons	Cast Scrap.	gross				12.00 cash.	
300	Tons	wrought T	irning	8			11.00 cash.	

COAL TRADE REVIEW.

NEW YORK, Friday Evening, Feb. 17th. PRODUCTION OF BITUMINOUS COAL for week ending February 11th and year from January 1st: EASTERN AND NORTHERN SHIPMENTS.

1	893.	1892
Week.	Year.	Yea
2,923	16,350	10.26
71,440	355 967	381,60
1,786	10,068	28,6
17.620	89,821	71.84
87,121	461.600	455,20
27.584	119,307	137.87
30,787	295,460	275.68
60,014	285,664	303,02
67,511	363,947	269,20
366.786	1,998,187	1.933.40
	Week. 2,923 71,440 1,786 17,620 87,121 27,584 30,787 60,014 67,511 366,786	1893. 1993. 1993. 1994. 1994. 1994. 1994. 1994. 1994. 1995. 19

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*** 10*10 1 20 202 **	CALLER DUCKERS	E -0.9	
		93	1892
Pittehurg Pa	Week. 25.710	Year.	Year.
Westmoreland, Pa	39.434	218.003	213,556
Monoligancia, ra	00 707	475 070	494 615
Totais	82,190	\$17.210	454,010

WESTERN SHIPMENTS

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending February 11th, 1893, and year from Jan-uary 1st, in tons of 2,(0) 1b.: Week, 111,179 tons; year 637,186 tons; to corresponding date in 1892, 725,106 tons. Statement of shipments of anihracite coal, (approximat ed) for week ending February 11th, 1893, compared with the corresponding period last year:

	Feb. 11, 1893.	Feb. 13, 1892.	Diffe	rence.
Wyoming region	486,233	386,737	Inc.	99,496
Lehigh *	127,946	120.540	9.6	7,406
Schuylkill "	230,650	258.784	Dec.	28,134
Total	844,829	766,061	Inc.	78.768
Total for year to	4 400 400	1.051.000	Dee	

date..... 4,426,433 4,354,666

Anthracite.

Anthrachte.Reports are current as to the cutting of prices,
for hymors are not only hard to trace, they are
the hard to the here hard, on what class to
the hard to be bought for less than full circular
the hard to be ha

	Broken.	Egg.	Stove. C	hestput.
Hard White Ash	\$4.10	\$1.50	\$4.75	\$4.65
Free " " …	. 4.00	4.10	4.75	4.65
Shamokin		4.60	4.95	4.65
Schuylkill R. A		4.65	5.10	4.90
Lorberry		4.65	5.10	4.90
Lykens Valley	. 5.10	5.65	6.15	5.25

The coal shipping piers of the Philadelphia & Reading Railroad Co. at Port Reading, three miles north of Perth Amboy, are now open for regular business. They were begun in 1891 and the first coal was shipped from them in December, 1892. The length is 2,400 ft.; width, 65 ft.; height at water fr. nt, 43 ft., and length from chutes to end of pier, 825 ft. At present 600 cars can be accommodated, but extensions now in progress will, when com-pleted, enable the road to handle 1,000 cars in the yard. There are 24 loading chutes and 20 ft. of water at low tide. Another great adjunct to the trade is thus fin-ished, for 5,000 tons per day can be handled at the Port Reading piers, and will surely have an effect upon the coastwise traffic. The full report of the Delaware & Hudson for 1892

upon the coastwise traffic. The full report of the Delaware & Hudson for 1992 has been issued. During the year it produced 4,396, 852 tons of coal, carried 6,225,295 tons, sold coal to the value of \$9,854,422, and had on hand Decem-ber 31st, coal to the value of \$856,732. The report shows an increase over 1891 of coal produced 423,566 tons; coal carried, 722,482 tons; sales, \$7,280,308. The value of the coal on hand decreased \$225,090. The lowger the great combine endures the plainer

Ine value of the coal on hand decreased \$225,090. The longer the great combine endures the plainer does it become that the Reading has not realized as much as the other roads, and that the Jersey Central held the bag in the snipe hunt. The report of H. McDonald, inspector for the third anthracite district, Pa., has just been made. The production, gross tons, was 7,549,605, as against 6,125,009 in 1891 and 5,229,027 in 1890. The number of days worked was 197 in 1892 and 194 in 1891.

194 in 1891. The full report has not yet been forwarded to us. so that we can submit only this brief abstract of what will be an important contribution to the cur-rert history of anthracite mining. This is the Wilkes-Barre District, and the report will probably be full of interest to miner, shipper and dealer. There is very little apprehension in the trade as to the MacMahon coal bill, allusion to which was made in our market report of February 4th. No well informed person seems to think that it has a ghost of a chance of passing the legislature. How-ever good may have been the intentions of the framers of the bill, in its practical operations it would disorganize the coal trade and introduce into

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State politics one of the most harmful elements pos-sible to imagine. The State has no more right to regulate the price at which coal shall be sold than the price at which flour, or grain, or molasses, or any other article of common use.

Bituminous.

Any other article of common use, **Bitnminous**. The Ohio coal operators have taken steps to or-granize an association for fixing and maintaining prices. It is not their intention to form a selling as-sociation. The plan, so far as it has come to light, seems to be based on that of the former American Coal Association, which was very powerful up from 1887 to the close of 1891. A committee, consisting of R. H. Johnson, of the Columbus & Hocking Coal and Iron Company; W. S. Courright and Thos. Johnson, of the New Pittsburg, and H. D. Turney and J. E. Martin of the Sunday Creek Coal Com-many, was appointed to report a feasible plan for or-ganization to a sub-sequent meeting. Now if the combine among the soft coal men of the Atlantic slope will take visible shane and mean-ing we will have a lively time of it. With the big authracite combine still in power, the combine in Ohio and on the seaboard, we will have enough to do to look out for fuel at prices that are within reach of ordinary folks. The anthracite combine scems to have been de-signed to mine, hant and sell anthracite coal, the Ohio eembine will contine itself, so it says, to "fix and maintain prices," and we suggest to the sca-board operators that they combine to sell coal at a cheaper rate than it has ever reached in this cour-try. Really, there is nothing else left for them to combine for, if we except this. Let them agree among themselves to combine in the interests of those who burn coal, and we will promise such a volume of trade as has never been seen. Whatever disposition there may ouce have been

volume of trade as has never been seen. Whatever disposition there may once have been to leave the Norfolk & Western R illroad Company out of the projected agreement is likely to be revised under the showing it made last year with its 3,000,-000 tous of coal hanled. It is barely possible that the Norfolk & Western will not be left ont, especially in view of the fact that it has a strong firmenial backing and hauls a first class coal to one of the best harbors on the ceast.

tirst class coal to one of the best narvors on the coast. The West Virginia Central & Pittsburg Railway Company will be in a position some day to have a say in the coal market, if reports are true. These are that it will build an extension from Cumberland to Hagerstown, where it will connect with the Cum-berland Valley Railway, controlled by the Pennsyl-vania. The plan would give the Pennsylvania ad-ditional support in its efforts to secure a big share of the nie that is passing around. Some of the big roads are mancenvring for posi-tion just now, so as to be able to command a strategic point when the real stranggle comes. Charter rates from New York to Boston are 75 to

Charter rates from New York to Boston are 75 to 90 cents, and to Rhode Island 75 cents.

Feb. 16.

Boston.

Boston. Feb. 16. (From our Special Correspondent.) The demand for hard coal is much better than it was, not because coal is wanted any more, but that there is more to be had and there is more moving. The demand, however, is not as extensive as one would expect, considering the small stocks that are held by dealers. The latter are evidently waiting for the opening of spring prices. How low the latter will be is a matter of much speculation. Some ex-pect to see a reduction of about 25c, per ton on pres-ent prices, while there are others who think no change will occur, as the combination has a firm grip on the market and can ask whatever prices it sees fit. Until dealers know what the opening spring prices are really going to be there will not be much huving. The prices quoted here are net f. o. b. New York, free burning stove, \$4.75; egg, \$4.40; free broken, \$4.00; chestnut, \$4.65; Lykens Valley (at Philadel-phia), hoken, \$4.85; egg, \$5.45; stove, \$6.00; chest. The price and market is active and firm: there is

phiai, broken, \$4.85; egg, \$5.45; stove, \$6.00; enest-nut, \$5.00.
The soft coal market is active and tirm; there is still considerable difficulty in getting coal. The demand is "ery apt to be very firm and the demand very good for some time to come. George's Creek coal here is worth from \$4.50@\$475. Clearfield is strong at \$4.00. West Virginia coal bring from \$4.25@\$4.50 per ton on cars here.
Freight rates are still very firm. In a retail way trade is but moderate. The retailers reduced prices on soft coal 50 cents per ton this week, making the market \$4.50. A reduction in anthracite coal is also expected very soon. This is due to the decline in freight rates are stove, \$7.00; nut, \$7.00; egg, \$6.75; furnace, \$6.50; Frankliu, \$8.25; Lebigh egg, \$9.00; Lebigh furnace, \$6.75; bituminous, \$4.50.
Butfalo. Feb.16.

Buffalo. (From our Special Correspondent.)

Feb. 16.

(From our Special Correspondent.) The weather has moderated at last, but yet there are many coal-burning days and nights in store without a doubt, so that the happy times for the coal merchant will not be over for a long period. Quotations of anthracite unchanged and the figures for bituminous a shade easier. Supply of coal ample for all requirements. The greater portion of the Grand Trunk railway of Canada's hituminous coal contract has been awarded, but as usual the price is kept quite secret. It is understood 'bat Messrs. H. K. Wick & Co., of Buffalo, get 150,000 tons, and Mr. Evan Morris, of Cleveland, 50,000 tons; the Willis

Creek Coal Company, of Detroit, and Messrs. O. W. Shipman & Co., of Detroit, were successful bidders for the Western section supply. Perhaps by next week more definite information can be obtained. The ice on Lake Erie is very thick and extends may miles from shore. At Monroe, fishermen re-port hat they have been out thirty miles and the was observable as far as the eye could see. The toward gondola coal and coke cars have here ordered by the Pennsylvania Railroad to be delivered by May 1st. This company is reported to even yoak & Pennsylvania Railroad has always were regarded as the road which will be absorbed in the pennsylvania people deny that the Beech Credk ere. The towards the toward which will be absorbed on the pennsylvania people deny that the Beech Credk ere. The tast news is that there is some mism fer-tion for a new through route to Chicago. The tasts news is that there is some mism ther-tween the London & Port Stanley Railway and the vast 100,000 tons; then it was aunounced that was 100,000 tons; then it was aunounced that the secured 400,000 tons; then it was aunounced the the contart. The Yes far the secure doug on the start of the contract is the secure doug on the start of the secure to the start was 100,000 tons a year for four years. New Press was 100,000 tons a sear for four years. New Press was 100,000 tons a sear for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,000 tons a year for four years. New Press was 100,00

Chicago. Feb. 16.

Chirago. Feb. 16. (From our Special Correspondent.) For the first time in many years there has not fol-lowed, through the moderation of the weather, a weakening in the circular prices of anthracite coal, and for the 8 or 10 weeks of average zero tempera-ture which has been experienced in this section of the country, all classes of dealers have had a good and fair profitable business. This has depleted the stocks in all the Western markets to such a point that even with moderate weather from now to May 1st or opening of navigation, the trade which must naturally come to dealers will take care of all the coal in stock at Chicago and other Western dis-tributing points. Hence it is believed that the predic-tion of 60 days ago in these columns of the shipments of large amounts of all rail coal to supply the de-mands of the country trade tributary to Chicago will be fully realized. Even the smaller dealers, who have thought that the actions of the "combine" were inimical to their interests are compelled to ad-mit that never in twenty years has the market for anthracite heen in as good shape for their protec-tion as it is to-day. There is scarcely the same de-mand for coal as there was a week ago, but it is suf-ficient to absorb all the rail coal coming forward. Some individual shippers still complain of shortage of chestnut and egg; stove is more plentiful. Re-tai trade is fair, but the rush is evidently a thing of the past.

of chestnut and egg; stove is more plentiful. Re-tail trade is fair, but the rush is evideutly a thing of the past. Bituminous coal, during the past 24 hours, has shown a marked improvement in supply, and the stringency is about over. More Indiana block and Indiana bituminous coals have been brought in by the railroads than during any other cqual period of time for the past six or eight weeks. The streets present their natural appearance with their hun-dreds of teams loaded with steam coal going in all directions to their various customers. There is as yet no over supply of any grade of soft coal, but the railroads have raised or relieved their blockade and brought in all their side-tracked coal. The various nines are working more freely with a larger output than for some weeks past, the supply of cars is reported generally as good, and everything points to a contunous, prosperous and satisfactory business in these coals. Indiana block coal is selling to-day t& 2750c83 per ton on cars here with a good demand for all that is offered. Somman and Blossburg smithing coals have been very scarce, and prices have been better. There is a general feeling among the larger shippers that they have been very shortsighted in their policy of entering so many cheap contracts early in the season, and this has been accentuated by the feeling of chagrin at some of their neighbors who had no cheap contracts being able to sell coal during the late extreme scarcity at very profitable prices. In fact, everything that by any stretch of the imagination could be called soft coal was sold and delivered at high prices. It is the gen-erel ophion that from now on bituminous coal, like the anthracite market, will take care ot itself and make morey for its producers. Hocking coal is now in fair supply, though the reports from Toledo as to the safety of the bridge across the Maumee River on account of the ice going on, is anything but consola-tory to shippers via the Lake Sbore road, that line being the largest earrier of this coal to the

being the largest earner of this coal to the Chicago market. Coke is in better supply and demand steadily in creasing as foundries are gradually resuming their normal condition of activity. There is, though, some complaint of slow shipments of Connellsville, but it has improved since beginning of week. Quotations are: \$4.65 furnace; \$5.05 foundry, crushed; \$5.40 Connellsville; West Virginia: \$3.00, furnace, \$4.10 foundry; New River foundry, \$4.75; Walston: \$4.65 furnace, \$5 foundry. Circular prices are at the following rates : Lehigh lump, \$6.50; large egg, \$55; small egg, range and chestnut, \$6.10. Retail prices per ton are : Large egg, \$7.25; small egg, range and chestnut, \$7.25. Prices of bituminous per ton of 2,000 lbs., f. o. b. Chicago, are : Pittsburg, \$3.40; Hocking Valley, \$3 10; Youghiogheny, \$3.25; Illinois block, \$2; Brazil block, \$2.60@\$2.75.

Pittsburg.

(From our Special Correspondent.)

Feb. 16.

