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

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TWENTY-EIGHT gold, silver, copper, and quicksilver mining companies, which make public statements, paid dividends during June to the amount of \$1,341,691, and sixty-six companies paid \$7,152,251 in dividends during the first six months of the present year. This amount is considerably in excess of that paid during the same time last year, and there is prospect that it will be surpassed during the second half of this year.

The great length of Mr. Carnegie's article on free coinage of silver, or rather on the A B C of money, has prevented the publication of other articles. Next week we shall publish answers to Mr. Carnegie, by Senator Wm. M. Stewart, of Nevada, and others. Readers of the ENGINEERING AND MINING JOURNAL should carefully preserve their files of the JOURNAL which will contain a full discussion of this important subject, giving the views of both advocates and opponents of free coinage of silver.

An event of considerable interest in the steel rail trade is the rolling of a 10,000-ton lot of steel rails weighing 95 lbs. to the yard by the Bethlehem Iron Company for the Boston & Albany Railroad Company. These are the heaviest rails yet rolled in this country, although some of slightly greater weight are used abroad. These rails are to be tested by a drop of 2,100 lbs. from a height of 40 ft. Another interesting feature in connection with their manufacture is the fact that they are being made of a higher carbon and consequently harder steel than usual.

In a recent statistical report upon the foreign trade of China for the year 1890 Mr. E. MCKEAN, Statistical Secretary of the Imperial Maritime Customs, makes some interesting remarks concerning the movements of precious metals in that country. He estimates that during the past three years the surplus value of exports has been about \$5,042,000, while there has also been an export of gold amounting to about \$6,406,000 and imports of silver of only \$677,000. It is to be remembered, moreover, says Mr. MCKEAN, that during this time China paid away in foreign places considerable sums in cancelling old loans without contracting new ones and also in other official disbursements, as for arms, ships, etc. The only manner in which this discrepancy in Chinese trade statistics can be accounted for is by the theory that the gold and silver necessary to meet the balances were brought in from America and Australia by Chinese passengers, and so escaped record in statistics as imports. It is well known that the Chinese who have emigrated to this country remit home largely in gold and silver coins, practically all of their surplus earnings being disposed of in this manner.

WITH the market price of silver at 98.61 cents per ounce troy, the ratio between gold and silver would be 21 silver to 1 gold, as against the United States coining ratio 16 to 1; but the world's production by weight is as 22 silver to 1 gold, which would make the value of silver nearly 94 cents per ounce. The present ratio of production in the United States is 32.32 silver to 1 gold. On this basis the value of silver would be about 66 cents per ounce.

The cause of the relative depreciation of silver as compared with gold is easily understood from a study of the following table:

PROPORTIONS IN WHICH GOLD AND SILVER HAVE BEEN PRODUCED.

	In the United States		In the World.	
	By weight.	By weight. Gold, Silver.	By U. S. Coining Value Gold, Silver.	
1850.....	1 to 0.016	1 to 16.00	1 to \$1.00	
1860.....	1 to 0.032	1 to 5.47	1 to 0.34 ¹ / ₂	
1870.....	1 to 5.12	1 to 5.79	1 to 0.48 ¹ / ₂	
1880.....	1 to 17.44	1 to 14.2	1 to 0.89	
1889.....	1 to 32.32	1 to 21.92	1 to 1.37	

At one time silver was at a premium as compared with gold, because it was not produced in sufficient quantity to supply the demand. Now, on the contrary, the output exceeds the demand, and the price has declined. Yet the free coinage advocates would reduce the demand by stopping moderate purchases by the government, and would simply bring our silver coins down to the basis of bullion.

LEAD AND ZINC MINING IN THE UNITED STATES.

THE great lead and zinc industries of the country are so important that great interest attaches to the statistics of their production. While the number of lead and zinc mines and works being so small, comparatively, it was hoped that the census investigation would have secured very full and accurate information concerning them. The bulletin just issued from the Census is therefore somewhat disappointing, for while some of its shortcomings are excused by frequent reference to the difficulty or impossibility of getting the full and accurate information desired, yet the work bears internal evidence of having been done in a perfunctory manner, and without an adequate appreciation of the importance of the investigation or of the responsibilities of a statistician. It is to be hoped that these defects are only in the bulletin now issued, and that the final report will contain that fuller information, better arranged, which we have a right to expect from so able and experienced a statistician as Mr. KIRCHHOFF.

The lead-producing mines of the United States are properly divided into two classes, those of the Rocky Mountain States, in which the lead carries gold and silver, and those of the Mississippi Valley States, in which the lead occurs alone or in conjunction with zinc. In the former, data have been collected as to the lead contents of ores and their value, and for the nine States and Territories of this section, producing lead, the output has been given in counties. In the case of the Mississippi Valley States, however, the data show the amount of ore produced and its value. This change in the system of compilation is said to be made for the reason that while the ores of the Rocky Mountain region are purchased by assay, so that their lead contents are easily reported, those of the non-argentiferous lead mines of the central States are bought without exact determination of their lead contents, although "the reports of the smelters in those districts indicate their grade quite clearly." This change in the method of compilation of these statistics has already led to at least one error in summarizing the lead production of the country, where, in this bulletin under the caption "Lead Ore," we find the pig-lead output of six Rocky Mountain States.

The production of lead ore in the States of the Mississippi Valley is also given by counties, so far as Wisconsin, Missouri, and Kansas are concerned, but that of Illinois, Iowa, and Virginia is given by States and only

in a general summary, no mention of the production of these three States is made in the text.

A similar criticism may be made of the tables of the production of zinc ore. In the western group of States this is given by States and counties, while in the eastern and southern groups by groups only.

The labor statistics are very defective. This is stated to be due mainly to the conditions of mining in the central States, as lead and zinc are in a majority of these mines produced from the same openings, and no separation of the mining expense could therefore be made. These statistics are given for Wisconsin, Kansas, southeastern Missouri and the Eastern and Southern groups of zinc mines.

In the statistics relating to the smelting and refining of lead and the production of spelter and zinc-white, the confusion becomes still greater. Mr. KIRCHHOFF says in explanation: "The operations of lead smelting and refining are so inextricably mixed, and are, besides, so often conducted in connection with the parting of the precious metals, that it is quite impossible to present tables covering the operations for the whole country." He has consequently prepared statistical tables of the lead smelters by groups, which are interesting and valuable, although those of the Colorado group are perplexing. The aggregate of mine smelting works comprising this group does not correspond with the sum of the aggregates of the two sub-groups—Leadville and Valley—into which it is divided. We know, however, that there were four smelting works in Leadville in operation in 1889, and five in the Valley, two being at Denver and three at Pueblo. The Durango works were also in blast during that year.

The statistics of the base bullion production of the entire country are incomplete because two smelting and refining works which reduced a considerable amount of ore were unable to state the lead contents of this ore. The portion of this report which relates to the details of lead desilverizing and refining is almost unintelligible and practically valueless.