(From our Special Correspondent.) **Coal.**—The situation presents little that is new. Statements are very conflicting. Preparations are still heing made o mine Kanwaha coal by at least two Pittsburg firms. Of course unless the coal men and miners come to an understanding, and that specdily. other firms will he found to go and do like-wise. The situation at Cincinnati is that nearly all the Pittsburg owned elevators and coal yards are now using more or less Kanawha coal. A number of Pittsburg-owned coal barges have been sent up the Big Kanawha River to be loaded with coal for the Cincinnati market. In addition to cheaper mining there are no mining tolls to pay, and then the dis-tance is much less than from Pittsburg. It is said that railroad coal can be had at Cincinnati at \$2 per ton. The strikers can then have no intention

that railroad eoal can be had at Cincinnati at \$2 per ton. The strikers say they have no intention whatever of showing violence to the men and will confine their efforts to intercepting new men and arguing with them. The operators on the other hand claim that many of the old miners who thoroughly under-stand the situation have gone to work and that nearly 500 of them are now in the mines along the river. The miners answer this by saying if this number of men are at work there ought to be some coal ready to ship on the present stage of water. The men at Brownsville are all said to be out.

some coal ready to ship on the present stage of water. The men at Brownsville are all said to be out. At California and Coal Center a few are at work, while those at the Eclipse, Caledonia, Champion, American, Snowhill, Briggs, Jones, O'Neil's and Clipper mines are unanimous for the price, and claim to have means sufficient to live out the strike to a successful issue. Connellsville Coke. The demand for coke is good and all the works in operation have been making good time. The average during the past month with its unseasonable weather has been over five and a half days. The operators, however, have been colliged to stock some coke to do this. This stock is being rushed off gradually. In the neighborhood of 10,000 tons of it was unloaded last week and if the car supply improves the yards will soon be clean. The railroads are showing a disposi-tion to take hetter care of the coke trade. The t tal output for January was 29,632 cars, consigned as follows: To Pittsburg and river points, 9,278 cars; points west of Pittsburg, 13,672 cars; points aggregated 7,640 cars consigned as follows: To Pittsburg and river tipples, 1,910 cars; points week is 112 cars. Week's shipments aggregated 7,640 cars consigned as follows: To Pittsburg and river tipples, 1,910 cars; points week of Pittsburg, 3,388 cars; to points east of Con-nellsville, 1,717 cars; increase compared with pre-vious week is 112 cars. Prices unchanged.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, Feb. 17. Heavy Chemicals.—There is nothing new to re-port of this market. Business continues quiet and without special feature. There is a better demand for caustic soda and prices are firm. Alkali, although not in so good a demand, is not pressing for sale. Of 48% ast there is a scarcity. Prices show little or no change from last week. We quote: Caustic soda. 60% 2.95% 310c; 70%, 270% 280c; 74%, 2724% 282%c;; 76%, 250% 290c. Carbonated soda ash. 48%, 140% 160c; 55%, 135% 140c Alkali, 48%, 135% 140c; 58%, 120% 130c., according to package. Sal soda, English, on the spot. +05% 110c; American, 90% 95c.; bleaching powder, 23714@ 2624c. Acids.— Manufacturers continue husy filling

the spot. 195/@190c.; American, 90(@95c.; bleaching powder, 2:371/g@2621/gc. Acids. — Manufacturers continue husv filling orders contracted for at the beginning of the year. The demand thus far has been good, and prices have been firmer, although no advance has taken place. We quote: Acid, per 100 lbs, in New York and vieinity, in lots of 50 carboys or more: Acetic, \$1.75@\$2.25, according to quality; muriatic, 18', 90c.@\$1.10; 20', \$1(@\$1.25', 22', \$1.25%\$1.50', nitric, \$6.50. Blue vitriol is quoted all the way from \$3.25' to \$3.75; glycerine for mitro-glycerine, 111/g@12/g ccording to quality and quantity. Brimstone—The market for Sicilian brimstone is stronger. Cable advices received to-day announce advancing prices. We quote this week: On the spot, best unmixed second, \$22; best thirds, \$21; March-April and April-May shipments, \$20 for best unmixed recond and \$19.25 for best unmixed thirds.

unnixed recond and \$19.25 for best unnixed thirds. Fertilizing Chemicals.—The fertilizer market during the past week has experienced some activity. There has been a strong demand from the South, and also from Northern points, and a good many sales are reported.Owing to their continued scarcity the ammoniates, if anything, are higher in prices than last week. We quote : Sulphate of ammonia, on the spot \$3.05(\$3.10. for bone goods and \$3.10@ \$3.12½ for gas liquor; September shipments, gas liquor, \$3.07½(@\$3.10. Dried blood, \$3@\$3.05 per unit for high grade and \$2.95@\$3 for low grade; acidulated fish scrap, no stocks on hand; dried scrap, nominally \$26 f. o. b. fish fac-tory. Azotine, \$2.85@\$2 00. Tankage, high grade, \$30@\$32; low grade, \$29@\$31. Bone tankage, \$23.50@\$32; hone meal, \$23@\$25. **Phosphate Rock.**—There is nothing of interest

Phosphate Rock.—There is nothing of interest to report of the phosphate market this week. Quo-tations are unchanged : \$4.75 for 55% rock, free alongside at Charleston.

FEB. 18, 1893.

The in Net Acid Com Carl Chro

The price of double manure salts as fixed by the syndicate is as follows: New York and Boston, \$1.12; Philadelphia, \$1.14¼; Charleston and Savannah, \$1.17 ewt. basis, 48@50% in 50 ton lots on foreign weights and analyses. Sulphate of potash, 90%-96%, basis, 90%; New York and Boston, \$2.07; Philadel-phia, \$2.09½; Charleston and Savannah, \$2.12; sulphate of potash, 96-99%, basis 90% is 4% higher. Muriate of Potash.—There is a fair demand for this article. During the week, arrivals amounted to 50 tons; sales ex-store, 250 tons. Prices for 1893 are as follows: New York or Boston \$1.73; Philadel-phia, \$1.80½; Southern ports, \$1.83. Kainit.—Arrivals this week amounted to 600 tons, Quotations are as follows: New York, Philadelphia and Boston, \$8.75 for foreign invoice weight and test, and \$9 for actual weight; Charles-ton, Savannah and Willmington, \$9.50 for invoice weight and test, and \$9.75 for actual weight. Nitrate of Soda.—The nitrate market is much casier this week owing to the arrival of two eargoes, which has relieved the stringency of supplies pre-valing at the time of our last report. We quote this week : On the spot, \$2.25; December sailing, \$2.15; January, \$2.05; May forward to September, \$1.72½ (a\$1.75.

Liverpool. Feb. 8. (Special Correspondence of Joseph P. Brunner & Co.) Heavy ehemicals are in fair request, but no active business to report. The principal feature is still position. Soda Ash.—There are a fair number of inquirles, and business has been done on "private quotations. The nominal values may be quoted as follows: Caustie ash, 48%, £5@£5 5s. per ton; 57-ton; 58%, £57s. 6d.@£5 15s. per ton. Ammonia ash, 5%, £5 2s. 6d.@£5 15s. per ton. Ammonia ash, 5%, £5 2s. 6d.@£5 5s. per ton. Ammonia ash, 5%, £5 2s. 6d.@£5 5s. per ton. Ammonia ash, 5%, £5 2s. 6d.@£5 7s. 6d. per ton—all net eash. For ton; 58%, £5 2s. 6d.@£5 15s. per ton. Ammonia ash, 5%, £5 2s. 6d.@£5 7s. 6d. per ton—all net eash. For ton ake concessions. Soda Crystal are dull at £3 2s. 6d. to £3 3s. 9d. per ton, but quotations are very irregular, depending entirely upon quantity and export market. Values appendix of the ton; 76%, £12 to £12 5s. per ton extra is charged. A reduction will be made for contracts ver the year.

Bleaching Powder although not active is very firm at £8 to £8 5s. per ton, net eash, for hardwood naekages.

Chlorate of Potash continues in a strong position, and a lurther large business has been done. For February delivery 9d, per lb, has been freely paid and the market is now practically cleared for this month, although perhaps an odd lot might be picked up in second hands at 9d. to 9½d, per lb, For March 8½d, to 9d. is quoted, and 8½d, for April and May. For July and December 7½d, to 7¾d, are nearest quotations.

Bicarb. Soda is steady at $\pounds 0$ 15s. per ton, less $2\frac{1}{2}$ % for one ewt. kegs, with usual allowanee for larger packages.

Sulphate of Ammonia is searce, but not quite so strong, the nearest values being about £10 15s. to £10 16s. 3d. per ton for good grey, 24%, and £10 17s. 6d. to £11 per ton for 25%, both in double bags, less 2½%, f. o. b. here. Nitrate of Soda is a shade dearer at £9 17s. 6d. to £10 per ton, less 2½%, in double bags f. o. b. here. Cath Ammonia - Lump 21/d near the more 21/d

Carb. Ammonia.-Lump, 21/8d. per lb.; powder, 31/8d

			1
CURRENT PRICES.	Cbloride and sodium, # oz \$6.00	Double or strong, 54° B10@.14	Deuver.
These quetations are for wholesale lots	15 gr.,c.♥.,♥ doz. \$2.88 Oxide, ♥ oz\$27.25	Vermition-Imp. English, # h. 85@.90	February 11th, 1893:
in New York unless otherwise specified.	Gypsnm-Calcined, & bbl \$1.25@\$1.50	Am. quicksilver, bulk	Anaconda Higb. L
Commercial, in bhis, and cbys015@.017	Iodine-Resublimed\$3.30@\$3 35	Chinese	Bangkok-Cora Belle .0252
Chromic, cbem. pure, # 151.00.25	Iron-Nitrate, 40°, 2 b	American	Claudia J
for hatteries	47°, V b	Zinc White-Am., Dry, # b 04%@ 00 Antwern, Red Seal, # b	Diamond B
Hydrocyanio, U. S. P	Kieserite-# ton	Paris, Red Seal, # b	Justice
Alcohol-95%, # gall\$2.30@\$2.40	White, American, in oll, # h06%@.07%	Sulphate crystals, in bbls # 1b033	Tam O'Shanter
A bsolute	White, Englisb, @ b., in oil	THE RARER METALS.	Work
Alum-Lump, # cwt \$1.75@\$1.80	Granulated	Aiuminum—# lb	Total sales
Powdered, # b	Lime Acetate-Am. Brown90@.95	Barlum-(Metallie), per gram \$4.00	Helena, Mont.
Aluminum Chloride-Pure, # 15.81.25	Gray.\$1.75@\$1.87 % Litharge-Powdered. % b06%@.0716	Cadmium-(Metallic), per lh \$1.00	(Special report hy F. M. I
Amalgamating solution, # b	English flake, # b	Calcium-(Metallic), per gram\$10.00 Cerium-(Metallic), per gram\$7.50	ending February 11th.
Ammonia-Sul.,in bbl.lots, # 1.0216@.03	kilos\$14.75	Chromium-(Metallic), per gram. \$1.00	Stock. Bald Butte (Mont.)
Carbonate, # D., Englisb and German.	Brick, # ton of 2,240 lbs	Didymium-(Mctallic), per gram. \$9.0	Benton Group (Neihart), Mont
Muriate, white, in bbls., # B0816	Manganese-Ore, per unit	Gailium-(Metallic), per gram\$7.50 Gailium-(Metallic), per gram\$140.00	Cumberland (Castle), Mont
20°, ¥ h	Mercuric Chloride-(Corrosive	Glucinum-(Metallic), per gram. \$12.00	Klizabeth (Phillipsb'g), Mont Florence (Neihart)
Antimony-Oxymur, # b	Powdered. # 15	Iridium-(Fused), per oz\$12.0	Helena & Victor, Mont
Argois-Red. nowdered. # lb	Marbie Dust—# bb1 \$1.25 Metailic Paint—Brown # ton. \$20(#\$25	Lithium-(Metallic), per gram\$10.00	Poorman (Cœur d'Alene), Idab
Arsenic-White, powdered # b.03@.0314	Red	Magnesium - (Powdcred), per lb. \$4.00 Manganese-(Metallie), per lb \$1.10	whitlach Union & Macintyre
Yellow	Ordinary rock	Chem. pure, per oz. \$10.00	Pittsburg, Pa.
White at Plymouth, # ton£1226 Asbestos—Canadian, # ton\$50@\$300	Mica-In shects according to size.	Niobium-(Metallic), ger gram \$5.0	COMPANY.
Italian, # ton, c. l. f. L'pool£18@£60	1st quality, # b	Palladium-(Metallic), per oz	Chartlers Val. Gas 10
Pearl	Nitre Cake-# ton	Platinum-(Plate), per oz \$11.00 Potassinm-(Metallic) per lb \$28.0	Enterprise Mining Co
Asphartum- Prime Cuban, # 15	Washed Nat Oxf'rd, Lump, \$5.06% @.06%	Rhodium-(Metallic), per gram. \$5.0	uster Mining Co 10
Hard Cuban, \$ ton\$28.00@\$30.00 Trinidad, refined, \$ ton\$30.00@\$35.00	Washed Nat Oxf'rd, Powder, \$10.07@.073 Golden, \$10	Ruthenium-(Metallic), per gm. \$5.50 Rubidium-(Metallic), per gram. \$2.0	N. Y. & Cley. G. D 50
Egyptian and Syrlan, # b05@.07 5	Domestic, \$ ton\$12@\$20	Selenium-(Metallic), per oz \$1.80 Sodium-(Metallic), per lb	Pennsylvania Gas 14 Pople's N. G. & P. Co 14
at San Francisco, # ton.\$15.00@\$29.00	Cylinder, light filtered, & gal14@.16	Stroutlum-(Metallie), per gm	Philadelphia Co 22
Barlum-Carbonate, pure, # b	Dark filtered, 9 gal 10@.13 Extra cold test 9 gal 90@.94	Telurium-(Metallic), per lb \$5.00	Wheeling Gas Co 20
Chloride commercial # 15	Dark steam refined, #gal.(9@.1?	Titanium-(Metallic), per gram	W DOUSE AIr Brake Co138
pure, # b	Precip., red, # b	Thorium-(Metallic), per gram\$17.00	Duluth.
Nitrate. # b	white, # 15	Uranium-(Oxide), per lb \$5.00	LISTED STOCK. Par.
Sulph., Am. prime white, # ton\$17.50@\$19 Sulph., foreign, floated, #ton,\$21@\$23	Plumoago-Ceylon, # b	Vanadium-(Metallic), per gm	Blwablk M. Iron Co100
Sulph., off color, # ton\$11.50@\$14.00	American, # b	Xttrium-(Metallic), per gram	Clark Iron Co100
No.1, Casks, Runcorn, " £4 10 0	67%, @ lb45		Great Northern Min. Co100
Bauxite-# ton	Bromlde, domestle, # 1b	STOCK MARKET QUOTATIONS.	Kanawha Iron Co 100
Bichromate of Potash-Scotch,	Chlorate, powdered, English, # 15	Aspen, Colo. Feb. 11.	Lake Superior Iron Co 25
American, # b	.14%@.15% Carbonate, #1b., by casks, 82%.04%@.05	Argentum Juniata S0 65 80 66	Little Mesaba Iron Co100
Borax-Refined, # b., in car lots.08(0.09	Caustle, # lb., pure slick	Aspen Contact 1.00 1.10	Mountain Iron Co100 Minneapolis Iron Co100
Concentrated, in car lots	Nitrate, refined, # lh	Best Friend	Mesaba Moun. 1ron Co 100
Bromine-% b 15@0.2	Yellow Prusslate, # b	Bi-Metallie	Security Land & Exp. Co. 10
Cadmium Minion-# lb \$2.00	Red Prussiate, # b	Delia S 1.90 2.00 Gold Valley Placer	UNLISTED STOCKS.
Chalk-# ton	Original cks., # b	Little Annie	Allegbeny Iron Co 10
China Clay-Englisb, # ton\$13@\$18.00	Powdered, pure, # b	Pontiac	Aurora Iron Co100
Domestic, ¥ ton	Quartz-Ground, # ton \$6.00@\$10.0 Hotten Stone, Powdered, # 15.0344(#.034	St. Joe & Mineral Farm11 .13	Buckeye Iron Co
Chrome Vellow-# b	Lump, # b	U. S. Paymaster20	Chicago Iron Co
Francisco	Rubbing stone, # 15	Colorado Springs, Colo. Feb. 11.	Champion Iron Co 100
Commercial, # lb	Salt-Liverpool, ground, # sack	Anaconda Gold	Columbia Iron Co100
Cobalt—Oxide, # b	Domestic, fine, # ton	Calumet	Detroit Iron Co 25 Davion Iron Co
Vitriol (blue), ordinary, # 15. 0314@.0.14	Turk's Island, # bush	Fanny Rawlins	Great Western Mining Co.100
Nitrate, # 10	Saltpeter-Crude, # b	Gold King	Homestead Iron Co 25
Best, # 100 lbs	Block and slab according to size.	Jack Pot	Kentucky fron Co100
Liverpool, # ton, in casks£2@£210F. Corundum—Powdered, # b0436@.09	Sodium—Prussiate, # b	Lemhi	Kakina Iron Co 25 Lackawanna Iron Co100
Flour, # lh	Stannate, # b	Manitou Park	McCaskill Mining Co
Emery-Grain, # b. (# kg.)	Hyposulpblte, # b., in casks, .0235@.024	Ophir 10½ .12	Mesaba Chief Iron Co100
Epsom Salt-# b 01@.01%	Sulphur-Roll, # b	Pearce-Jensen Reduct'n Co08 .11	Myrna Iron Co 10
Feldspar-Ground, # ton\$6.00@\$10.00 Crude\$2.00@\$3.00	Flour. # b	Pharmaeist	Northern Light Iron Co100 New York Iron Co
Fluorspar-Powdrd, No.1, \$ ton. \$20@\$30	Tale-Ground French, # b014@.014	Work	New England Iron Co 100
French Chalk-	American No. 2	Hico. Colo. Fab 11	Oneota Iron Co
Glauber's Salt-in bbls., ? b01@.0114	Terra Alba-French, #b	Atlantie Cable Cons. M Co	Pennsylvania I. & S. Co. 100 Rouchleau Iron Co100
Gold-Chloride, pure crystals 202, 212 00	American, No. 1, 9 B	Atlantic Cable guaranteed	Republic Iron Co 25 Red Hematite Iron Co 100
pure, 15 gr., c. v., & doz. \$5.40	Tin-Crystals, in kegs or bbls14@.10	Iron Dollar Silver Mines Co	Standard Ore Co 25
s. v., @ doz \$5.50	Muriate, single	Unele Ned Co	Zenlth Iron Co 25

per lb.

STOCK MARKET QUOTATIONS.

	DIG.	Aske
Anaconda Gold	.311/2	. 35
Calumet	.06	.07
Cleopatra	90	.20
Fanny Rawlins	.13	.16
Gold & Globe		.07
Gold King	.26	101
Isabella	.19	
Jack Pot.	.0134	1.9
Jeff Davis	.02	0.1
Lemhi	1.95	.03
Maniton Pack	A s da ()	10
Matoa	•••	10
Onbir	1014	19
Omban Doll	10%9	.13
Degree former Deduct's Co	.04	.00
Pearce-Jensen Reduct n Co	60	.17
Pharmaeist	.29	.33
Summit M. & M	.2 <	.30
Work	.9	.09
World	.03%	.04

Deuver.	
Prices and sales for the February 11th, 1893;	week ending
Higb.	Low. Sales.
Anaconda\$0.351/2	\$0.32 8,600
Bangkok-Cora Belle .0259	021/4 1,200
Claudia J034	.034 11,400
Clay Co	.011/2 5,600
Diamond B011/2	.011/2 3,000
Gold Rock0134	.011/4 1,100
Justice	.011/2 2,300
Puzzler	.08 6,000
Tam O'Shanter0114	.011/4 600
WORK	.081/2 7,200

Total sales..... 46,500 Helena, Mont.

Pittsburg, Pa. Feb. 15.

COMPANY.	B	A
B idgewater Gas Co,	27.00	10.00
Cartiers Val. Gas	10.00	11.00
Enterprise Mining Co		3.00
Hidalgo Mining Co	5.50	6.50
uster Mining Co	10.00	10.38
Manufacturers' Gas		- 30.000
N. Y. & Clev. G. D	50.00	51.50
Pennsylvania Gas		10.25
P ople's N. G. & P. Co 1	14.63	
Philadelphia Co	22.00	22.25
Tuna Oil		20.00
Wheeling Gas Co	20.50	21 75
W'bonse Air Brake Co	38.50	140.00

Duluth. Feb. 10.

UNLISTED STOCKS. .10 1.00 10.00 44.00 $1.00 \\ 1.75$ $2.50 \\ 2.00 \\ .70$.40 $\begin{array}{r} 4.00\\.10\\.20\\3.85\\.10\\.66\\.50\end{array}$.05 .10 3.75 .04 .25 2.50 .60 .10 28.50 4.75 1.00 .25 .20 .55 28 4.10 .10 1.00

3.00

THE ENGINEERING AND MINING JOURNAL.

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				NE	W	1	YO	R	ĸ	M	IN	ING		STOCK QU	10	TA	TI	10	NS								
		DIV	IDE	ND.	PAY	INC	M	INE	S.					NON	I-DI	IDE	END	PA)	IN	ar	MINI	ES.					
NAME AND LOCATION	Feb. 11.	Feb	13.	Feb.	. 14.	Feb	. 15.	Feb	0. 16.	Feb	. 17.	SALES.	11.	NAME AND LOCATION	Fel	b. 11.	Fe	b. 13.	Fel	b. 14.	Fet	0 15.	Feb.	16.	Feb.	17.	SALES
OF COMPANY.	H. L.	H.	L.	R.	L.	H.	L.	H.	L.	H.	L.			OF COMPANY.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams, Colo														Alta, Nev					·								
Amador, Cal				• • • • •									1	American Flag, Colo					1								
Beicher, Nev														Astoria, Cal					1								
Bodie Cons., Cal														" bonds					1								
Breece, Colo														Belmont, Cai					.21)	.20		.20		.20		62
Caledonia, S. Dak														Bonanza King, Cal			1.4	*					1.35			•••••	30
Catalpa, Colo Chrysolite, Colo	.22			.22								1,200		Bullion, Nev.	7	8	0		0:	1	. 10						2,90
Colorado Central, Colo Commonweaith, Nev														Castle Creek, Idaho.	:	:											• ••
Comstock T. bonds, Nev.					•••••									Comstock T., Nev	:		• ' · • • • •		.09		.10			•••••	60		10 4,10
Cons. Cal. & Va., Nev Crown Point, Nev	.75 .70									.65		400		Con. Imperial, Nev Con. Pacific, Cal													
Deadwood, Dak					• •••								11	Crescent, Colo Del Monte, Nev	:												
Eureka, Cons., Nev Father de Smet, Dak														El Cristo, Rep. of Col Emmett, Colo	54	5 .54	50		.50				.48	.40	59		3,80
Freeland, Colo	1.60	1 00					••••					4/0		Exchequer, Nev Independence, Nev	3	5 3	3										20
Grand Prize, Nev	1.40							1.25	1.20			200	1	Julla, Nev	. 1	3											20
Homestake, Dak												200		Kentuck, Nev		1											
Independence, Nev														Lee Basin, Colo										•			
Iron Silver, Coio														Middle Bar, Cal		1		1.00					1.40		1 80		00
Little Chief, Colo				. 19				.19				1,000		Monte Cristo, N. S. of (3.1	5 8.0	3 3 1	5 3.10	3.15	3.10	3,10	3 (0	3.10	3.05	3.10		6,70
Mono						•••••	•••••							N. Standard, Cai													
Mt. Diabio, Nev						•••••								Occidentai, Nev											•••••		••••
N. Belle Isle, Nev Ontario, Utah		15.00				16.00	15.50					130		Phoenix Lead, Colo													
Ophir, Nev		2.25		2.10			•••••	2.'0	2.00	2.00		500		Phoenix of Arlz Potosi, Nev.	: 2	5 2	$0 23 \\ 1.53$	5 .20 5 1 50	.2:	3 .20	22	20			.2)		6,70
Piymouth, Cal Quicksilver, Pref., Cal		.65										100		Rappahannock, Va S. Sebastian, S. Sal	• • • • • • •	• • • • • • •											
Duiney, Mich.				•••••		3 50						100		Santa Fe, N. M Scorpion, Nev	• •••												
Robinson Cons., Colo		1.00												Seg. Belcher, Nev Shoshone, Idaho													
Sierra Nevada, Nev										1.20		100		Silver Hill, Nev													1
Silver King, Ariz.														Sutro Tunnei, Nev										•••••			
Small Hopes, Colo				1.50										Tornado Con., Nev	. 0	5 0	4										
ollow Jacket, Nev				1.30								100		Utah, Nev	. 1 1	· · · ·		·[····		· ·····							10
*Ex-dividend. +D	ealt'at in	New	Yer	R SICI	ck ha	L L	nilste	0 500	uriti	es. \$	Asse	ssment p Totai sha	nid. res	Assessment unpaid. soid, 31, 50.	Divi	dend	shar	es sole	d, 4,6	3.). N	on-dl	vlder	nd sha	ares s	oid,	26,420	•

BOSTON MINING STOCK QUOTATIONS.

NAME OF COMPANY.	Feb. 10.	Feb.	11. j F	eb. 13.	Feb.	14.]	Feb.	15.	Feb.	16.	SALES.	NAME OF COMPANY.	Feb	10.	Feb	. 11.	Feb. 13	Feb. 14	Feb. 15.	Feb. 1	SALES.
Atiantic, Mich												Ailouez, Mich			1						
Bodle, Cal												Arnoid, Mich									
Bonanza Development		1.11									1	Aztec, Mich									
Bost. & Mont., Mont		33 15 .	34	.00	34.25 3	14.00.5	14.25 8	4.00	34.50		395	Brunswick, Cai									
Breece, Colo												Butte & Boston, Mont	11 25		11 00			111 (0	.11 00	1	380
calumet & Hecla, Mich	GUG	30 .	30	5	310 .				310		11	Centenniai, Mich	8.00					8.00	8 50 8 00	9 00 8	38 1.775
Catalpa, Colo												Colchis, N. Mex									
Central, Mich												Copper Fails, Mich									
Cœur d'Alene, 1d												Crescent, Colo									
Con. Cal. & va., Nev												Dana, Mich									
Dunkin, Colo												Don Eurlque, Mex									
Eureka, Nev												Geyser, Colo									
Franklin, Mien			13	3.00]	13 00 .				18.50	12.00	265	Hanover, Mich									
Honorine, Utan												Humboidt, Mich									
Horn Silver, Utah												Hungarian, Mich									
Kearsarge, Mich		12.00].				1	12.00 .		11.75		85	Huron, Mich									
Lake Superior, Iron												Mesnard, Mich									
Little Pittsburg, Colo												National, Mich								1	
Minnesota Iron, Minn												Native, Mich									
Napa, Cal					1							Orientai & M., Nev									
Ontario, Utah												Phoenix, Ariz									
Osceola, Mich		37.00 .	36	5 50	37 00 .		36,50 3	6.25	37 50	37.00	375	Pontlac, Mlch									
Quincy, Mich		138 .			138 .		137 .		138	137	52	Rappahannock, Va									
Ridge, Mich												Santa Fe, N. Mex									
sierra Nevada, Nev												Shoshone, Idaho									
Sliver King, Ariz												South Side, Mich									••••
Stormont, Utah												Tamarack, Jr. Mlch			19 00						6
Tamarack, Mich		161 .	10	61					162		105	Washington, Mich.									
Te 'umseh, Mich												Wolverine, Mich.			1		2 13	9 95		0.50 9	95 1
				1	1				1		1		l		1					4.00 4	1, 000
	Dividend shares sold 1.03* Non dividend shares sold 2.195 Extended and an analysis of the second data																				
	Dividend shares soid, 1,325. Non-dividend shares soid 3,195, Total shares soi												801a,	4,520.							