The statistics concerning the zinc smelting and zinc oxide industry are better arranged, but no separation is made between spelter and zinc oxide, and consequently we know nothing of the cost of production of either.

The census investigation finds the total production of zinc in the United States in 1889 to have been 58,860 tons, while the ENGINEERING AND MINING JOURNAL statistics published two days after the close of the year (see ENGINEERING AND MINING JOURNAL, January 2d, 1890) gave the production as 58,788 tons, or within 72 tons of the total obtained by the elaborate census investigation. This is a satisfactory confirmation of the ENGINEERING AND MINING JOURNAL reports.

THE SILVER QUESTION.

The world's annual production of gold is about \$119,000,000, and it has varied but little from this figure since 1860, when it was \$119,000,000, though it went down in 1874 to \$91,000,000 and in 1883 to \$95,000,000.

The production is increasing, not diminishing, which contradicts Senator Stewart's statement; neither is the gold produced chiefly used in the arts, as he states. On the contrary the coinage and recoinage of gold exceed the production by many million dollars a year, owing to the recoinage of old coins and gold previously used in the arts. Nearly the whole of the gold and of the silver produced in the world is now and has always been used for coinage, as the following table of the world's production and coinage and recoinage of gold and silver taken from the reports of the Director of the Mint shows:

	GOLD.		SILVER.	
	Production.	Coinage.	Production.	Coinage.
1887	\$105,301,955	\$124,992,465	\$124,365,978	\$163,411,397
1888	109,927,950	134,827,740	112,333,639	131,922,314
1889	118,831,559	167,731,286	162,915,253	132,280,659

Silver taken at U. S. coining ratio, 16 to 1 of gold.

The adoption of free coinage of silver could not therefore add much, if any, to the amount of silver now actually used in coinage. The chief difference would be that, so long as silver in coins would buy more than silver in bullion bars the producers of silver would get the difference instead of the whole people getting it, as is now the case.

If the buying power of silver here under free coinage were greater than that of bullion, then all the silver bullion in the world would come here to get this greater value. If, on the other hand, the value of silver in coins under free coinage of silver were no higher than that of bullion, which now is about 86 cents for the silver in our dollar, then what advantage would the silver producers gain? While the probability, nay the certainty, is that if this country should adopt free coinage, the gold value of the silver in our dollar would decline to perhaps 50 cents, then every one but the speculators would lose. All the gold would disappear the moment a silver dollar could not be exchanged for a gold dollar, and as the stock of gold coin in the United States, November 1st, 1890, was

\$634,010,285—and the stock of silver coins was \$458,134,057—it is easy to see what a panic and overwhelming disaster would befall this country were the gold to disappear. No, thank you, gentlemen; no free coinage for us until all the great nations join us in it.

THE NEW FLORIDA PHOSPHATE LAW.

The bill regulating the mining of phosphate rock in the beds of the navigable rivers of Florida, to which we referred in our issue of April 11th, was passed by the legislature last month, on the last day of the session, and having been signed by the Governor has become a law. By its provisions the Governor, Comptroller, and Attorney-General of the State are constituted a Board of Phosphate Commissioners, which has the management of the phosphate interests of the State in the beds of the navigable streams. The right to mine these deposits is to be granted upon the following terms: for each ton of rock analyzing less than 55 per cent. phosphate of lime, the State is to receive royalty of 50 cents; for rock analyzing between 55 per cent. and 60 per cent. phosphate of lime, 75 cents; and over 60 per cent., \$1, accounts and payments to be rendered quarterly to the State Treasurer. The Board is authorized to grant the exclusive right to mine rock from the beds of navigable streams, within certain well-defined limits, in no case exceeding 10 miles by course of stream, for a period not to exceed five years, preference being given to riparian owners and to those who have commenced or prepared to mine in good faith before the passage of the act. Provision is made for the appointment of an Inspector of Phosphates as the executive officer of the Board, and suitable penalties are imposed for non-compliance with the terms of the law.

As was to be expected, this law has elicited much opposition, and will undoubtedly lead to litigation between the State and many of the companies which claim vested rights in the river phosphate deposits. Very many of the mining companies are unaffected, however; the law not applying in cases of navigable streams or parts thereof that are not meandered and the ownership of the lands embracing which is vested in a legal purchaser.

It is not probable that the burden imposed by the new law will have serious effect upon the industry. As we have pointed out in previous issues, the Florida river phosphate can be produced and loaded upon vessels at Gulf of Mexico ports as cheaply as South Carolina rock at Charleston. Under the present conditions, the former paying a royalty of \$1 per ton and the latter \$2, the relative position of the two is the same as before the passage of the new laws in each of the States, the advantage still being strongly in favor of the Florida rock. Whatever may be the result of the new Florida law, the industry is likely to make great progress in that State during the present year. The trouble in South Carolina between the State and the Coosaw Mining Company is still unsettled, and river-mining industry there is practically at a standstill, Florida rock taking its place in the market to a considerable extent.

BOOKS RECEIVED.

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

A Course of Mineralogy for Young People. First, second and third grade. By G. Guttenberg, Pittsburg Central High School. 16, 45 and 57 pages; with collection of minerals, No. 1, first grade. Second edition. Published by author. Pittsburg, Pa. Price \$1.25.

An Expedition to Mount St. Elias, Alaska. By Israel C. Russell. Illustrated, 150 pages. Published by the *National Geographical Society*, Washington, 1891. Price, \$1.50.

An Introduction to the Study of Metallurgy, by W. C. Roberts-Austen, C. B., F. R. S. Illustrated, 292 pages. Published by Charles Griffin & Co., London, and J. B. Lippincott Co. Philadelphia, 1891. Price, \$2.50.

Annual Statistical Report of the Secretary to the Members of the British Iron Trade Association on the Home and Foreign Iron and Steel Industries in 1890. 108 pages. Published by E. & F. N. Spon and British Iron Trade Association. London, 1891. Price, \$2.00.

Emploi des cables continus pour l'extraction dans les mines. Par V. Watteyne et A. Demeure. Illustrated, 44 pages. Published by Imprimerie Veuve Monnom, Brussels, 1891.

Experimental Investigations by the State Board of Health of Massachusetts upon the Purification of Sewage by Filtration and by Chemical Precipitation and upon the Intermittent Filtration of Water. Made at Lawrence, Mass., 1888-1890. Part II. of Report on Water Supply and Sewerage. Illustrated, 910 pages. Boston, 1890.

On the Representation of the Mean Yearly Temperature of a Place as a Function of its Geographical Longitude and Latitude. By W. Schösch. Translated, with an introduction, by Frank Waldo. 22 pages. Published by the Register Publishing Company, Ann Arbor, Mich., 1891. Price, 25 cents.

Sixth Biennial Report of the Bureau of Labor Statistics of Illinois, 1890. 420 pages. Springfield, Ill., 1891.

Special Inquiry into the Zone Railway System. Reprinted from the *Glasgow Evening Citizen.* Illustrated, 44 pages. Glasgow, 1890. Price, 6d.

State of Michigan. Mines and Mineral Statistics. By Charles D. Lawton, Commissioner of Mineral Statistics. 97 pages. Lansing, 1891.

CORRESPONDENCE.

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

Information Wanted.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: I would like to inquire if any of the numerous readers of your valued paper can furnish information concerning the present status of the following-named mining companies: New York and Maine General Mining, New York and Galena Lead, New York and Ohio Gold and Silver?

MARCUS BENJAMIN.

NEW YORK, July 6, 1891.

A New Iron and Steel Works on the Pacific Coast.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: It now looks as though a new iron and steel plant would be built in San Diego, Cal. At all events, the city is quite elated over the prospect. Dr. Charles J. Eames, of New York City, has been in San Diego for some time, and has held several consultations with leading citizens and committees of the Chamber of Commerce, and the matter has finally been decided by a large and enthusiastic meeting of citizens, by granting to Dr. Eames a subsidy of \$200,000.

Dr. Eames agrees to construct on the bay of San Diego a plant which shall have a capacity of 100 tons daily of blooms, merchantable iron and open-hearth steel. The operations will be carried on under his patents on what is known as the direct process; that is, making iron and steel from ore without blast furnace operations. Reverberatory furnaces will be used, crude petroleum being the fuel employed. Reference was made in the ENGINEERING AND MINING JOURNAL of Feb. 18, 1888, to the Eames process as carried out at the works of the Carbon Iron and Steel Company at Pittsburg, Pa.

The San Diego plant will be built by Dr. Eames and operated for a period of six months or longer, he agreeing to turn out \$300,000 worth of iron and steel before any portion of the subsidy shall be paid, which shall be used only in the extension of the works and not in payment for the original plant.

There would, undoubtedly, be a market for upward of 50,000 tons of the output of this plant annually, if it proves a success. The impression is that when it has been practically demonstrated that iron and steel can be produced on the Pacific coast at prices which will compete with Eastern rates, it will create an increased demand for a large class of structural iron, rails, steel armor-plates, and an endless variety of manufactured articles in both iron and steel.

There are now known two available sources of iron ore. One is located near the line of the Santa Fé Railroad, in San Bernardino County, Cal., from which a branch line of railroad will be built to the main line. The ore is said to occur there in almost inexhaustible quantity. It is high in iron (pure magnetite and hematite), and contains a very low percentage of phosphorus and sulphur. This ore has been pronounced by Cleveland and Pittsburg men to be of the very best quality. The other deposit is equally as extensive and in every way as desirable for industrial operations. It is located at Tepustete, in the valley of San Ysidro, Lower California, on the coast, less than 100 miles below San Diego. The ore can be loaded into ships and brought directly to this port at a very low cost. There are other deposits in the Southwest, but little is known of them at present.

The fuel to be used is the native product, crude petroleum, a very heavy oil, less desirable than Pennsylvania oil, but cheap and good enough for the purpose. As both ore and fuel can be delivered at the works at a low figure, the enterprise will have good chances of success.

In the Eames process the raw iron ore is taken as it comes from the mines. It is crushed to a fine powder, and is then mixed with some carbonaceous matter—pulverized coke, charcoal, or coke dust. The mixture is then put in a reverberatory furnace, about 3,000 pounds to a charge, and heated to a low red heat, at which it is kept for about an hour.

During this time the oxygen of the ore is freed, and uniting with the carbonaceous matter present forms carbonic acid, which escapes up the stack, leaving a mass of nearly pure spongy iron. At the end of an hour the heat is raised until the mass of iron becomes slightly viscid or plastic, in which condition it is rolled up and removed from the furnace and placed under a trip-hammer and quickly pounded into what is technically known as wrought iron bloom, which is afterward reheated in a furnace to a welding heat, when it is passed through the rolls, during which process it is manufactured into merchantable iron. Open-hearth and crucible steel are made from the blooms by the Eames processes.

Dr. Eames states that he can produce iron under somewhat adverse circumstances, that is, not the best obtainable conditions on this coast, at within one dollar of the best Pittsburg prices. The plant at first will employ about 200 men, which number will be increased when the plant is enlarged. It is looked upon as a nucleus about which many other industries will concentrate.

SAN DIEGO, Cal., June 23.

W. H. STORMS.

Heat from the Moon.—Mr. C. Vernon Boys has been making measurements of the heat of the moon by means of his very delicate radiometer, says the *Scientific American*. His method was to focus the rays of the moon on the face of the radiometer by a reflecting telescope of 16 ins. aperture. In the case of a new moon, he found that the heat coming from its disk diminished as passing from the convex to the concave edge, and that from the dark surface was so slight as not to affect the apparatus. The maximum radiation of heat came from points of the disk itself, not from its limbs. At full moon the maximum point was at the center of the disk. The side of the moon which had been exposed to the sun for 14 days was not warmer than that which had been exposed for seven days. No sensible heat was observed to come from the stars.

THE FREE COINAGE QUESTION DISCUSSED.

Mr. Andrew Carnegie has written an interesting and valuable article on "The A B C of Money" to the *North American Review* for June, from which we make the following extracts.

To get at the root of the subject, you must know, first, why money exists; secondly, what money really is. Let me try to tell you, taking a new district of our own modern country to illustrate how "money" comes. In times past, when the people only tilled the soil, and commerce and manufactures had not developed, men had but few wants, and so they got along without "money" by exchanging the articles themselves when they needed something which they had not. The farmer who wanted a pair of shoes gave so many bushels of corn for them, and his wife bought her sun-bonnet by giving so many bushels of potatoes; thus all sales and purchases were made by exchanging articles—by barter.

As population grew and wants extended, this plan became very inconvenient. One man in the district then started a general store and kept on hand a great many of the things which were most wanted, and took for these any of the articles which the farmer had to give in exchange. This was a great step in advance, for the farmer who wanted half a dozen different things when he went to the village had then no longer to search for half a dozen different people who wanted one or more of the things he had to offer in exchange. He could now go directly to one man, the storekeeper, and for any of his agricultural products he could get most of the articles he desired.

What we now call "money" was not much used then in the West or South, but you see that in its absence experience had driven the people to select some one article to use for exchanging other articles, and that this was wheat in Pennsylvania and tobacco in Virginia. This was done, not through any legislation, not because of any liking for one article more than another, but simply because experience had proved the necessity for making the one thing serve as "money" which had proved itself best as a basis in paying for a farm or for effecting any exchange of things; and, further, different articles were found best for the purpose in different regions. Wheat was "as good as wheat" for using as "money," independent of any law. The people had voted for wheat and made it their "money"; and because tobacco was the principal crop in Virginia, the people there found it the best for using as "money" in that State.

Please observe that in all cases human society chooses for that basis-article we call "money" that which fluctuates least in price, is the most generally used or desired, is in the greatest, most general, and most constant demand, and has value in itself. "Money" is only a word meaning the article used as the basis-article for exchanging all other articles. An article is not first made valuable by law and then elected to be "money." The article first proves itself valuable and best suited for the purpose, and so becomes of itself and in itself the basis-article—money. It elects itself. Wheat and tobacco were just as clearly "money" when used as the basis-article as gold and silver are "money" now.