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Name and Logation of Caritat	Shares.	Assessments.	Dividends.			Shares.	Assessments.
Company. Stock.	No. Pa	ar lotal pate and levied. amount of las	Total Date & amount paid. of last.	Name and Location of Company.	Stock.	No. Par	Total Date and am't ievied. of iast.
1 Adams, 8. L. C (Colo \$1,500,000	100,000 810	10 *	\$637.500 Jan. (1892) .05	1 Alliance, s. gUtah.	\$100,000	100,000 \$1	\$120,000 Feb., 1891 .2
Z Alaska-Treauwell, S. Alska 5,000,000	200,000 2	40 ·····	1,450,000 Oct. 1892 .37%	2 Aliouez, C Mich.	2,000,000	80,000 25	737,000 Jan. 1890 .7
1 ima & Nei Wood & Idaho 900.00	90,000 1	10 *	975,000 Nov. 1891 .0634	3 Alpas Con., G. 8 Nev	3,000,000	30,000 100	209.000 Sept. 1892 .1
5 imador, e Cai. 1.250.00	250,000	5 *	60,000 Jan: 1889 .50	4 Alta, S Nev.	10,090,000	100,800 100	3,369,880 Jan. 1892 .1
6 american, 0 Colo., 3.000.00	300,000 1	10 *	995 000 Mar 1990 05	6 American Kiag a IColo	3,000,000	125 000 1	900-000 Tune 1997
7 American Belie,s.g.C Colo. 2.000.000	400,000	5 *	50.000 April 1891 1214	7 Amity 8	250,000	250,000 20	300,000 3 4116 1557
8 Americ'n& Nettle, G.S Colo.	300,000		175.400 Mar. 1892 .05	8 Anchor, S. L. G., Utah.	8.000.000	150,000 5	410.000 June 1890 .20
9 Atlantic, C Mich 1,000,000	40,000 2	25 289,000 April 1875 \$1.0	700.000 Feb. 1891 1.00	9 Angio-Montana, Lt., Mont.	600,000	120,000 125	
10 Argenta, 8 Nev 10,000,000	100,000 10	00 335,000 July. 1889 .1	46,000 Feb. 1880 .20	10 Appalachian, g N. C .	1,750,000	1,400,000 20	
11 Argyle, G Colo 1,000,00	1,000,000	1	· 20.000 Mar. 1892 .01	11 Arlzona, C Ariz	3,575,000	160,000 2	
12 ABpen Mg. & S., S. L., Colo., 2,000,00	200,000 1	10 • · · · · · · · · · · · · · · · · · ·	· 760,000 Sept. 1892 .10	12 Astoria, G Cal	200,000	100,000 5	
14 Badger 8 0nt 950 00	100,000 4	δ0 ····· ··· ···· ····	- 455,000 June 1892 1.00	13 Atlanta, g. s	3,250,000	650,000 25	
15 Bald Rutte Mont 950 00	250,000	1 *	· 37.500 Mar. 1990 .25	14 Barcelona, G	5,000.000	200,000 5	*
16 Bates Hunter, S. g., Colo., 1,000.00	1.000.000	1	· (2,500 Mar. 1892 .03	is Beimont a	100,000	500,000 100	
17 Belle Isle, 8, Nev. 10,000.00	100,000 10	00 220 00 Ang. 1892	0 900 000 Dec 1970 95	17 Belmont a	8,000,000	50,000 100	795 000 A meti 1996 10
18 Beicher, S. G Nev 10,400,00	104,000 10	00 3,16 000 May 1892 .	5 15.897.000 April 1876 1 00	18 Best & Beicher, s. g., Nev.	10,080,000	100,800 10	2 405 275 Ang 1892 25
19 Bellevue, Idaho, s. L. Idaho 1,250,00	125,000 1	10 1: 000 Dec. 1889 .	5 200.009 Jan., 1890 .19	19 Black Oak, g Cal	8,000,000	300,000 100	*
20 Best Friend Colo. 1,000,00	1.000,000	1	- 90,000 Feb., 1892 .01	20 Boston Con., G., Cal.,	10.000.000	100,000 1	170.000 Nov., 1883 .25
21 Bi-Metallic, s. G Mont. 5,000,00	200,000	25	2,140,000 Dec. 1892 .20	21 Browniow, G Colo	250,000	250,000 5	
22 Bodie Con., G. I Cal 10,000,00	100,000 1	0,000 June 1890 .	5 1,602,572 April 1885 .50	22 Brunswick, G Cai	2,000,000	400,000 2	
11 Roston & Mont. C. 8. Mont. 2,500,00	250,000	10 * ····· ··· ··	520,000 June 1886 .15	23 Buckeye, s. L Mont.	1,000,000	500,000 100	
25 Brookivn Lead, T. 8 Iltah 50000	123,000	10	- 2,075,000 NOV. 1891 1.00	24 Bullion, 8. G Nev.	10,000,000	100,000 100	2,890,000 Aug. 1892 .25
26 Bulwer, G Cal. 10,000,00	100,000	10 190 000 Ang 1990	124,000 July 1884 05	25 Burlington, g. S Cal	10,000,000	100,000	
27 Bunker Hill & S.s.L. Idaho 8000.00	300,006	10 *	150 000 Oct. 1092 .00	20 Butte & Boston, 0. 8. Mont.	5,000,000	100,000 10	
28 Caledonia, G Dak 10.000.00	100.000 1	100 505.000 May . 1885	192 000 Oct. 1890 08	28 Calavaras o Cal	500,000	500.000 5	0,000 3 811 1552 .09
29 Calliope, s Colo 1,000,00	1.000.000 .		140.000 Jan. 1891 0014	29 Calaveras Con g Cai	800.000	160,000 10	
30 Calumet & Hecia o Mich. 2,500,00	100,000	25 1.200,000	-1 38,850,000 Dec. 1892 5 00	30 California, g	1.000.000	100,000 5	9.000 Mar. 1892 .03
31 Centen'l-Eureka, 8.J., Utah. 1,500,00	30,000	50	- 577,500 Dec. 1892 .50	Si California Con. I. Q., Cai.	2,250,000	450,000 10	
32 Central, C Mich. 500,00	20,000	25 100,000 Oct. 1861 .	65 1.970.900 Feb., 1891 1.00	32 Camille, g Ga	1.500,000	150,000 5	
33 Champion, G Colo	34,000	10	·· 114,900 Dec 1892 .10	33 Carisa, G Wy	500,000	100,000 2	*
34 Clev County Q Colo 900 0	200,000	30	·· 1,650,000 Dec. 1884 .25	34 Carupano, G. s. L. C Ven	200,000	100,000 2	
36 Clinton Con. g Cal	100,000	5	·· 56,000 Nov. 1891 .02	35 Cashier, 6.8 Colo	500,000	250,000 100	*
Si Coeur D'Alene, S. L. Idaho 5.00.0	500.000	10	** 50,000 Nov 1591 .10	27 Chanchas G. S. Nev.	3,000,000	30,000 10	
3s Colorado Central, S.L. Colo 2,750.0	275:000	10 .	502 500 Tan 1892 05	S Choller s a	11 200,000	112 000 2	1 9902000 Mar 1909 50
39 Commonwealth, s. Nev., 10.000.00	0 100,000	100 190.000 Sept. 1892	10 20.000 (Nov., 1890 20	39 Cleveland T Dak	1 000,000	500,000 10	1,020,000 aray 1002
40 Confidence, s. L. Nev 2,496,00	24,960	100 1,589.550 Aug., 1892	50 199,680 April 1889 1 00	40 Coichis, s. o. N. M.	500,000	150,000 5	
41 Cons. Cai. & Va., 8.0 Nev 21,600,00	8 216,000	100 108,000 Jan. 1885	20 3.682.800 Ang. 1891 .50	41. Colorado, s	1.625.000	325.000 1	
42 Contention, s Ariz 12,500.00	250,000	50	2,637.500 Ang. 1892 .20	42 Comstock, sUtah.	1.250,000	250,000 100	
43 COOK'S Peak, S N. M. 2,000,00	200,000	10	114,532 Nov. 1892 .05	43 Comstock Tun Nev	10,000,000	100,000 100	35,000 Mar. 1887 .15
4 Coptie Con., C. Ariz. 1.400,00	140.000	10	1,260,000 Nov. 1892 1.00	44 Con. Imperial, G. s . Nev	5,000,000	50,000 50	2,062,500 Jan. 1892 .25
AS COPTER & New 18000	100,000	100	67,000 July. 1892 .12	45 Con. New York, s. G. Nev.	5,000,000	100,000 100	110,000 Mar. 1892 .10
47 Crescent, 8, L, 9, Utah, 15 00 00	600,000	25 60.000 Oct. 1909	10 929 000 Oat 1992 .50	40 Con. Pacific, G Cal	6,000,000	60,000 10	198,000 June 1890 10
48 Crown Point, G. s Nev 10.000.00	100,000	100 2.700.000 Sept. 1892	25 11 999 000 Ten 1975 0.00	48 Cordove Union g (Cal	2,300,000	200.000 0	
49 Cumberland, L. S Mont. 5.000.00	500,000	10 •	15.000 Nov. 1889 09	49 Crespent S. L. Colo.	8,000,000	800,000 100	*
50 Daly, S. L Utah. 3,000,00	150,000	20	2.650.000 Jan., 1893 25	50 Crocger, 8.	10.000.000	100,000 1	165.000 Aug. 18921 05
51 Deer Creek, s. G Idaho 1,000,00	200,000	5 *	20,000 June 1989 05	51 Crowell, g. N. C.	500,000	500,000 1	
52 Deadwood-Terra, G., Dak 5,003,00	200,000	25 *	1,150,000 Oct 1892 .05	52 Dahlonega, G	250,000	250,000 10	*
51 OeLamar, s. G Idaho 2,000,00	490,000	5	550,000 Oct 1892 .25	58 Dandy, s Colo.	. 5,000,000	500,000	
10,000.00	1 100,000	100 100,000 Sept, 1892(10 60,, 330 Aug. 1391 10	54 Decatur, s	1,500,000	300,000	I