We take one step further. The use of bulky products like wheat and tobacco, changeable in value, liable to decay, and of different grades, is soon found troublesome and unsuited for the growing business of exchange of articles, and they are therefore unfit to be longer used as "money." You see at once that we could not get along to-day with grain as "money." Then metals proved their superiority. These do not decay, do not change in value so rapidly, and they share with wheat and tobacco the one essential quality of also having value in themselves for other purposes than for the mere basis of exchange. People want them for personal adornment or in manufactures and the arts—for a thousand uses; and it is this very fact that makes them suitable for use as "money."

Now, because metals have a value in the open market, being desired for other uses than for the one use as "money," and because the supply of these is limited and cannot be increased as easily as that of wheat or tobacco, these metals are less liable to fluctuate in value than any article previously used as "money." This is of vital importance, for the one essential quality that is needed in the article which we use as a basis for exchanging all other articles is fixity of value.

Civilized nations soon felt the necessity of having their governments take certain quantities of the metals and stamp upon them evidence of their weight, purity, and real value. Thus came the "coinage" of metals into "money"—a great advance. People then knew at sight the exact value of each piece, and could no longer be cheated, no weighing or testing being necessary. Note that the government stamp did not add any value to the coin. The government did not attempt to "make money" out of nothing; it only told the people the market value of the metal in each coin, just what the metal—the raw material—could be sold for as metal and not as "money."

An ideally perfect article for use as "money" is one that never changes. This is essential for the protection of the workers—the farmers, mechanics, and all who labor; for nothing tends to make every exchange of articles a speculation so much as "money" which changes in value, and in the game of speculation the masses of the people are always sure to be beaten by the few who deal in money and know most about it.

Nothing places the farmer, the wage-earner, and all those not closely connected with financial affairs at so great a disadvantage in disposing of their labor or products as changeable "money."

When the use of metals as money came, it was found that more than two metals were necessary to meet all requirements. It would not be wise to make a gold coin for any smaller sum than a dollar, for the coin would be too small; and we could not use a silver coin for more than one dollar, because the coin would be too large. So we had to use a less valuable metal for small sums, and we took silver; but it was soon found that we could not use silver for less than ten-cent coins, a dime being as small a coin as can be used in silver; and we were compelled to choose something else for smaller coins. We had to take a metal less valuable than silver, and we took a mixture of nickel and copper to make five-cent pieces; but even then we found that nickel was too valuable to make one and two-cent pieces, and so we had to take copper alone for these—the effort in regard to every coin being to put metal in it as nearly as possible to the full amount of what the government stamp said the coin was worth.

But because copper and nickel change in value from day to day, even

more than silver, it is impossible to get in each coin the exact amount of value. If we put in what was one day the exact value, and copper and nickel rose in the market as metal, coins would be melted down by the dealers in these metals and a profit made by them, and we should have no coin left. Therefore we have to leave a margin and always put a little less metal in these coins than would sell for the full amount they represent. Hence all this coinage is called in the history of money "token money." It is a "token" that it will bring so much in gold.

I cannot take you any more steps forward in the development of "money," because in the coined-milled metals we have the last step of all; but I have some things yet to tell you about it.

Although one would think that in coined metal pieces we had reached perfection, and that with these the masses of the people could not be cheated out of what is so essential to their well-being—"honest money"—yet one way was found to defraud the people even when such coin was used. The coins have sometimes been "debased" by needy governments after exhausting wars or pestilence, when countries were really too poor or too weak to recover from their misfortunes. A coin is called a "debased" coin when it does not possess metal enough to bring in the open market the sum stamped upon the coin by the government. There is nothing new about this practice, which always cheats the masses. It is very, very old. Five hundred and seventy-four years before Christ the Greeks debased their coinage. The Roman emperors debased theirs often when in desperate straits. England debased hers in the year 1300. The Scotch coin was once so debased that one dollar was worth only 12 cents. The Irish, French, German and Spanish governments have all tried debased coin when they could wring no more taxes directly out of their people, and had therefore to get more money from them indirectly. It was always the last resort to "debase" the coinage. These instances happened long ago.

When a government issues "debased coin," it takes leave of all that experience has proved to be sound in regard to money. Sound finance requires the government only to certify to the real value possessed by each coin issued from its mints, so that the people may not be cheated. Every time the government stamps the words "One Dollar" upon 371½ grains of silver, it stamps a lie; disgraceful, but, alas! too true, for the silver in it is worth to-day not a dollar, but only seventy-eight cents.

Another delusion about money has often led nations into trouble—the idea that a government could "make money" simply by stamping certain words upon pieces of paper, just as any of you can "make money" by writing a note promising to pay \$100 on demand. But you know that when you do that, you are not making "money," but making a "debt"; so is any government that issues its promise to pay. And there is this about both the individual and the government who take to issuing such notes upon a large scale: they seldom pay them. The French did this during their revolution, and more recently the Confederate States "made money" at a great pace, and issued bonds which are now scarcely worth the paper they are printed upon. Every experiment of this kind has proved that there can be no money "made" where there is not value behind it. Our own country issued bonds, and the people of other nations bought them for forty cents upon the dollar, although they bore and paid interest at 6% in gold, so great was the fear that even the bonds of this country would not prove an exception to the usual fate of such securities issued during trying times. Only because the government kept strict faith and paid the interest and principal of these bonds in gold, and never in silver or in any depreciated currency, has the value of its bonds advanced, and the credit of the United States become the highest in the world, exceeding that even of Great Britain. There has never been a better illustration of the truth that in dealing with "money," as in everything else, "honesty is the best policy." Our government also issued some notes known as "greenbacks." But the wise men who did this took care to provide a fund of one hundred million of dollars in gold to redeem them, so that any man having a greenback can march to the treasury and receive for it \$1 in gold.

But I am now to tell you another quality which this basis-article of metal has proved itself to possess, which you will find it very difficult to believe. The whole world has such confidence in its fixity of value that there has been built upon it, as upon a sure foundation, a tower of "credit" so high, so vast, that all the silver and gold in the United States, and all the greenbacks and notes issued by the government, only perform 8% of the exchanges of the country. Go into any bank, trust company, mill, factory, store, or place of business, and you will find that for every \$100,000 of business transacted, only about \$8,000 of "money" is used, and this only for petty purchases and payments. Ninety-two per cent. of the business is done with little bits of paper—checks, drafts. Upon this basis also rest all the government bonds, all state, county, and city bonds, and the thousands of millions of bonds, the sale of which has enabled our great railway systems to be built, and also the thousands of millions of the earnings of the masses deposited in savings banks, which have been lent by these banks to various parties, and which must be returned in "good money" or the poor depositor's savings will be partially or wholly lost.

The business and exchanges of the country, therefore, are not done now with "money"—with the article itself. Just as in former days the articles themselves ceased to be exchanged, and a metal called "money" was used to effect the exchanges, so to-day the metal itself—the "money"—is no longer used. The check or draft of the buyer of articles upon a store of gold deposited in a bank—a little bit of paper—is all that passes between the buyer and the seller. Why is this bit of paper taken by the seller or the one to whom there is a debt due? Because the taker is confident that if he really needed the article itself that it calls for—the gold—he could get it. He is confident also that he will not need the article itself, and why? Because for what he wishes to buy the seller or any man whom he owes will take his check, a similar little bit of paper, instead of gold itself; and then, most vital of all, every one is confident that the basis-article cannot change in value. For remember it would be almost as bad if it rose in value as if it fell; steadiness of value being one essential quality in "money" for the masses of the people.

When, therefore, people clamor for more "money" to be put in circulation—that is, for more of the article which we use to effect an exchange of articles—you see that more "money" is not so much what is needed.

Nobody who has had wheat or tobacco or any article to sell has ever found any trouble for want of "money" in the hands of the buyer to effect the exchange. We had a very severe financial disturbance in this country only three months ago. "Money," it was said, could not be had for business purposes; but it was not the metal itself that was lacking, but "credit," confidence, for upon that, as you have seen, all business is done except small purchases and payments which can scarcely be called "business" at all. To-day the business man cannot walk the street without being approached by people begging him to take this "credit" at very low rates of interest: at 2% per annum "money" (credit) can be had day by day. There has been no considerable difference in the amount of "money" in existence during the ninety days. There was about as much money in the country in January as there is in March. It was not the want of money, then, that caused the trouble. The foundation had been shaken upon which stood the \$92,000 of every \$100,000 of business. The metal itself and notes—real "money," as we have seen—only apply to the \$8,000. Here comes the gravest of all dangers in tampering with the basis. You shake directly the foundation upon which rests 92% of all the business exchanges of the country—confidence, credit—and indirectly the trifling eight per cent. as well which is transacted by the exchange of the metal itself or by government notes; for the standard article is the foundation for every exchange, both the \$92,000 and the \$8,000. So you see if that be undermined, the vast structure, comprising all business built upon it, must totter.

I have finished telling you about "money." We come now to apply the facts to the present situation, and here we enter at once upon the silver question; and I am sure you are all attention, for it is the most pressing of all questions now before you. You see that the race in its progress has used various articles as "money" and discarded them when better articles were found, and that it has finally reached coined pieces of valuable metal as the most perfect article. Only two metals are used among civilized nations as the standard metal—gold in some countries, silver in others. No country can have two standards. Centuries ago silver was adopted as the standard in China, India, and Japan, and more recently in the South American republics, and it still is the standard in these countries. When adopted it was a wise choice; silver had nearly double its present value, and was then steady, and it answered all the needs of a rural people.

The principal nations of Europe and our own country, being further advanced and having much greater business transactions, found the necessity for using as a standard a more valuable metal than silver, and gold was adopted; but as silver was used as money in many parts of the world as the standard, and used in these gold-basis countries for "small change," it was advisable for these nations to agree upon the value in gold which would be accorded to silver, and this was fixed at 15½ ounces of silver to one of gold. Please note that this was then as nearly as possible the market value of silver as a metal compared with gold as a metal. The nations did not attempt to give to silver any fictitious value, but only its own inherent value. And, more than this, each of these nations agreed, when the agreement came to an end, to redeem all the silver coin it had issued, in gold at the value fixed. Everything went well under this arrangement for a long time. The more advanced nations were upon a gold basis, the less advanced nations upon a silver basis, and both were equally well served.

What, then, has raised this silver question which everybody is discussing? Just this fact: that while the supply, and therefore the value, of gold remained about the same, great deposits of silver were discovered, wonderful improvements made in mining machinery, and still more wonderful in the machinery for refining silver ore; and as more and more silver was produced at less cost, its value naturally fell more and more; one ounce of it, worth \$1.33 in 1872, being worth to-day only \$1.04. It has fallen as low as 93 cents. It has danced up and down; it has lost fixity of value. To all countries upon a silver basis there have come confusion and disaster in consequence. The question in India, with its two hundred and eighty-five millions of people, is most serious; and you see how our South American republics are troubled from this fall in the value of their basis-article, by which all other articles are measured. Even the European nations which are upon a gold basis are troubled by this "silver question," for under the agreement to rate 15½ ozs. of silver as worth an ounce of gold some of these nations have had enormous amounts of silver thrust upon them. Most of them saw what was coming many years ago, and ceased to increase their silver; some disposed of a great deal of what they had, and placed themselves strictly upon the gold basis, but there are still in European countries \$1,100,000,000 of silver legal-tender coins, not counting the amount of "token" silver money used for small change. It is not safe to say that less than 25 ozs. of it would be found equal to 1 oz. of gold if put in the market, instead of the 15½-oz. basis upon which these countries have obtained it.

All European countries have been, and are still, trying hard to escape from silver. In 1878 those comprising the Latin Union, which fixed the price of silver—France, Belgium, Italy, Switzerland and Greece—finally closed their mints to legal-tender silver. Norway, Sweden, and Denmark in 1873 and 1875 ran out from under the silver avalanche, and now stand firmly upon a gold basis. Holland also, in 1875, took its stand practically upon gold. Austria-Hungary has not coined silver since 1879, except a small amount of "Levant silver thalers" for a special trade purpose. Even half civilized Russia took the alarm, and ran as fast as she could out of the silver danger, for in 1876 she shut her mints to the further coinage of the dangerous metal, except such small amount as China wished to take promptly from her. So you see that all those countries that have tried silver and found out the evils which it produces, and its dangers, have been, and are now, using every means to rid themselves of it. For thirteen years it has been cast out of their mints, for during this long period no full legal-tender silver coins have been issued in Europe. Only our republic, among nations is boldly plunging deeper and deeper into the dangers of silver coinage. When we have had the experience of older nations as to its operations, we may, and, I think, surely, will wish, like them, to retrace our steps when it is too late. So, you see, there is trouble wherever there is silver. What to do with their silver, which has fallen so low in value, is a serious problem in all these countries. It hangs like a dark cloud over their future.

So much has silver fallen in all parts of the world and disturbed everything that several conferences have been called by the nations in recent

years, to which the United States has sent delegates. The object of these was to see whether the chief commercial nations could not agree again upon a new gold value for silver. But the conclusion has always been that it was too dangerous to attempt to fix a new value for silver until it could be more clearly seen what the future was to show about its supply and value, for perhaps it might fall so low that 25 or 30 ozs. of it would not be worth more than an ounce of gold; no one can tell. As our country has already gone so far into the danger as to have \$482,000,000 in depreciated silver, we had to confer with our neighbors in misfortune, and appear as creditors have to appear at meetings held to try to support the bad business of a failing debtor.

Great Britain has not one dollar of silver held in reserve. France has no less than \$650,000,000 in silver in her bank; but every dollar of Britain's reserves is in the one steady, unchangeable basis—gold.