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-			DIVID	EN	D-PAYING	MINES						NON-DIVI	DEND-PA	YING M	IIN	ES.			
	Name and Location of	Capital Stock.	Shares		Assessme Total Da	ents. ate and	Total	Dividen	ds. & a	mount		Name and Lecation of	f Capital	Shares	•	Total	Date	ents. and	am
nyk.	Dexter, g. 8	1,000,000	No.	Par 10	Levled. amo	unt of last	pald. 80,00	0 Aug.	1592	.25	55	Denver City, 8 /Col	D 5,000,000	No. 500,00	Par 11	levled	Of	last	2
56 87 58	Dunkin, S. L Colo Elkhorn, S. L Mont. Enterprise, S Colo	5,000,000 1,000,000 100,000	200.00 200 00 10,000	20 5 10			885.54 700,00	5 Dec.	1889 1892 1892	50 .10	56 57 5	Denver Gold, G Col Dickens-Custer, s Ida Durango, G Col	b 300,000 bo 2,100,000 b 500,000	420,000 500,000	5 5 1	••••••			•••••
50	Eureka Con., S. L., G. Nev Evening Star, S. L Colo	1,000,000 500,000 10.000.000	50,000 50,000 100,000	100 10 100	200,000 June 200,000 Nov.	1889 .50	5,017,50 1,450,00 1,125,00	U Jan U Lec. U Dec	1892 1889 1885	.25 .2 .20	59 60 61	Eastern Dev. Co., Lt N. S El Dorado, G Cal El Talento, G. U.S	1,500,090 1,000,000	150,000 250,000 500,000	10 4	990,000 *	Mar.	1886	1.00
62	Franklin, o Mich Freeland, 8. G Colo	1,000,000 5,000,000	40,000 200,000 100,000	25 25	220,000 June	1871	1,100,00 190,00 90,00	0 July 0 July.	1892 1886 1888	2.00 .10 .1246	62 63	Emma, s	h. 625,000	500,000 2,000,000 100,000	125	••••			
66	Glengarry Mont. Gold Rock Colo.	1,000,000	100,000	10			10,00	0 June Dec.	1891 1891	.19 .01	65 66	Eureka Tunnel, s. L. Nev Exchequer, s. G Nev	10,000,000	100,000	100 100	940,000	Jan	1892	.25
67 68 69	Golden Reward S.Dak Gould & Curry, S. G. Nev Grand Prize S. Nev	1,250,000	108,000	100 100	4,591,200 June 785,000 Jan.	e 1892 .24 1890 .30	3,826,80	0 Oct 0 Mar.	1892 1870 1884	10.00 .25	67 68 69	Gogeble I. Syn., 1 Wis Gold Bank, g. s Cold	10,000,000 5,600,000 250,000	200,000 250,000	100 25 1	180,500	Jan.	1992	.50
70717	Granite, s. L	500,000 10,000,000 5,000,000	500,000 400,000 50,000	1 25 100		• • • • • • • • • •	83,40 12,120,00 394,86	0 Nov 0 July.	1890 1892 1892	.02 .20 .25	70 71 72	Gold Cup, s	t. 500,000 1,000,000	500,000 200,000 100,000	10	5.000	Mar		04
79	Green Mountain, G Cal Hale & Norcross, G.S. Nev	1,250,000 11,200,000	125,000 112,000	10 100	5,534,800 Ang	. 1892 .50		U NOV U Aug.	1881 1888 1999	.0732	78	Gold King. g Cold Gold Rock, g Cal	1,650,000	350,000 500,000 190,000	52				
75	Hecla Con., s. G. L. C. Mont. Hel'a Mg.& Red.s.L.G. Mont. Helena & Frisco. s.L. Idaho	3,315,000 2,500,000	663,000 500,000	55	*	· · · · · · · · · · · · · · · · · · ·	197.97	0 July. 0 July.	1886 891	.06	76 77	Goodshaw, G Cal. Goodyear G. S. L Mon	10,000,000 1,000,000	100,000 200,000	100 5	13,000	Feh	. 1892	.01
78	Helena & Victor Mont. ***Holmes, S Nev Homestake, G Dak	1,000,000	100,000	100 100	370,000 May 200,000 July	1890 .24 1878 1.00	75,00	0 April 0 Jan	1891 1886 1893	.05 .25 25	78 79 80	Grand Belt, C Fex Grand Canyon, s Ariz Grand Duke, s Colo	. 12,000.000 375,000 800,000	75,000	100 5	•••••			
81	Honorine, s. L Utah. Hope, s. Mont.	500,000 1,000,000 10,000,000	250,000 100,000 400,000	10 25	37,500 Apri	1 1889 .03	125.00 338,25 4,650,00	2 Jan .	1887 1893 1892	.05 .25 .12%	81 82 83	Gregory Con., G Mor Harlem M. & M. Co., G. Cal. Tartery Con., G. Cal.	t. 3,000,000 1,000,000	200,000 200,000 100,000	10	22.000	 Oct	189	
34 85	Hubert, G	1,000,000 310,000	1,000,000 3,100 100,000	100	• • • • • • • • • • • • • • • • • • • •		247.00 5,419,25 45.00	0 Dec. 0 Dec.	1889 1892 1889	.00% 2.50	84 85 86	Hartshorn,g s. l. S.D. Head Cent. & Tr., s. g Arli	1,250,000	250,000 100,000 300,000	5 100	8,750 16,981	Sept. Mar	1891 1892	.00
87 89	Iron Hill; s Dak Iron Mountain, s Mont.	2,500,000 5,000,000	250,000 500,000	10 10	134,000 July	1889 .05	156,25	0 Nov 0 Aug.	1887 1892	.07%	87 88	Highland, c Mic Himalaya, g. s 1 Uta	1. 500,000 h. 1,800,000	25.000 180,000	20 10	12,800	Oct	1892	.00
89 90 91	Jack Rahhlt, G Colo Lack Rahhlt, G Cal	10,000,000	100,000	100 100	100,000 Sept 237,500 Nov.	1892 .10 1880 .20	2,500,00	0 April 0 Aug . 0 Jan.	1889 1891 1891	.10	89 90 91	HolywoodCole Hortense, sCole Huron, C		200,000	2 10 25	280,000	May.	1887	3.00
92 93	Kearsarge, C Mlch Kennedy	1,000,000 10,000,000 3,000,000	40,000 100,000 30,000	25 100 100	190.000 Oct.	1887 1.00	80,00 387,00 1,350,00	0 Jan. 0 May	1890 1892 1886	2.00 .15 .10	92 93 94	Idaho, g. s Idal Inez, s. L Idal Ingalls g	1,250,000 10 1,000,000 100,000	250,000 1,000,000 20,000	51		•		
95 96	Le Plata, S. L Colo Leadville Con., S. L Colo	2,000,000	200,000 400,000 40,000	10 10	:		610,00 304,00	0 Sept. May	1882 1892 1890	.30 .03	95 96 97	Ironton, I	1,000,00	40,000	25 25		inin l		
97 98 99	Little Chief, s. L Colo Little Rule, s Colo	10,000,000 500,000	200,000	50 1	•		820,00 220,00	0 Dec	1890 1891	.05	98	J. D. Reymert, s Ariz Julis Con., G. s Nev	10,000,000 10,000,000 11,000,000	100,000	100 100	1,463,000	Jan.	1892	.10
00	Mald of Erin Colo Mammoth, S. L. O Utah. Martin White S. Nay	3,000,000 10,000,000 10,000,000	400,000 400,000 100,000	5 250 100	110,000 1,275,000 Jan.	. 1882 .25 1892 .25	557,75 1,040,00 140,00	0 Dec 0 Dec	1892 1891 1886	.25 .10 .25	$101 \\ 102$	Lacrosse, G	500,000 1,000,00 150,000	500,000 100,000 3,000	1 10 50				
18	Mary Murphy, S. G Colo Matchless, S. L Colo	350,000 500,000 3,000,000	3,500 500,000 300,000	101 1 10	•		175,00 15.00 117.00	0 May 0 Feh 0 April	1888 1890 1892	5.00 .00%	$103 \\ 104 \\ 105$	Lee Basin, s Cold Little Josephine, s Cold Lone Star Cons. G. Cal.	5,000,000 250,000	500.000 50,000 500.000	16.	*	Anril	1909	
106 107	Mayflower, D. gravel Cal May Mazeppa, S. L Colo.	1,000,060	100,000	10			100,00	0 Dec 0 Oct	1892 1891	.25	106 107	Lynx Creek, g. Ariz Madeleine, G. S. L Cold	237,500	147,500 50,000	5	4,500	Feb.	1892	.003
108 109 110	Minas Prietas, G. S Mex Minnesota, C Mich Mollie Gibson, S Colo	1,000,000	40,000	25 5	420,000 Apri	1 1886 1.00	1,820.00	0 Mar. 0 Jan	1876 1893	15	109 110	Mayflower Gravel, G. Cal. Medora, G	1,000,000 250,000	100,000 250,000	10	585,00	Mar.	189	.56
111	Monitor, G S.Dak Mono, G	2,500,000 5,000,000 8,300,000	250,000 50,000 660,000	10 100 5	760,000 Sept.	1890 .2	45,00 12,50 2,619,07	0 Oct 0 Mar 5 June.	1890 1886 1891	.03 .25 125	112 112 113	Merrimac Con., G. s. Colo Mexican, G. s Nev. Michigan, g s Mict	5,000,000 10,000,000 2,500,000	500,000 - 100,000 100,000	10 10(25	2,917,560	ct	1892	.50
14	Morning Star, S. L Colo Morning Star Drift, GCal	1,000,000 240,000 2,000,000	100,000 2,400 400,000	10 100	*		925,00 111,80 410.00	0 April Dec	1891 1892 1892	.25 8.00	114 115 116	Middle Bar, G Cal. Mike & Starr, s. c Colo Milwaukee		200,001 200,004 500,001	24.	:			
10 17 18	Mt. Diablo, s Nev Napa, Q	5,000,000 700,000	50,000 100,000	100	137,500 June	1880 2.00	210.00	July. Jan.	1891 1893	20 .20	117 118	Mlnah Cons	t. 1,250,000 0 1,000,000	250,000 200,000	5	5,000	lan.	1892	.003
119 120 121	Navajo, G. S Nev Newton	10,000,000	100,000	100	•	1891 20	10,00	May.	1891 1890	.05	120 121	Montreal, c. s. L Uta Mountain Ledge, g Cal.	1. 750,000 500,000	150.000 100,000	1 5 5	4,500	nay. Feh	1891 1892	.003
22 23	New Guston, s Cole North Banner Con Cal North Commonw'th New	550,000 1,000,000 10,000,000	110,000 100,000 100,000	3 10 10			1,877.50 20,00 25,00	July.	1892 1891 1891	.75 .05 .25	123 124	Mount McClellan Cold Mutual Mg. & Sm W's Native, c	- 1,500,000 1. 100,000 1. 1,000,000	300,000 100,000 40,000	5 1 25	•			•••••
25	N. Hoover Hill, G. s. N. C . North Belle Isle, s Nev.	300,000 10,000,000 1,000,000	120,000 100,000 100,000	21/6 100	474,689 Nov.	1892 .10	30,00 230,00 350,00	May.	1885 1888 1892	.06½ .50	125 126 127	Neath, G Colo Nelson Cal. Nevada Queen a	1,000,000 50,000	100,000	10		Dat		
28 29	Omaha Cons., G Cal Ontarlo, s. L	2,400,000	24,000 150,000	100	4 910 640 4		30,000	May Oct	1892 1892	.15	128 129 130	New Germany, g N. S New Gold Hill	100,000	100,000 350,000	1 5				.40
90 31 92	Ophir, G. s Nev Original, s. C Mont. Oro. s. L. G Colo.	1,500,000	60,000 100,000	25 5	4,210,640 A pri		138,00	Jan July,	1889 1890	.05	131	New Queen Gold, s., Cold North Standard, g., Cal.	2,000,000 \$00,000 10,000,000	160,000 100,000	10 5 100	20,000	Nov		
38 34 98	Osceola, c Mich Pacific Coast, B Cal Parrot. c	1,250,000 1,500,000 1,800,000	50,000 13,000 180,000	25 100 10	480,000 April	1 1876 1.60	1,697,50 360,00 1,405,38	Dec. Dec.	1892 1892 1892	1.00	184	Oriental & Miller, s. Nev	10,000,000 500,000 10,000,000	100,000 125,000 400,000	100 100 100	245,000	April	1892	.25
36 37	Petro Utah. Plumas Eureka, G Cal Plymouth Con. a. Cal	10,000,000 1,406,250 5,000,000	10,000 140,625 100,000	100 10 50	*		17,50 2,643,55 2,280,00	9 July. 9 April 0 Feb.	1891 1892 1888	.75	136 137 138	Original Keystone, s. Nev Osceola, g	10,000,000 5,000,000 11,520,000	100,000 500,000 115,200	100-10-100	250,000	Mar.	1892	.10
30 39 40	Poorman, G. S Idaho guicksliver, pref., g. Cal	375,000 4,300,000 5,200,000	300,000 43,000 57,000	125 100	*		68,26 1,825,91 643 86	Sept June	1892 1891 1882	1.25	139 140 141	Park, s. Utal Parker, g Utal N. C	1, 2,000,001 750,000	200,000 180,000 200,000	10				
41 42 43	Quincy, c Mich Red Cloud Idaho	1,250,000 1.000,000	50,000	25	200,000 Dec.	1862	6.470.00 153,00	0 Feh. Dec.	1893 1892	3.00	142 143	Peer, s. Ariz Peerless, s. Ariz	10,000,000	100,000	а 100 100	190,000 405,000	Feb.	1892 1890	.10
44 45 46	Reed National, S. G., Colo., Retriever, L	1,250,000 300,000	250,000 200,000	5 1	•	·····	20,00	Aug.	1891 1892	.03	145	Phoenix, g Ariz Phoenix Lead, s. L		500,000 100,000	10	*	ren	1892	.10
47 48	Richmond, s. L Nev Ridge, C Mich	1,350,000 500,000 10,000,000	54,000 20,000 200.000	25 25 50	219,939 Mar .	1886 50	4,346,32 99,78 585.00	5 Aug 5 Feb 0 Mar .	1891 1880 1886	.25	144 148 149	Pilgrim, G Cal. Ploche M.&R.,s.G.L. Utal Poorman, Ltd., S T Idat	. 600,000 20,000,000 0 250,000	\$00,000 2,000,000 50,000	210	•			
50 51	Running Lode, G Colo Savage, S	1,000,000 11,200,000 300,000	1,000,000 112,000 3,000	$100 \\ 100$	6,772,000 Feh.	1892 .50	36,00 4,460,00 300,00	0 May. 0 June	1892 1869 1891	.00 1-10 3.00 2.50	151 152	Potosi, s	11,200,000 0 250,000	112,000 250,000 150,000	106	1,573,00	Mar.	1891	.50
53 54	Shoshone, g Idaho Slerra Buttes, G Cal	150,000 2,225,000	150,000 122,500	1 10	- 411 010 Tame	1000 00	7,50	0 April	1883 1892 1871	.01	153 154 155	Quincy, c	8,000,000 k 1,250,000	\$00,000 250,000	10	4.250	uly.	1892	.004
55 56 57	Slerra Nevada, s. G., Nev Slerra Nevada, s. L., idaho Silent Friend Colo	1,000,000	1,000,000 500,000	1	•		40,00	May.	1889 1891	.02	156 j 157 j	Red Elephant, s Colo Red Mountain, s Colo	500,000 	500,000 60,000	1	•			
58 59 60	Silver Cord, s. L. G Colo Silver King, s Ariz Silver Mg.of L.V.s.L. N. M.	4,500,000 10,000,000 500,009	450,000 100,000 500,000	100 100	130,000 Nov.	1890 .90	1,950,00 300,00	0 July 0 Dec	1887 1891	.10 .25 4.05	159 160	Ruby & Dun., s. L. G. Nev. Russell, G	. 2,000,000 . 25,300 . 1,500,000	506 300,000	25 50 5	167,200 1	eb. 1	189!	.50
61	Stide Colo Small Hopes Con., s. Colo Spring Valley G. Cal	500,000 5,000,000 200,000	5,000 250,000 200,000	100 20 1	\$0.000 Oct.		20,00 \$2,00,00 . 50,00	0 Nov 0 Nov 0 Jan	1891 1892 1884	4.00	161 162 163	Sampson, G. S. L Utal Seal of Nevada, g.s Nev. Silver Age, s 1. g. Colo	10,000,000 5,000,000 2,000,000	100,000	100 50	288,15	uly.	1885	1.06
53 64 65	standard, g. s Cal Stormout, s Utah.	10,000,000 500,000	100,000	100	100,000 June	s9 .50	3,645,000 155,000	Dec	1892 1881 1890	.10	164 165 166	Silver Bell, s Arlz Silver King, s Cai.	850,000 2,000.000	170,000 400,000	5				
66 67 78	Swansea, g. s Colo Yamarack, o Mich	600,000 1,250,000	60,000 50,000	10 25	520,000 A 111	35 8.00	27,000	Mar.	1892 1892	.10	167 168 169	Silverton, s	300,000	200,000 60,000 200,000	20 5 10	13,000	lay. 1	892	.013
69 70	Teal & Poe N. M Fombstone, G. s. L Ariz United Vorde, C Ariz	12,500,000 3,000,000	150,000 500,000 800,000	25 10	*	· · · · · · · · · · · ·	1,250,000 207,500	April Jan	1891 1882 1892	.011 <u>6</u> .10 .10	170 S	South Bulwer, G Cal South Hite, g Cal South Pacific, g Cal	19,000,000	100,000 100,000 100.000	100	100,000 1 195,000 1	day. 1 an 1	880	.05
72 73	Viola Lt., s. L idaho Ward Con., s Colo.	750,000 2,000,000 100,000	150,000 200,000 100.000	5 10 10			337,500 20,000 25,000	Dec.	1888 1889 1889	.37%	173 S 174 S	stanislaus, g Cal. st. Kevin, s. g Colo.	2,000,000	200,000	10	: .			
74 75 76	W. Y. O. D Cal Cal	90,0,00 1,900,000	15,000 260,000	5	22,500 May.	1891 .10	42,000	Dec. April	1892 1891 1871	.10	175 S 176 S 177 S	t. Louis & St. Elmo. Colc. t. L. & St. Felipe, G.S. Mex.	. 000,000	200,000 150,000	10 .				
14	Yosemite No. 2 Utah.	1,000,000	100,000	10	sept.		25,000	Oct	1891	.05	178 S 179 S 180 S	ten.winder, l. s Idah unday Lake, I Mich.	500,000 1,250,000	500,000 500,000 50,000	10 1 .				
•••											81 S 82 T	ylvanite, s Dak. aylor-Plumas, e Cal.	600,000 5,000,000 \$25,000	200,000 500,000 65,000	3 10 5	8.575	iar .	892	.012
•											84 T 85 T	elegraph, g. s Cal. elegraph, g. s Mex. eresa, g. s Cal	325,000 100,000	65,000 100,000 200,000	515	3,575 b 70,000 F	lar. 1 eb. 1	892 592 885	.015
							•••••		••••		87 I 88 T	loga Con., G Nev ornado Con., G. S Nev	10,007,00	100,000	10	295.000	lay 1	889	25
	· · · · · · · · · · · · · · · · · · ·						••••••••••••			1	89 90 U 91 U	nion Con., G. s Nev tah, s	10,000,000	100,000 1 100,000 1	00	370,000 J 245,001 A	une li ug. li	892 891	3.4.5
	· · · · · · · · · · · · · · · · · · ·									1	92 93 94 W	alley, g	575.000 590,000	460,000 1 500,000	25	1,50	ar. 11		
						••••				1	95 W	est Granite Mt., s., Mont.	1,000,000 750,000 500,000	40,000 150,000 100,000	5.5				
						••••				19	8 W 9 W	hale, s Mont. ood River, g Idaho	5,000,000 2,000,000	500,000 200,000 400,000	10 10 2	* 3,000 A	ug. 18	891	.0035
:)							n Ze	laya, G. S	0,000,000 .					1.	•••••

G., Gold. S., Sliver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. † Non-assessable for three years. § The Deadwood previously paid \$27,000 in eleven dividends and the Terra \$75,000. Previous to the consolidation in August, 1884, the California had vaid \$31,320,000 in dividends, and the Cons. Virginia \$42, 30,000, ** Previous to the consolidation of the Copper Queen with the Atlanta. August, 1884, the Copper Queen bad \$31,320,000 in dividends. This company paid \$190,000 before the reorganization in 1880. ** This company sequired the property of the Raymond & Fly (Company which had paid \$3,075,000 in dividends. *** Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends against \$425,000 in dividends.

THE ENGINEERING AND MINING JOURNAL.

FEB. 18, 1893.

NEW YORK	MINING	STOCK QUOTATIONS.
DIVIDEND-PAYING MINES		NON-DIVIDEND-PAYING MINES.
NAME AND LOCATION Feb. 11. Feb. 13. Feb. 14. Feb. 15. Feb.	. Feb. 17. SATES	NAME AND LOCATION Feb. 12. Feb. 13. Feb. 14. Feb. 15. Feb. 16. Feb. 17.
OF COMPANY. H. L. H. L. H. L. H. L. H.	H. L.	OF COMPANY. H. L.
Adams, Colo		Alpha., Nev
Allce, Mont		Anta, Nev
Atiantic, Mich		Andes, Cal.
Belcher, Nev	** ***** ***** *****	Astoria, Cai.
Bodie Cons., Cal		" bonds
Bos. & Mont., Mont		Barcelona, Nev.
Breeco, Colo		Bernold, Cal. Nev. 1,50 1,10
Caledonia, S. Dak		Bonanza King, Cal
Catalpa, Colo	1.900	Brunswick, Cal
Colorado Central, Colo.	1,200	Butte & Bost., Mont
Commonwealth, Nev		Castle Creek, Idaho.
Comstock T. bonds, Nev.		Constock T. Nev
Cons, Cal. & Va., Nev		Con. Imperial, Nev
Crown Polnt, Nev	65 400	Con. Pacific Cal
Peterprise		Del Monte Nev.
Eureka, Cons., Nev		El Cristo, Rep. of Col 55 50 50 50 48 40 50 3,800
Father de Smet, Dak		Emmett, Colo
Gonld & Curry, Nev 1.00 1 00	4/0	Independence, Nev
Grand Prize, Nev		Juila, Nev
Hale & Norcross, Nev 1.40 1.25	.20 200	Zustice, Nev
Horn-Silver, Utah	210	Lacrosse, Colo
Independence, Nev		Lee Basin Colo
Iron Silver Colo		Mexical, Nev 1 9) 1 90 1.85
Leadville Cons., Colo19191919	1,000	Monitor, Colo
Little Chief, Colo		Monte Cristo, N. S. of C. 3.15 3.03 3 15 3.10 3.15 3.10 3.10 3.00 3.10 3.05 3.10 6,700
Martin white, Nev	••• ••••• •••••	Nevada Queen, Nev
Mt. Diabio, Nev		N. Commonwealth, Nev.
Navajo, Nev		Occidental, Nev.
Ontario, Utah	130	Phoenix Lead. Colo.
Ophir, Nev 2.25 2.10 2.'0	00 2.00 500	Phoenix of Ariz 23 20 25 20 23 20 22 20
Overman, Nev		POTOSI, Nev
Onicksliver. Pref., Cai.		S. Sebastian S. Sai
" Com., Cal		Santa Fe, N. M
Pulney, Mich	100	Scorplin, Nev
Savage, Nev		Shoshone, Idaho
Sierra Nevada, Nev	1.20 100	Silver Hill, Nev
Silver Cord, Colo		Sullivan Con., Dak
Silver Min. of L. Valley.		Syndicate, Cal.
Small Hopes, Colo.		Tornado Con., Nev 05 04 50
Standard Coas., Cal	100	LIDION CODE NOT
		Ultah. Nev

BOSTON MININC STOCK QUOTATIONS.

NAME OF COMPANY.	Fel	b. 10.	Feb	- 11.	Feb	. 13.	Feb	. 14.	Fel	. 15.	Fe	b. 16.	SALES.	NAME OF COMPANY. Feb. 10. Feb. 11. Feb. 13 Feb. 14 Feb. 15. ;	Feb. 16. [8]	ALES
Atlantic, Mich		·						í						llouez. Mlch		
Bodle, Cai									1					rnold, Mich.		
Bonanza Development														ztec. Mich.		
Bost, & Mont., Mont			33 75		\$4.00		34.25	34.00	\$4.2	34.00	34.5		. 395	runswick, Cal.		
sreece, Colo														utte & Boston, Mont11 25 11 00		. 90
aiumet & Hecla, Mich	3.6		30		305		310				310		77	entennial, Mich	90 8 00 6	1 1
Cataina, Colo,											1			olchis N. Mex	00 0 00	4,11
entral. Mich										1				onner Falls, Mich		• •
Cour d'Aiene, 1d										1				rescent Colo		
on, Cal. & Va., Nev												• • • • • • •	• • • • • • • • • • • • • • • • • • • •	ana Mich		
unkin, Colo								*****						on Envious Mor		
ureka, Nev.												• • • • • •		Laver Colo		
ranklin, Mich.					12.00		18 00				19 5	100	0 965	anover Mich		
Ionorine, Iltah					1110100		10 00				10.0	1 24.6	50.0	umboldt Mich		
Jorn Silver, Utah.														ungestion Wich		
Zoorsarge Mich			19.00						100 0		11 2			ungarian, michanness		
ske Superior Iron			14.00				*****		12.0	1	111.6		• 00	uron, mich.		
ittle Pitteburg Colo						1			****					estional Mich		
Minnesota Iron Minn														actorial, mich		
Sana Cal														ative, mich		
Antonio Eltab				1										rientai & m., Nev		
Mich Mich	•••••		100 00		00 00							:		noenix, Ariz		
Dulpor Mich			01.00		30 30		54 00		36.5	36.2	36 3	0.36.0	0 375	ontiae, mich		
Pidge Mich			135				138		137		138	137	52	appanannock, Va		
Marge, Mitch														anta Fe, N. Mex.		
Sterra Nevaua, Nev			*****											heshone, Idaho		
sliver King, Ariz	****													outh Side, Mich		
stormout, utan														amarack, Jr, Mich 19 (0		1
Amarack, Mich.			161		161						162	1	. 105	Vashington, Mich.		
e umsen, mich								1						Volverine, Mich 2.13	2 50 2 25	1.
		1	1	1		1		1		1	1	1				1 00

Dividend shares sold, 1,325. Non-dividend snares sold 3,195,

4

DIVIDEND-PAYING MINES.