When they talk about fixing a gold value upon silver, she says that she really does not know what she will decide upon in the matter. What she is praying for is that the United States will continue to go deeper and deeper into silver until retreat is impossible, and she will keep her old policy, which has made her supreme in finance. Her only possible rival is not to be found in Europe, but here in the United States. What a grand thing for Britain if our country could be brought down to a silver basis—forced to relinquish the one standard which can alone give a nation front rank in the financial world! Silver for the republic, gold for the monarchy; this is what Great Britain is hoping may come to pass, and what every American should resolve never shall. Governments may pass what laws they please about silver; the world heeds them not. Every business transaction between nations continues to be based on gold exclusively—nothing but gold—and will so continue. Britain knows this and acts accordingly.

The first act which aimed to give by legislation a value to silver was passed in 1878. It required our government to buy at least two million ounces of silver every month, while all other governments had stopped coining it, because it had become dangerously erratic in value. The silver men insisted that these purchases would raise its value; but were they right? No. It did not advance in price. What was to be done then? "Ah!" said these silver-tongued speculators, "let the government buy four and a half million ounces per month, and this will take all that the country's mines yield, and more too, and so silver must advance in value."

The price did advance. Silver rose from 96 to 121, but it is back to 97. So, instead of being free from the silver trouble, as Britain is and we should have been, these men have succeeded in unloading upon the government already \$390,000,000 of their silver, and we are getting almost as badly off as France; but with this difference: France and other nations prudently stopped adding to their burdens of silver thirteen years ago, while our government is adding to its store four and one-half millions of ounces every month. The United States is trying to ignore the changed position of silver, and to make it equal to gold, against the judgment of all other first-class nations. To succeed, we shall have to buy not only what our own mines produce, but a great deal of what all other mines produce throughout the world, the total yield of silver being enough to make 168,000,000 of our silver dollars every year; and then we must, in addition, be prepared to buy the \$1,100,000,000 worth with which European governments are now loaded down, and which they are so anxious to sell.

So far from the government purchases of silver having raised its value, the government could not to-day sell the \$313,000,000 worth in its vaults without losing some millions upon the price it has paid the silver-owners for it. You will scarcely believe that the accounts of the treasury state that the government has made, so far, sixty-seven millions of profit upon its silver purchases. This is claimed because for the amount of silver put in a dollar it has paid only about eighty cents. All this "profit" is fictitious.

But while the disgrace is upon us, the financial evils of "debasement" coinage are yet to come; for, although the government issues debased coin, it agrees to receive it as worth a dollar in payment of duties and taxes, and makes it legal tender, and so it passes from hand to hand for the present as worth dollars. In this way the government has been able so far to prevent its depreciation. One thing is clear: ultimately the load must become too heavy, and, unless silver rises in value, or enough is put into the dollars to represent their value in gold, or the purchase of silver by the government is stopped, we must sooner or later fall from the gold basis to the condition of the Argentine and other South American republics.

Even in the mind of the most reckless there will be some doubt whether the United States alone can take the load of the world upon its shoulders and carry it, when all the other nations together are afraid to try it, and when no nation in the history of the world has ever succeeded in giving permanent value, as a standard for money, to a metal that did not in itself possess that value. Mark this: that our government has only succeeded so far in doing this with its silver dollars because it has issued only a limited quantity, and has been able to redeem them in gold.

Every nation has had eventually to recoin its "debased" coin or repudiate its obligations, and go through the perils and disgrace of loss of credit and position. In many instances the "debased" coin never was redeemed, the poor people who held it being compelled to stand the loss.

There is, however, one valuable feature of the present silver law which, if not changed, may stop the issue of many more "debased silver dollars." It requires that two millions of the four and a half millions of ounces of silver purchased each month shall be coined into money for one year. After that only such amounts are to be coined as are found necessary to redeem the silver notes issued. As people prefer the notes to the silver, little or no coinage of silver dollars will be necessary, and only silver notes will be issued. When the government ceases to coin silver dollars it will stand forth in its true character before the people—that of a huge speculator in silver, or, rather, as the tool of silver speculators, piling up in its vaults every month four and a half millions of ounces, not in the form of "money," but in bars. Surely this cannot fail to awaken the people to the true state of affairs, and cause them to demand that the reckless speculation shall cease.

It is in every respect much less dangerous, however, to keep the silver purchased in bullion than to coin it in "debased dollars," because it

renders it easier at some future day to begin the coinage of honest silver dollars—that is, coins containing the amount of silver metal that commands a dollar as metal; instead of 371 grains of silver, 450, or 460, or more or less, should be used. This is just about the amount the government gets for each dollar. No possible act of legislation that I know of would produce such lasting benefit to the masses of the people of this country. But beyond material benefit something much higher is involved—the honor of the republic. The stamp of its government should certify only that which is true.

I do not suppose that there are many men in the United States, except owners of silver, who would vote that silver take the place of gold as the standard of value. If the people understood that the question was whether the one metal or the other—silver or gold—should be elected as the standard, the vote would be almost unanimous for gold, its superiority is so manifest. Yet such is surely the issue, although the advocates of silver disclaim any intention to disturb the gold standard, saying they only desire to elevate silver and give it the position which gold has as money.

Suppose you get in change a five-dollar gold piece and five dollars in silver, and there is some doubt whether an act of Congress will really prove effective in keeping silver equal to gold in value forever; ninety-nine people out of a hundred may think that the law will give this permanent value to silver, which the article itself does not possess; but one man in a hundred may have doubts upon the subject. I think the more a man knows about "money," the more doubts he will have; and, although you may have no doubts, still the fact that I have doubts, for instance, will lead you to say: "Well, he may be right; it is possible I may be wrong. I guess I will give Smith this silver for my groceries to-morrow, and give the old lady this beautiful, bright golden piece to put by; it needs no acts of Congress—all the acts of Congress in the world cannot lessen its value; the metal in it is worth five dollars anywhere in the world, independent of the government stamp; these five pieces of silver are worth only three dollars and seventy-five cents as metal. Yes, I shall let Smith have the silver—gold is good enough for me."

And you may be sure Smith unloads the silver as soon as he can upon Jones. And many people will believe and act so, and the gold in the country will disappear from business, and silver alone will be seen and circulate; every man that gets it giving it to another as soon as he can, and so keeping it in active circulation; and every man that gets a bit of gold holding it, and thus keeping it out of circulation. So instead of having more money, if we go in for trying by law to force an artificial value upon silver in order to use it as money, we shall really soon have less money in circulation. The seven hundred millions of gold which is now in circulation, and which is the basis of everything, will speedily vanish, the vast structure of credit built upon it will be shaken, and the masses of the people compelled to receive silver dollars worth only 78 cents, instead of being, as now, redeemable in gold and always worth 100 cents. For, remember, as I have told you, 92 per cent. of all operations conducted by "money" depends upon people having absolute confidence in the "money" being of unchangeable value.

Issue one hundred dollars of "debased" coin more than all men are sure can be kept of unchangeable value with gold—panic and financial revolution are upon you. More "money," you see, which could only be used in 8% of our smallest financial transactions, can easily be so issued as to overwhelm all the important business of the country by shaking "confidence," upon which 92% rests. To be always free from danger is to issue only such "money" as in itself has all the value certified by the stamp upon it. So jealously does Britain, our only rival, adhere to this that she is spending two millions of dollars just now to recoin gold coins which have lost a few cents of their value by wear. Her government stamp must always tell the truth. The republic should not be less jealous of its honor.

As you have seen, the silver men were disappointed at the failure of acts of Congress to advance the value of their silver. Twice the government has been induced to do as they asked, under assurances that compliance would surely get the country out of its dangerous position as the owner of silver; twice it has been deceived. You would think the silver owners would now admit their error and help the government to get back to safe ground with as little loss as possible. Far from it; instead of this they have taken the boldest step of all, and urged upon Congress what you have heard a great deal about—the "free coinage of silver." Now, what does that mean? It means that our government is to be compelled by law to open its mints and take all the silver with which European governments are loaded down, and part of all the silver mined in the world, and give for every seventy-eight cents' worth of it one of these coins, which you are compelled to take as a full dollar for your labor or products. It means that the European merchant will send silver over here, get it coined at our mints or get a silver-dollar note for it, and then buy a full dollar's worth of your wheat or corn or anything he wants, for the silver he could get only seventy-eight cents for in Europe or anywhere else in the world. Europe is doing this every day just now with India, the Argentine Republic and other countries upon a silver basis. The British merchant buys wheat in India upon the depreciated silver basis, takes it to Europe and sells it upon the gold basis. He has thus to pay so little for Indian wheat that it has become a dangerous competitor to our own in Europe, which it could not be except that by the fall in silver the Indian farmer gets so little value for his products.

It is only a few months since the new Silver Bill was passed requiring the government to more than double its purchases, and already eight millions of dollars of silver more than we have exported have been sent into this country from abroad—something unknown for fifteen years, for we have always exported more silver than we have imported. Now we are buying all our own mines furnish, and being burdened with some from Europe, for which we should have received gold. In eighteen days of the month of April we have sent abroad nine millions of dollars in gold; so that under our present silver law you see Europe has already begun to send us her depreciated silver and rob us of our pure gold—a perilous exchange for our country and one which should fill our legislators with shame. Understand, please, that hitherto, under both bills compelling the Government to buy silver, bad as these were, yet the government has got the metal at the market price, now about 78 cents for 371½

grains; and only this amount the government has put into the so-called dollar. Under "free coinage" all this will change. The owner of the silver will then get the dollar for 78 cents' worth of silver. For pure, cool audacity I submit that this proposition beats the record; and yet when the Farmers' Alliance shouts for free coinage, this is exactly what it supports—a scheme to take from the people 22 cents upon each dollar and put it into the pockets of the owners of silver. Surely you will agree that if 78 cents' worth of silver is to be made a dollar by the government, then the government, and not the silver owner, should get the extra 22 cents' profit on each coin, if it succeeds. The government needs it all; for as I told you before, the silver bought by the government only at market value could not be sold to-day without a loss of millions.

If the free coinage of silver becomes law our farmers will find themselves just in the position of the Indian farmer; and yet we are told that they are in favor of silver. If this be true there can be only one reason for it—they do not understand their own interests. No class of our people is so deeply interested in the maintenance of the gold standard and the total sweeping-away of silver purchases and debased coinage as the farmer, for many of his products are sold in countries that are upon the gold basis. If the American farmer agrees to take silver in lieu of gold, he will enable the Liverpool merchant to buy upon the lower silver basis, at present 78 cents for the dollar; while for all the articles coming from abroad that the farmer buys he will have to pay upon the gold basis. He will thus have to sell cheap and buy dear. This is just what is troubling India and the South American republics. Prices for this season's crops promise to be higher than for years. See that you get these upon the gold basis.

Open our mints to the free coinage of silver, and thus offer every man in the world who has silver to sell a one-dollar coin stamped by the government, and taken by it for all dues, for which he only gives 37 1/4 grains of silver, worth 78 cents, and every silver mine in the world will be worked day and night and every pound of silver obtained hurried to our shores. The nations of Europe, with eleven hundred millions of depreciated silver already on hand, will promptly unload it upon us; they will demand gold from us for all that we buy from them, and thus rob us of our gold while we take their silver. With "free coinage" in sight, we shall fall from the gold to the silver basis before the bill is passed. The last words of the late lamented Secretary Windom will prove true:

"Probably before the swiftest ocean greyhound could land its silver cargo in New York, the last gold dollar within reach would be safely hidden in private boxes and in the vaults of safe deposit companies, to be brought out only by a high premium for exportation."

It is a dangerous sea upon which we have embarked. You should ask yourselves why you should endanger the gold basis for silver. Does any one assert that the silver basis would be better for you or for the country? Impossible. No one dares go so far as this. All that the wildest advocate of the change ventures to say is that he believes that silver could be made as good as gold. Everybody knows that nothing could be made better. Let us ask why any one but an owner of silver should wish silver to be made artificially anything else than it is intrinsically. What benefit to any one, except the owner of silver, that the metal silver should not remain where nature causes place it, like the metals copper and nickel? Why should it be credited with anything but its own merits? There was no prejudice in the mind of any one against it. It has had a fair race with gold; the field is always open for it, or for any metal, to prove itself better suited for the basis of value. If silver became more valuable in the market and steadier in value than gold, it would supplant gold. Why not give the position to the metal that wins in fair competition? Gold needs no bolstering by legislation; it speaks for itself. Every gold coin is worth just what it professes to be worth in any part of the world; no doubt about it; no possible loss; and what is equally important, no possible speculation; its value cannot be raised and cannot be depressed. The speculator, having no chance to gamble upon its ups and downs, does not favor it; but this is the very reason you should favor that which gives you absolute security of value all the time. Your interests and the interests of the speculator are not the same. Upon your losses he makes his gains.

One reason urged why silver should be purchased and coined is that the country has not enough "money," and that free coinage of silver will give it more. But if we need more "money," the only metal which it is wise to buy is gold. Why issue your notes for silver, which is falling in value and involves unknown dangers, when for these same notes you can get the solid, pure article itself, real money, gold, which cannot possibly entail a loss upon the country? But is it true that the country has not enough "money"?—that is, you remember, the coined article used for exchanging other articles. If so, it is a new discovery. We have not suffered for want of coined money in times past, and yet there is for each man, woman, and child five dollars more "money" in circulation than there ever was. We have more circulating medium—that is, "money"—per head than any country in Europe, with one exception, France, where the people do not use checks and drafts as much as other similar countries—a fact which makes necessary many times more coined money than we require. Still, there is little objection to having just as much coined money as is desired, provided it is not debased, but honest money; and the only way to be sure of that is to buy gold and coin it into "money"—not silver, the future value of which is so doubtful, and the purchases of which have so far been a losing speculation. Ask the advocate of more money why gold is not the best metal for the government to buy and coin into money for the people, and see what he has to say. Gold is as much an American product as silver; our mines furnish more than two millions of dollars of it every month. He could have no objection, except that this would not tend to keep up the price of his own product, silver. He could not deny that it would give safer money for the people.