Total shares sold, 4,520. NON-DIVIDEND-PAYING MINES.

Addie and Location of	/21/1021							1	1 1	Name and Location of	Canital					
Company. S	stock.	NO. F	ar	lotal Date and	Total	Date	& am	ount		Company.	SLOCK.		Dee	Total	Date and	1'man't
		1400	-	ievied. amount of last	pald.		of las	st.				NO.	Par	levied.	of la	st.
1 Adams, 8, L. C (Coto., 8	LOOKLONK!	INCASES!	810	•	0 697 B()	Tan	1909	05	1	Ailiance s a .IItab	\$100.000	STAR COMPT	81	de 1903 (KW)	Fab (190)	1: 2
2 Alaska-Treadwell, g. Al'ska	5,000,000	200.000	25		1.450.00	0.Oct	1899	9716	2	Ailonez C. Mich	2,000,000	80,000	25	787 000	Jan 189	0 7
3 suce, s Mont. 1	000,000	400.000	25		975 00	Nov	1891	0644	3	Alpha Con. G. B. Nev.	3,000,000	30,000	100	209.000	Sent 189:	2 .1
4 1ima & Nel Wood., @ Idaho	300,000	30.000	10	•	60,00	1 Jan:	1889	50	4	Aita 8	10,090,000	100,800	100	3 369,880	Jan 189	2 .1
5 imador, G Cal.	1,250,000	250,000	5	•	81.25	0 Ang.	1890	1246	5	American, C Idaho	5,000,000	500.000	100	0,000,000		
6 American, G Colo	3,000,000	300,000	10	*	225.00	0 Mar.	1892	.05	6	American Flag. s Coio	1.250.000	125,000	1	300:000	June 188"	2
7 American Belle, s.G.C Colo.	2,000,000	400,000	5	*	50,00	0 April	1891	.1236	1 7	Amity, s Colo	250,000	250,00C	20			
8 Americ'n& Nettle, G.S Colo		300,000	·	····	175,00	0 Mar.	1892	.05	8	Anchor, s. L. G Utah.	3.000.000	150,000	5	410,000	June 189	0 .20
9 Atlantic, C Mich.	1,000,000	40,000	20	280,000 April 1875 \$1.00	700,00	0 Feb	1891	1.00	9	Anglo-Montana, Lt., Mont.	600,000	120.000	125			
IU Argenta, S Nev. 1	10,000,000	100,000	100	335,000 July. 1889 .10	40,00	0 Feb	1880	.20	10	Appalachian, g N. C .	1,750,000	1,400,000	20			
11 Argyle, G	1,000,000	1,000,000	10		20.00	0 Mar.	1892	.01	11	Arlzona, C Arlz	3,575,000	160,000	2			
12 Augore I Mich	2,000,000	200,000	10		760,00	lo Sept.	1892	.10	12	Astoria, G Cai	200,000	100,000	5			
14 Bedger 9	2,300,000	100,000	40		455,00	June	189.2	1.00	13	Atlanta, g. s	3,250,000	650,000	25			
15 Baid Butte Mont	250,000	250,000	1	****	34.50	W Mar.	1890	.25	14	Barcelona, G	5.000.000	200,000	0			
16 Bates Hunter, S. g., Colo.	1 000 000	1 000 000	1		12,00	Dar.	1892	.03	10	Belmont a	100,000	20,000	100			
17 Belle Isle, s Nev. 1	10.000.000	100.000	100	220 00 Ang. 1892 .16		Dec.	1891	.0094	10	Belmont a	500,000	50,000	100	798 000	A malt 100	10
18 Belcher, 8. G Nev	10,400,000	104.000	100	8.16 (00 May 1892 .2	15 907 0	00 April	1976	1 00	19	Bost & Balabar & a Nov	3,000,000	100,000	10	9 405 975	AUG 100	01.0
19 Bellevue, Idaho, S. L. Idaho	1,250,000	125,000	10	1: 000 Dec., 1889 .2	200 0	10 Ian	1890	10	19	Riack Oak a	9 000 000	300,000	100	4,400,610	Mug., 109.	~ . G.
3 Best Friend Colo.	1.000.000	1.000,000	1		90.0	0 Feb.	1899	01	26	Boston Con a Cal	1,000,000	100,000	100	120.000	Nov 198	95
21 Bi-Metallic, s. G Mont.	5,000,000	200,000	25		2 140 0	DO Dec.	1892	201	21	Browniow a Colo	250,000	250.000	5	110,000	1000.1000	
22 Bodle Con., G. I Cal 1	10,000,000	100,000	100	0,000 June 1890 .2	1,602.5	72 April	1885	50	22	Brunswick, g	2.000.000	400,000	2			
23 Soston & Mont., G Mont.	2,500,000	250,000	10		520.0	00 June	1886	.15	29	Buckeye, s. t Mont.	1.000.000	500,000	100			
24 Soston & Mont., C. S. Mont.	3,125,000	125,000	25	*	2.075.0	OG NOV.	1891	1.00	24	Bullion, s. G Nev.	10.000.000	100,000	100	2,890,000	Aug. 189	2 .25
25 Brooklyn Lead, L. S Utah.	500,000	50,000	10		127,0	00 July.	1887	05	25	Burlington, g. s Cal	10,000,000	100,000				
26 Bulwer, G Cal	10,000,000	100,000	10	130,000 Aug. 1889 .2	5 190,0	00 Oct	1892	,05	26	Butte & Boston, c. s., Mont.	5,000,000	200,000	10			
Colodonia d Dat	3,000,000	300,006	10		150,0	00 Oct.	1888	.06%	2	Butte Queen, G Cai	1,000,000	100,000	1	6,000	Jan. 189	2 .04
20 Callione 8 Colo	1,000,000	1 000,000	100	505,000 May . 1885 .1	192,0	OC Oct.	1890	,08	22	Calaveras, G Cal	500,000	500,000	5			
A Calumet & Hecla o Mich	1,000,000	1,000,000	***	1 900 000	140,0	00 Jan.	. 1891	,00%	2	Calaveras Con., g Cal	800,000	160,000	10			
31 Centen'I-Eureka, 8.L. IItah.	1,500,000	90,000	51	1.200.000	38,850,0	ou Dec.	1892	5 00	1 30	California, e	1,000.000	100.000	5	9,000	Mar . 1893	.03
32 Central C. Mich.	500,000	20,000	90	100.000 Oot 1961	577.0	Dec.	1892	.50	3	California Con. I. Q. Cal.	2,250,000	450,000	10			
33 Champion, G C	500,000	34,000	10	100,000 000. 1001 .0	1.940.8	Dec.	1891	1.00	3	Camine, g Ga	1,500,000	100,000	5			
34 Chrysolite, s. L, Colo.,	10.000.000	200.000	50	•	1 650 0	00 Dec	1884	.10	10	Carinano a a y a Von	300,000	100,000	3			
35 Clay County, G Colo.,	200,000	200,000	1 1	i •	56 0	NOV.	1901		9	Cashier a s	500,000	950,000	100			
36 Clinton Con, g Cal	5,000,000	100,000	1	5	80.0	Nov.	1891	10	3	6 Challenge Con g s Nev	5.000.000	50,000	10			
37 Coeur D'Alene, S. L. Idaho	5,000,000	500,000	10	0	310.0	NOV.	1891	.02	3	7 Cherokee, g. Cai.	1,500,000	150,000	100			
3. Colorado Central, S.L. Colo	2,750,000	275,000	10	0 *	. 502.5	00 Jan.	1892	05	3	8 Choilar, s. g Nev .	11,200,000	112,000	2	1 8202000	May. 189	2 50
39 Commonwealth, s. Nev.	10,000,000	100,000	10	0 190.000 Sept. 1892 .1	0 20.0	MO (NOV.	. 1890	.20	3	9 Cleveland. T Dak.	1.000.000	500,000	10	*,000,000		
40 Confidence, S. L. Nev	2,496,000	24,960	10	0 1,589.550 Aug. 1892 .	0 199,6	580 Apr	1 1889	1.00	4	0 Colchis, s. G N. M.	500,000	150,000	5			
41 Cons. Cal. & va., 8.6 Nev	21,600,000	216,000	10	0 108,000 Jan. 1885 .	0 3,682,8	300 Ang	. 1891	.50	4	1 Colorado, s Coio.	1,625,000	325,000	1			
42 Contention, 8 Ariz	12,500,000	250,000	5		- 2,637.	500 Ang	. 1892	.20	1 4	2 Comstock, s Utah	1,250,000	250,000	100			
48 COOK'S FCak, S N. M.	2,000,000	200,000	1		- i14,	532 Nov	. 1892	.05	4	S Comstock Tun Nev.	10,000,000	100,000	100	85,000	Mar . 188	37 .15
4 Coptie	1.900.0001	140.000	1 10		- 1,260,	000 Nov	. 1892	1.00	4	4 Con. 1 mperial, G. s . Nev.	5,000,000	50,000	50	2,062,500	Jan., 189	12 ,25
46 Cortes 9 Nov	10,000,000	100,000	10	No	. 67,	000 July	1892	.12	1 4	5 Con. New York, s. G. Nev.	5,000,000	100,000	100	110,000	Mar. 189	12, .10
A Crescent S L G IItah	15 000 000	200,000	9	CO 000 Oct 1000	687,	000 Mar	1892	.50	4	Con. Pacific, G Cal .	• 6,000,000	60,000	10	198,000	June 189	10 10
48 Crown Point, G. S Nev.	10,000,000	100,000	1 10	0 9 700 000 Sept 1992	238,	oool Jort.	1888	.03	1 4	Con. Silver, 8	- 2,500,000	250.000	5			
49 Cumberland, L. S Mont.	5,000,000	500,000	1	11 2,100,000 Sept. 1052	11,898	000 Man	1042	2.00	1 9	S Cordova Union, g Cal	. 1,000,000	200,000	10			
50 Daly, S. L Utah	3,000,000	150,000	9	20	9 650	000 100	180	.03	1 2	Crosser & L	3,000,000	100,000	100	100 000	A	
51 Deer Creek, S. G Idanol	1,000,000	200.000	1 1	5 *	2,030,	000 700	A 1890	.20	1 2	Crowell a	10,000,000	500,000		165,000	Aug. 189	60. 12
52 Deadwood-Terra, G., Dak.	5,000,000	200,000	2	25 •	1 1.150	000 Oct	180	.00	1 5	2 Deblonege a	250,000	250,000	10			
53 DeLamar, s. G Idaho	2,000,000	400,000		5	550	000 Oct	189	2 25	1 5	B Dandy, 8	5,000,000	500,000	10	-		
54 Derbec B. Grav., G Cal 1	10,000.000	100,000	10	0 100,000 Sept, 1892	10 60	.))0 Auc	189	11 :10		Decatur, s	1.500.000	300.00)			
					1			1	1)		******	1				

Dividends.

peation of Capital Shares.

FRB. 18, 1893.

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			DIVID	EN	D-PAYING	MINES						NON-DIVI	DEND-PA	VING N	11N	ES.		-	
	Name and Location of	Capital	Shares		Assessm Total 1 D	ents. ate and	Total	Date	ds. & amot	Int	1	Name and Lecation of	Capital	Share		Total	Dete	nts.	am
_	Company.	Law that	No.	Par	Levied. amo	unt of last	pald.	Ane	of last.	5		Company.		No.	Par	levled	of	last	cell.
56	Dunkin, s. L	5,000,000	200.00 200 00	25	:		390,000 885,548	Dec.	1889 0 1892 5	5 5	56	Denver Gold, G Cold Dickens-Custer, S Idah	- 300,000 2,100,000	60,000 420,000	5				•
58 199	Enterprise, S Colo Eureka Con., S. L G. Nev	100,000	10,000 50,000	100	550,000 Jun	1889 .50	5,017,50	Jan	1892 .10 1892 .2	5 5	5 1	Colo Eastern Dev. Co., Lt N. S	500,000	500,000	1	990,000	Mar .	1886	.00
50 61	Evening Star, s. L Colo Father de Smet, G Dak	10,000,000	100,000	100	200,000 Nov 220,000 Jun	1878 1.00	1.125,000	Dec.	1885 .2 1892 2.0			I Talento, G U.S.	C. 1,000,000 625,000	500,000	4 2 195		•••••		· • • • •
69	Freeland, S. G Colo	5,000,000 590,000	200,000 100,000	25 5	*		190,000 90,000	July.	1886 .1 1888 .1	6	13 14	mmons, s. L Colo Empire, s Utal	2,000.000	2,000,000 100,000	1100	• • • • • • • • • • • • • • • • • • • •			****
85 66	Glengarry Mont. Gold Rock Colo	1,000,000 500,000	100,000	10	••••		10,000	June Dec.	1891 .10 1891 .0	6	55 I	Lureka Tunnel, s. L. Nev.	10,000,000	100,000	100 100	940,000	Jan.	892	.25
67 68	Golden Reward S.Dak Gouid & Curry, s. G Nev	10,800,000	108,000	100	4,591,200 Jun 785,000 Jan	e 1892 .2	3,826,800	Oct.	1870 10.0			Jogeble I. Syn., I Wis	10,000,000 5,600,000 250,000	200,000	100 25	180,500	Jan.	1392	.:0
70	Granite, s. L Idaho Granite Mountain. s. Mont.	500,000 10,000,000	500,000 400,000	1 25			83,400 12,120,000	July.	1890 .00 1892 .2	77		old Cup, s Colo Iolden Era, s Mon	. 500,000 2,000,000	500,000 200.000	1	:			
72	Great Western, L. Q., Cal Green Mountain, G., Cal	5,000,000 1,250,000	50,000	100	# #94 900 A mg	1000 80	394,86	Dec.	1892 .2 1881 .0 1999 5	10 7	20	old Fist, G Cal. Jold King, g Colo	. 1,000,000 . 1,650,000	100,000	10 5	5,000	Mar.,	1892	.06
74	Hale & Norcross, G. S. Nev Hecla Con., S. G. L. C. Mont.	1,500,000	90,000	50	9,004,000 AIR	. 109.2 .04	1,920.000	Dec July.	1892 .5 1884 .0	7		Holden FeatherCu.g Cal.	. 1,000,000	180,000	2 5	•••••			
78	Helena & Frisco, s.L. Idaho Helena & Victor	2,500,000 1,000,000	500,000 200,000	55			170,000 80,000	July May	891 .0 1891 .0	7	17 (Foodyear G. s. L Mon Frand Beit, C Tex.	t. 1,000,000 12,000,000	200,000 120,000	5 100	13,000	Feb.	1892	.01
79	Homestake, G Dak.	10,000,000 12,500,000	100,000	100	870,000 May 200,000 July 27,500 Apr	. 1890 .2 . 1878 1.0	4,941.250	Jan.	1886 .2 1893 2 1997 0		79 (30 (Frand Canyon, s Ariz Frand Duke, s Colo	- 375,000 800,000	75,000 90,000	5 10				•••
81 82 89	Honorine, s. L Utah. Hope, s	1,000,000	100,000	10 25	*		318,252	Jan . Dec.	1893 .2 1892 .1	8	21	Harlem M. & M. Co., G. Cal.	1,000,000	200,000	10 5	22.000	Oct.	189	
34 85	Hubert, G Colo	1,000,000 310,000	1,000,000 3,100	100	*		247,000 5,419,250	Dec.	1889 .0 1892 2.5	1 8	4 H	Hartshorn, g s. l. S.Da lead Cent. & Tr., s. 6 Ariz	k 1,250,000 10,000,00	250,000 100,000	5 100	8,750 16,981	Sept. Mar.	1891 1892	.004
86 87	Illinols, 8 N. M Iron Hill, s Dak.	2,500,000	250,000	10	134,000 July	1889 .00	156,250	April Nov	1889 .2 1887 .0 1899 0	74 8	6 H	lighland, c Mich	. 1,500,000 . 500,000	25.000 180.000	5 20	.45,000	Jan.	1885	. 15
89	Iron Mountain, S Mont. Iron-Sliver, S. L Colo	10,000,000	500,000	20	100,000 Sept	. 1892 .10	2,500,000	April Aug	1889 .2 1891 .1	8	9 E	iolywood	200,000	100,000	10 2 10	16,000		1892	.009
91 92	Jackson, G. S Nev Kearsarge, C Mich.	5,000,000 1,000,000	50,000 40,000	100 25	237,500 Nov 190.000 Oct.	. 1880 .20 . 1887 1.00	60,000	Jan. Jan.	1891 .14 1890 2.0	9	11	daho, g. s Wieh	. 1,000,000 0 1,250,000	40,000 250,000	25	280,000	May.	1887	1.00
93 94	Kennedy Cal Kentuck, s. G Nev.	3,000,000	30,000	100	454,180 Oct.	1891 .1	1,350,000	Dec.	1892 .13 1886 .10 1882 .3	9	4 I	ngalis, g Idah Colo.	0 1,000,000 100,000	20,000	1 5			·	
96 97	Leadville Con., S. L Colo.	4,000,000	400,000 40,000	10	:		304,000	May Jan	1892 .00 1890 2.00	9	61	roquols, c Mich Kentuck Con Nev.	1,250,000	50.000 105,000	25	57,750	July.	892	.10
98 99	Little Chief, s. L Colo Little Rule, s Colo	10,000,000 500,000	200,000	50	•		820,000	Dec	1890 .03 1891 .05	90	8 J 9 J	. D. Reymert, s Ariz. ulla Con., G. s Nev.	10,000,000	100,000	100 196	1,463,000	Jan.	885	.10
100	Mald of Erin Colo Mammoth, s. L. C Utah.	10,000,000	400,000	250 100	110,000 1,275,000 Jan	. 1882 .24 1892 .94	1,040,000	Dec	1891 .10 1886 .2	101		acrosse, g Colo.	. 1,000,000 150,000	100,000 3,000	1	:			••••
138	Mary Murphy, 8. G Colo	350,000 500,000	8,500 500,000	101	*		175,000 15.000	May Feb	1888 5.00 1890 .00	100	9 1 4 L	ee Basin, s	5,000,001	500.000 50,000	16.	•			
105	Maxfield Utah. Mayflower, D. gravel Cal	3,000.000 1,000,000	300,000 100,000	10 10			117,000	April Dec.,	1892 .03 1892 .25	100	5 1 6 L	ynx Creek, g Ariz.	- 500,000 237,500	500.004 147,500	1	10,000	April	892	.005
107	May hazeppa, s. L Colo Minas Prietas, G. s Mex	1,000,000	100,000	10 25	420.000 Apri	1 1886 1.00	350,000	Dec	1890 .50 1876		8 M 9 M	lammoth Gold, G Ariz.	- 750,000 - 245,000 1,000,000	49,000	5	4,500	reb.	892	.00%
110	Mollie Gibson, S Colo Monitor, G	5,000,000 2,500,000	1,000,000 250,000	5 10			2,850,000 45,000	Jan Uet	1893 15 1890 .05	111		ledora, G Dak. lerrimac Con., G. s. Colo.	250,000	250,000 500,000	110	585,00	Mar.	89	.56
112	Mono, G Cal Montana, Lt., G. s Mont.	5,000,000	50,000 660,000 100,000	100	760,000 Sept	. 1890 .23	2,619,075	Mar June.	1886 .25 1891 12 1891 24	112 112 112		lichigan, g s Mich.	. 10,000,000 2,500,000	100,000	10í 25	2,917,560	et	892 892	.50
114 115	Morning Star, S. L Colo Morning Star Drift, GCal	240,000 2,000,000	2,400 400,000	100	*	• • • • • • • • • • • • • • • • • • • •	111,800 410,000	Dec Nov.	1892 3.00 1892 07	115	5 Y 6 M	like & Starr, s. c Colo.	. 1,000,000 500,000	200,00	44. 1				••••
117	Mt. Dlablo, s Nev Napa, q Cal	5,000,000 700,000	50,000	100	137,500 June	1880 2.00	210.000 520,000	July. Jan	1891 20 1893 .20	117		Inah Cons Mont Iodoc Chlef, 1 s. g. Idah	1,250,000 1,900,000	250,000 200,000	5	5,000	lan.	892	.003
119 120	Navajo, G. S Nev Newton	10,000,000	100,000	100	520,000 May	. 1891 20	10,000	April May	1889 .10 1891 .03 1890 12	120	9 A 0 A 1 A	Colo. Contreal, G. S. L Utah	- 100,000 - 750,000 500,000	100,000	15	4,500	May. 1 Feb. 1	891 892	.001
121 122 123	New Guston, s Colo North Banner Con Cal	550,000 1,000,000	110,000 100,000	5 10			1,877.500 20,000	April July	1892 .75 1891 .05	122 123	2 M 3 M	lount McClellan Colo. lutual Mg. & Sm W'sh	1,500,000	300,000 100,000	5.	*			
124	North Commonw'th Nev., N. Hoover Hill, G. S., N. C .	10,000,000	100,000	10 21/6	474 690 Nov	1000	25,000	June. Dec	1891 .25 1885 .06	124 125 126	4 N	ative, c	. 1,000,000 . 1,000,000	40,000-	25 10				
128	North Beile Isle, s Nev North Star, G Cal	1,000,000	100,000	10	414,059 1404		350,000	Dec.	1892 .50 1892 .15	127	78	evada Queen, s Nev.	10,000,000	100,000	100	200,000	Det. i	689	.25
129	Ontario, S. L Utah Ophir, G. S Nev.	15,000,000 10,000,000	150,000 100,000	100 100	4,210,640 Aprl	1 1890 .50	13,175,000 1,595,800	Oct Jan	1892 .50 1880 1.00	129	9 N	ew Gold Hill N. C ew Pittsburg, s. L. Colo.	1,750,000	350,000 200.000	5				
131 132	Original, s. c Mont. Oro, s. L. G Colo	1,500,000	100,000	20 5 25	480.000 April	1976 1 60	138,000 95,000 1.697.500	Jan July,	1889 .05 1890 .20 1892 1.00	132	2 N 8 O	ew Queen Gold, s Colo. orth Standard, G Cal	. <u>\$00,000</u> 10,000,000	100,000	5 · 100	20,000	VOV		
133	Pacific Coast, B Cal	1,500,000	15,000	100			360,000 1,405,385	Dec. Dec.	1892 1.00 1892 .10	134	4050	uelda Chlef, g Cal riental & Miller, s Nev.	500,000	125,000	100 100	*		092	, (6)
136	Petro Utah. Plumas Eureka, c Cal	10,000,000 1,406,250	10,000	100			17,500 2,643,559	July. Apri	1891 .75 1892 .18	136		riginal Keystone, s. Nev. sceola, g	• 10,000,000 • 5,000,000	100,000	100 10	250,000	Mar. 1	892	.10
138 139	Plymouth Con , G Cal Poorman, G. s Idaho	375,000 4,300,000	30,000	125 100	•		2,280,000 68,260 1,825,911	Sept	1892 1891 1.25	. 139		ark, s	- 11,520,000 - 2,000,000 750,000	200,000	100	4,001,840	May. 1	892	.10
140 141 142	Quickshiver, pren., q. Cal Quincy, c	5,700.000 1,250,000	57,000 50,000	100 25	200,000 Dec.	1862	643 867 6,470,000	July. Feb.	1882 .40 1893 3.00	141	P	ay Rock, s Colo. eer, s. Arlz.	1,000,000	200,000	5	190,000 1	Feb. 1	892	.10
43	Red Cloud	1.000,000 500,000 1.250,000	200,000 500,000 250,000	5	*		153,000 50,000 20,000	Dec.	1892 .10 1890 .01 1891 .03	144		eerless, s Ariz. ennsylva'a Cons., G Cal	10,000,000 5,150,000	100,000 515,000 500,000	100	405,000 0 36,050 1	Peb. 1	890 892	.15
45	Rlaito, G	300,000	300,000 54,000	1 25	*		50,250 4,346,3 %	April Aug.	1892 .01 1891 .25	146	6 P	hœnix Lead, s. L Colo. ligrim, g	100,000	100,000	12				•
48 59	Ridge, c Mich Robinsou Con., s. L Colo	500,000	20,000 200,000	25 50	219,939 Mar .	1886 50	99,785 585,000	Feb Mar.	1880 .50 1886 .05	148		Pioche M.&R., s. G.L. Utah oorman, Ltd., s. L. Idah	20,000,000	2,000,000 50,000	10 - 5 -				
150 151	Savage, 8	11,200,000	112,000	100	6,772,000 Feb.	1892 .50	4,460,000	June Oct.	1869 3.00 1891 2.50	151		roustite, s		250.000	100	1,5/3,00 1	nar 1		.50
58 54	Shoshone, G idaho Sierra Buttes, G Cal	150,000 2,225,000	150,000 122,500	10			7,500	April Oct.	1883 .01 1892 .18	153	R	ulncy, cColo. ainbow, gS.Dal	3,000,000	300,000 250,000	10 5	4.250 J	uly. 1	392	0036
55 56	Sierra Nevada, s. G., Nev Sierra Nevada, s. L., Idaho	1,000,000	1,000,000	1	6,411,910 June		40,000	May.	1889 .02 1891 .02	156	R	ed Elephant, s Colo.	200,000 500,000 300,000	500,000 60,000	1	• :			
57 58 59	Silver Cord, s. L. G Colo Silver King, s Ariz	4,500,000	450,000 100,000	10 100	130,000 Nov.	1890 .30	265,000 1,950,000	April	1889 .10 1887 .25	158	R	opes, g. s Mich. uby & Dun., s. L. g. Nev.	2,000,000	80,000 506	25	167,200 H	eb. is	91	50
60 61	Sliver Mg.of L.V., S.L. N. M Slide	500,009	500,000	100			300,000 20,000	Dec Nov	1891 4.05 1891 4.00 1892 15 15	161 162	R	ussell, G N. C. Impson, G. S. L Utah	1,500,000	300,C00 100,000	5	288,15. J	uly is	8 1.	06
62 53	Spring Valley, G Cal Standard, G. S	200,000	200,000	1100	50,000 Oct. 100,000 June	.396 .25 59 .50	. 50,000 3,645,000	Jan Dec	1881 .25 1892 .10	163	SISI	lver Age, s 1. g Colo. Iver Bell. s Ariz.	2,000,000	100,000 200,000 170,000	10	•			•••
65 66	Stormont, s	500,000	500,000 150,000	10	:	••• ••••	155,000	Nov.	1881 .05 1890 .02	165	SI SI	lver King, s Lal. Aris.	2,000.000 5,000,000	400,000 200,000	5.	•			
67 78	Swausea, g. s Colo Tamarack, c Micti	1,250,000	50,000	25	520,000 A or il	35 3.00	3,160,000	Nov	892 .00 891 011	168	SI	skiyou Con., L Cal	2,000,000	60,000 200,000	10	13,000 Å	lay 18	92 .	0136
69 70	Tombstone, G. s. L Ariz United Varde, C Ariz	12,500,000 3,000,000	500,000 300,000	25 10	*		1,250,000 207,500	April Jan.	882 .10 892 .10	* 170 171 172	Sc Sc	uth Hite, g Cal	10,000,000	100,000	100	195,000 J	au. 18	80	05
72	Viola Lt., s. L Idaho Ward Con., s Colo.	2,000,000	150,000	10 10		••••	837,500 20,000 25,000	Dec. 1	889 .05 889 .05	9 175 174	St	Anisinus, G Cal Kevin, S. G Colo	2,000,000 100,000	200,000	10	:			
74 75 76	W. Y. O. D Cal " (ankee Girl, s Colo.	90,0,00 1,300,000	15,000 260,000	45	22,500 May.	1891 .10	42,000	Dec. I April I	892 .10 891 1.50	175	St	Louis & St. Elmo. Cole L. & St. Felipe, g.s. Mer	,000,000 000,000 *(.).000	200,000	10 .				
74	Yeliow Jacket, G. s. Nev Yosemite No. 2 Utah.	12,000,000 1,000,000	120,000 100,000	10L 10	5,808,000 Sept.	1892 .20	2,184,000	Aug. 1 Oct. 1	871 1.50 891 .05	178	St	L. & Sonora, G. S., Ariz, en.winder, l. s Idsho	3,000,000 500,000	300,000 500,000	10	*			
79	coung America, G Jai				•••••	••••		· · · · · ·	1.00	180	su Sv	lilvan Con., G Dak lvanite, s.	1,250,000 600,000	50,000 200,000 500,000	3	*			•••
										182 183 184	Ta	ylor-Plumas, e Cal legraph, g. s Cal	\$25,000 325,000	65,000 65,000	5	3,575 M	ar . 18 ar. 18	92 . 92 .0	Dix 116
										185	Te	legraph, G. s Mex resa, G. s	100,000	100,000 200,000	1 5	70,000 F 10,000 F	eb. 18	92 .1 85 .	0
										187	TO.	rnado Con., G. S Nev scarora. S.	10,007,00.	100,000	10 1 20	295.000 M	ay 18	494 492	ක් 25
	******									189 190 191	Un Ut	ton Con., G. 8 Nev ah, s Nev	10,000,000	100,000 1	00	370,000 J	une 18 ug. 18	92	北方
	••••••				•••••					192 193	Val	liey, g Colo	1,000,000 575.000	509,000 460,000 1	25.	1,501 M	ar. 18	92 00	18
	· · · · · · · · · · · · · · · · · · ·			•••						194 195	Wa	shington, C Mich	1,000,000	40,001	F				
	*** * *** **** *****									197 198	We	st Granite Mt., s Mont.	500,000	100,000	5 10	*			
										199 200 Y	v 0 Y u Zel	ma, C. S. G Idaho Ariz	10,000,000	200,000	2	3,000 A	ug . 189		
+1				-++J							-					1		1	, °

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † This company, as the Western, up to December 10th, 1881, paid \$1,400,000. ; Non-assessable for three years. § The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. Previous to the consolidation in August, 1884, the California had aid \$31,320,000 in dividends, and the Cons. Virginia \$42,30,000. ** Previous to the consolidation of the Copper Queen with the Atlanta. August, 1885, the Copper Queen had aid \$31,320,000 in dividends. This company paid \$190,000 before the reorganization in 1880. ** This company caulted the property of the Kaymond & Ely Company when had paid \$3,075,000 in dividends. ** Previous to this company's acquiring Northern Belle, that mine declared \$2,400,000 in dividends against \$42,50,000 in assessments

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THE ENGINEERING AND MINING JOURNAL. FEB. 18, 1893.

	co	AL,	RAII	LWA	Y A	ND	отн	ER	STC	CKS	5.				co	AL,	RAIL	WA	Y AI	ND	отн	ER	STC	оска	6.		
	Fel), 11,	Feb.	. 13	Feb.	14.	Feb	. 15.	Fel	0. 16	Feb	. 17.		NAME OF	Feb	. 11.	Feb	13,	Feb	. 14.	Feb	. 15.	Feb.	. 16.	Feb	17.	
NAWTS OF STOCKS.	Ħ.	L.	H.	L.	н.	L.	н.	L.	н.	L.	н.	L.	Sales	STOCKS.	н.	L.	н.	L.	н.	L.	н.	L.	н.	L.	н.	L.	SALES.
Adams Express			160	158			160	158%					77	N.Y.,Chi. & St.L.	173%		18										825
Albany & Susq. Am. B'k Note Am Coal				······		4012	401/	 		478/		451/		do. 1st pref do. 2d pref N. Y., L. & W N. Y. I. F. & W.	2456	2436	25	2416	25	2436	215	241/2	24%	211/6	2456	21	15.410
Am. Cotton Oll. do. pref Am. Express	82	811/2	83 11958	8184	84		82%	8134	83%	821/2	8258	82	4,767 100	do. pref N.Y. N.H.& H'rt N.Y. & N. Eng.	55 	493/8	4934	493%	.256 5034	4936	56 258 4984	4814	49	4584	4574	4234	105 131 99,850
Am. Sugar Ref. do. pref	133 10334	131½ 103	13256 10284	13156	1321/8 1035/8 90	130 10258	$12984 \\ 103\%$	12614	128 103 90	1235_{6} 1025_{2}	12474 1027/8	121 10256	403,155 2,554 20	N.Y., Susq. & W. do. pref N.Y. & North	1936 695g		1914 69	193/8	1914	19	19 68	•••••	1834 6814	1834 6784	18 65	1734 6736	3,045 2,100
Am. Tobaceo. do. pref Atch., T. & S.F.	112 10756 3459	104 107 84	11.8	104 3434	106 19756 3436	105½ 34	106 34	105 3384	106 10634 343/8	1051/2	106	105%	22,247 100 20,365	do pref Norfolk South N. & West	321/6		3234	32;4	32% 	319%	3136		•••••		·····		1,800
Atlantic & Pac. Balt. & Ohlo do pref			941/2	••••			334 95	9434	33 <u>6</u> 95			• • •	400 1,000	do. pref Nor. Amer. Co North Pacific	101-6 18 497/	1098	10% 18 497.5	1014	1044 1856 4887	1814	10% 17% 487	10 1784 4846	10?4 173/8 4826	1756	1734	175%	3,410 1 200 28 465
Balt. & O., S.W. do. pfd B., C., R. & N.		·····			 60		· · · · · ·				•••••		3.0	Ohio & Miss Ohio & Miss Ohio Southern	184		2314	1814	1836	1824	18%	1834	18%	183/4	22	1834	2.993
Bos. A. L. prd Bnff. R. P do. pref	36		••••	•••••			3534	33	10194		851/8	85	1,275	Ore, R. & N			78										45
Canada South.	86 56%		86 563 <u>ś</u>	56	5656		56	55348	86 5538	553%	86 55½	55	1,200 4,405	U. N Pacific Mail Penn. R. R	223/8 545/8	223/8 543/6	24 5434	5498		· · · · · · · · · · · · · · · · · · ·	2136 24 545s	5434	243 <u>6</u> 5434	233/8	257/8	2514	$135 \\ 1,380 \\ 4,288$
do. pref CentialPaeifie Char. Cel. & A.							27						5	Peoria, Dec. & Ev. R Phil. & Reading.	17 4598	4794	173⁄2 49	17 48½	1734 4834	473/8	17 4736	463%	1724 4798	461/4	17 4634	4056	970 674,040
Ches. & Ohio do. 1st pref do. 2d pref	2334 6216	2336	23748 63	2536 621/2	2374	2316	2336	2314	233;	23%	23%4	23	12,429 64	Pitts., F.W. & C . Pitts. & W., prf P., C., C. & St. L.			•••••	•••••	•••••• •••••		333/2						
Chic. & Alton do. pfd Chic Burl. & Q.	11334	11276	10014	993%	1003/8	995%	9334	9534	995	993%		967%	32,318	do. pref Puliman P. C. Co	19734				198		198		196		1963-5		550
Chie. & East III. do, pref Chie. Gas Trust.	159 91	69 8974	6810 10418 9130	9034	9136	903/8	90%	89	9036	8916	9014	8756	400 104 €2,285	Rich. & W. P do. pref Blo Grande & W	10	93%	1036	956	101/4 38	\$34	57/ 314	914	936 375	938 3539	994	91/4	12,974 850
do, pref Chie. & N'west.	11354	1027/8	123)4 11556	1123%	113%	1123/8	12354 11358	123 11256	11238	1123%	1231_4 1123_4	1123/8	1,130 10 540 10	do. pref Rome, W. & O So, Cotton Oll,			561%				1103.		11134				300 500
Chie., R.I.& Pac. Chi., S.P., M.&O. Chi., Stock Yds.	851.9	\$4\$4	8556	843%	851/2	84%	8436	84	841 <u>2</u> 101	8334	8434	831/8	44,358	So. Pacific St. L. & San. Fe. do. pref	. 33	33	333/8	33	33	311/2	324	3194	325%	3194	3198	3196	2,150
do. pref Cit. Gas, Bklyn. C., C., C.& St. L.	513-6		5494		5514	541%	5454	5334	54	5334	5334		4,353	do. pref St. P. & Duluth			14		44,6	• • • • •	13%	1314	1358 4156	•••••	13		200 600 200
do. pref Clev. & Pltts Col. C. & 1	231.8		97 24		2436	24	97 23%	2314	2356	2314			23	St. Paul, M.&M St. Paul &Omaha	115	114 563/8	116 5734	11554 5634	11694 5694	5534	116 56	5178	116½ 56	11594 5494	11534 557e	531/2	2,721 29,955
Col. Coal. Colorado Fuel do. pret	6934 11.8	69	311/2 111	691/4 109	72 11014	7114	711/2	70%4	72 2017	71	7034	70 9017	8,585 600 2,210	Tenn. C. & I do. pref Tol & O. Cent	8514		351,4	85	35 103	3134	35}4	343.6	35	* 3494	3474	34%	4,900 15
do. pfd Col. & H. Coal	72	235%	23%	2394	74 24	71 23	2334	23%2	23	2298	214	29:4	3,210 300 3,500	do. pref Texas Pacific do. Land Tr					95%			934	1.56	935			1,045
Commer.Cable. Cons. Coal.		13234	13434	134	135	134	13356	133	13336		13214	131	4 4 17	Tol., A.A.&N.M Tol., St.L.& K.C. go. pref	3894	381,6	39 30	3816	39 9	355%	3814	3734	3814	3794 	3794	3756	5,120 200 101
Del. & Hud. C Del., L. & West. Des. M. & Ft. D.	133 15234	132% 152	1343 15298	1517%	134 15294	132 15)3%	13216 15214	13116 15116	1\$3 152½	132 151	1331 <u>6</u> 1513 <u>4</u>	18184 151	4,940 12,278	Union Pacific do. Den. & G U. S. Express	3974 163-9 68	395 1584 67	403/8 16 68	339%	403% 15% 68%	39%	15% 68%	3895	3194		40 69	89 (81/2	1,983 519 330
Denv. & Rio G . do pref Dls. & C.F. Tr'st	5436 3834	3758	401/2	381/8	4014	383/8	54¼ 3834	37	5484 387/a	5414 37	551/8 38	5414 361⁄2	2,445 119,552	do. pref Wab., St.L.& P	12	44	46 95% 12%	45 12 95	4038 1216 2536	40	40	4479	94 12.4 2.4	12	54	2476	2,170 170 1,962 9,011
do. ex-div Dul., S. S. & A do. pref					1234	12						•••••	200	Wells, Fargo Ex Western Union.	971/2	2534 96	977/8	963.8	148 9784	9694	148 9634	98	9134	9634	97	155%	290 38,187
do 1st pref do. 2d pref Edison III Co	936		10	956		972	2642 934		472		91,6	•••••	100 720	Wheel. & L. E do. pref Wisconsin Cent.			657/				19%	1936	19%	1994	+81/g		651 203 339
of N. Y Edison E.L.Co. Edison Gen El.	125%	125	126%	1251/2 110/4	126½ 110¼	11056	1253% 11054	124	1251 <u>6</u> 110	125 107	109	10734	1,674 19,701		1	1		Tota	l shar	es sold	1, 2,337	,010	1	1			
do. pref Erie & West Evans. & T H	145		1447%	14456	145	144	14536	144	148	145		· • • • • • • • • • • • • • • • • • • •	1,960	San	Fran	cisc	u, Ca	1.				Fore	lgn	Quo	atio	ns. F	eb. 8.
do. pref Gt Nor. pref. Green B & W.			142	14134			1111/2		140				1,031	NAMES OF STOCKS. Feb.	Feb	Feb.	Feb	Feb	Feb	Ala	aska	Tread	well.	Н	£21/4	st. L	ed owest.
do. t. r G. B. & W., pref do. t. r			13	1234	1294	121,6					12		1,600	Alta15	.15	.15	.15	.15	20	An Ca	neriea n. Ph	ospha	lle, C te, C	olo an	18. 9	1.	1s. 3d.
Houston & Tex. Hunt. & B. Top. do pref	37 543		8716 534				54						742 370	Belle Isle B. & Belch 1.40	1.40	1.3	1.30	1.25	1.50	· De	Lam	ar, Id Cust	aho er, Ida	aho.	£1%	£	11/4
Int. Cond.& Ins Int. Cond.& Ins Iowa Central	91	9954	99%		6436 934	64	647%		100%		91/4		2,639 300 300 125	Bulwer10 Chollar50 Com'w'ith	.10	.10	.19	.10	.10	Ea Eb Ell	gle i erhai khorr	dt, N	ev	• • • •	£116	£	1,3
Kan'wha&Mich Keokuk, D. M. Laclede Gas	2:23	931			2984								1.116	Con.C.&V. 2 60 Con. Pac Crown Pt60	2.55	2.50	2.50 	2.35	2.35	En Es Es	mera nera	Utah Ida, N ff. Uta	vev	••••	ls. 		6d.
do. pref Lake Erle& Wes do. pref			2374				79		235	23	23 78		430 244	E'rekaCon G'ld & C'y .90	50	.85	.83	.80	· ·····	Go	den Ha	Leaf, wk, M	Mont		9s 6d		89. 6d.
Lake Shore Lehigh C. & N. Lehigh Valley.	. 1283 543 603		. 12884 . 54 . 60%	128 <u>%</u> 60%	129	12884	12816 5414 5934	128 54 59%	12171	12734	127% 	12734	4,170 527 4,293	Hale & N., 1.26 M. White., Mexican., 1.75	1.20	1.20	1.65	1.10	1.20	. La Ma	Plai aid of	a, Co Erln,	lo Colo		18. 3d £13-16		9d. £11-16
do. ex-div L. Erie & St. L	25				110	109	109		109				103	Mt. Diablo Navajo						Ma Ma Ma	ount lontan	MeCle a, Me	ellan.		48. 38. 6d		6d. 3s. 2s. 6d.
Louisv'ie &N'si Louis., E. & St.I do pref	1 743	6 735	s 745	4 733 _{/4}	7434	7334	741%	74	755	749	75%	73	83 845	N.B'lleIsle N. Co'w'th Ophir 2.15	2.10	1.90	1.90	1.85	1 90	Ne Ne	w Co w Gi w Ho	nsolid iston, ovei	Colo. Hill, 1	N.C.			
L., N. A. & C L., St. L. & T Mahoning Coal	. 25		. 25		247/		241%	24	243	24	24	233	1,545	Potosl 1.40 Savage90 Sierra Nev 1.30	1.40 .90 1.25	1.35 .90 1.20	1.35 .90 1.20	1.30 .80 1.15	1.30 .85 1.25	Ne	w Ri w Vi	ola, I	N.C.				••••
do. pref ManhattanCon Maryland Coal	164	£ 162)	6 164	1631	163	158	160	156	1613	6 1573	1 16034	1585	¢ 23,346	Unl'n Con 1.00 Utab 15 Yel. Jack .70	1.05	1.00 .15 .60	1.09 .15 .60	.90 .10 .60	.95	Pa	rker	Gold, rg Co	N. C. ns., N	lev.	•••••		
Memphis Char	£								111					R	ltim	lore.	Md	F	eh lé	= Pl Ri	umas	Euro nd C	on., N	al. 1 ev. s	08. 18 35%	£	98. 1/8
Minnesota iron do pref	. 65		. 1065	4			105		105		. 105		14	CCMPANY. Balt. & N. C.			Bld.	·	Asked		iby, l erra l ' Pl	Sutter umas	, Cal Eur.	Cal.	7s.		58.
do pref														Corrad Hill Cons. Coal	k Cos		.28		.1		ited	Mexi Girl	ean. I	Mex.	2s. 6d.		1s. 6d.
M., Kan. & Tex do. pref Missouri Pac		\$ 56	-25 561		25	561	1434 25 5514	243	113 1 25 8 56	145 555	\$	553	1.375 1,024 4 7,593	Howard C. & Lake Chrome	C	•••	1.10			5		out	0010	Pari	8.	F	eb 6. France
Mobile & Ohio Morris & Esser Nat. Cord. Co.							135		1533				100	suver valley.	it. L	ouis	2@.8	Fel	b. 15.	Be	elmez	Spai	Ure.				. 620.00
do. pref do. New Nat.Lead Co	115 735 485	6 72 6 47)	1154	4 1111 6 723 8 48%	4 1143 6 733 4 493	114 711 478	114 71 4 48	1121 67 473	693 6 463	8 67 4 431	67 67 8 44	110 613 42	2,88 124,42 78,48	The closing	quota	ations	were	as fo Bld. 1	Asked		uriu	m, Gi	parts			•••••	. 30.0
Nat.Lipseed Ol Nat. Starch	ii	• • • • • •	. 393	\$ 391	· 39 · 39 · 24	939 355 22	8 384 2054	8 38 203	· 94 38 6 21	333		913	2,90 3,45	American & Bi-Metallic, M	Nettl Iont.	e, Co	lo 8	.211/2	.25 8.75	N	lekel.	New	arts. Caled	lonla	•••••		91.2 2.4 792.5
do. 2d pref New Cent. Coa N. C. & St. L	1		89				834	82	82				. 85	Granite Mou	ntain,	Mon	t	.42½ 1.00 3.50	.47 4.60 3.80	2 R.	e Tin	to, Sj	ollg,				. 393.7 . 517.0 . 512.5
N. J. Central N. Y. Central	1261	126	4 1264 110	126	125	J	126	1243	6 126 110	1093	1253 1098	125	2,52	Montrose Pl. Pat Murphy.				.05	.08	V	harsh	Mont	in	Bel	dum.		. 116.0