There is another plea urged on behalf of silver. Many public men tell us that silver coinage "is in the air," that people want it because they think it will make money "cheap," and that, silver being less valuable than gold, the debts of people could be more easily paid. But let me call your attention to one point just here. The savings and the property of the people could only thus be reduced in value if the gold standard fell. As long as all government notes were kept equal to gold, as at present, no matter what amount of silver the government bought or coined, not the slightest change is possible. Only after the financial crisis had come, and

the gold standard had gone down in the wreck, and every dollar of gold was withdrawn and held for high premiums, could any change occur to favor one class or another. If any man is vaguely imagining that he is to save or make in some way by the government becoming involved in trouble with its debased silver coin and silver purchases, let him remember that, in order that this vain expectation can be realized, there must first come to his government a loss of ability to make good its determination to keep its silver dollar equal to gold, when gold would at once vanish and command a premium. A wise Secretary of the Treasury has truly foretold the result:

"This sudden retirement of \$600,000,000 of gold, with the accompanying panic, would cause contraction and commercial disaster unparalleled in human experience, and our country would at once step down to the silver basis, when there would no longer be any inducement for coinage, and silver dollars would sink to their bullion value."

The man who tries to bring about this disaster in the hope to profit by it is twin-brother to him who would wreck the express train for the chance of sharing its contents, or would drive the ship of State on the rocks for the chance of securing a part of the wrecked cargo. He is a wrecker and a speculator. His interests are opposed to the interests of the toiling masses.

Again, we are constantly told that the masses of the people favor "free silver coinage," or at least uphold the present silver laws, because they have received the impression, somehow or other, that the more silver there is coined the more money will come to them. Let us look into that. When the government buys silver bullion, it gives its own notes or silver dollars for it. Who gets these? The owners of the silver bullion. How can these be taken from their pockets and put into the pockets of the people? From what we know of the silver men, we cannot expect them to present many of their dollars to anybody; it will only be when they buy the labor or the products of the people that they will give these dollars at the value of a hundred cents, which have cost them only 78. Will they give more of these 78-cent dollars than they would have to give of 100-cent dollars for the same labor or products? No, not until or unless the effort of the government to give an artificial value to silver broke down, and our money lost value, when a dollar might not be worth half a dollar in purchasing power; calculated upon gold value, they would always give less value than before. How, then, can the working people or the farmers be benefited? It is the owners of the silver, who will give the government 78 cents' worth of bullion and get for it a dollar, who will make the profit. Surely this is clear. Up to this time the dollar which the farmer or workingman receives is still worth a dollar because the government has been able, by trying hard, to keep it worth this; but when "free coinage of silver" comes, the silver dollar must fall to its real value—78 cents—and the farmer and workingman will be defrauded; so that the interests of the farmer, mechanic, laborer, and all who receive wages are that the "money" they get should be of the highest value, and not cheap—gold, and not silver.

Up to this time we have held fast to gold as the standard. Everything in the United States is based upon gold to-day, all silver notes or coins being kept equal to gold. Has that been a wise or an unwise policy? Would it now be best to let the gold standard go, to which the advanced nations cling, and especially Britain, and adopt the silver standard of our South American neighbors? Upon the solid rock of gold as our basis—article we have built up the wealthiest country in the world, and the greatest agricultural, manufacturing, and mining and commercial country ever known. We have prospered beyond any nation the sun ever shone upon. In no country are wages of labor so high, or the masses of the people so well off. Shall we discard the gold basis, or even endanger it? This is the question before the people of the United States to-day.

I close with one word of advice to the people. Unless the government ceases to burden itself month by month with more silver, or if the free coinage of silver be seriously entertained, avoid silver; when you lay by anything, let it be in gold; when you deposit in the savings bank let it be a gold deposit; ask the bank to give you a gold receipt therefor. There is no use in the poor taking any risk. If you do not thus act promptly, you will find no gold left for you. The speculators and those closely identified with business will have it all. It is a fact full of warning that no bonds could be sold to advantage to-day which were not made specially payable in gold. There is danger ahead. Whatever happens, you can sleep soundly upon gold. Silver will bring bad dreams to wise men. Our government can do much; it is very strong; but there are two things which it cannot do: it cannot—by itself, against the world—permanently give to silver a higher value than it possesses throughout the world as metal, though this is what it is trying to do; and it cannot lessen the value of gold. Some day, perhaps, you may have reason to thank me for the advice I have given you, although I hope not.

Electrolytic Separation of Zinc.—Dr. Kosmann and Messrs. Th. Lange and Brieg, says the *Iron and Coal Trade Review*, have recently proposed a new electrolytic separation of zinc, capable of being applied on a large scale. Briefly, the process consists in the simultaneous preparation of metallic zinc and of solutions of sulphuric acid by electrolyzing solutions of the sulphite of zinc or other soluble salts of this metal in the presence of free sulphurous acid, the latter being employed either in the form of gas or as a liquid. The sulphurous acid, SO₂, is obtained on the large scale in the roasting of zinc blende. It is either kept in solution in water, or else used as soon as produced, being passed into the electrolytic bath. In the separation of zinc on the large scale by this process, the zinc-bearing mineral is partly roasted in the presence of some form of carbon or even an organic debris. It is then crushed and well mixed with water, either in a vat or revolving drum. The powdered mineral is kept in suspension in the liquid by constant agitation, and at the same time sulphurous acid gas, arising from the roasting of other zinc ore, is passed in; the result is the formation of sulphite of zinc. The liquid is now exposed to electrolysis, either in the same vessel or after removal to a more convenient receptacle, and while electrolytic action is going on, sulphuric acid gas is still passed in, so that all the oxygen that is produced during electrolysis becomes used up in the formation of sulphuric acid.

The following table embodies the data relating to the production of spelter and oxide of zinc :

STATES	Works.	PRODUCT.		ORE TREATED.		Men employed.	EXPENSES.		
		Spelter.	Zinc oxide.	Amount.	Value.		Wages.	(b) Supplies and materials.	Total.
Kas.	6	13,658	.....	41,995	1,178,662.73	541	\$311,150.50	\$48,500.00	\$409,515.50
Ill&W.	23	23,860	3,445	66,141	1,515,939.47	977	484,190.83	261,924.22	906,966.58
Mo.	3	11,077	351	20,580	727,503.33	445	237,062.62	81,187.53	382,081.15
Pa&NJ	4	7,075	13,174	53,617	590,738.45	495	281,475.13	210,344.00	569,433.74
Va&T.	3	3,190	.....	13,976	141,560.00	252	111,101.44	51,350.00	176,801.44
Total.	21	58,860	16,970	196,309	\$4,154,403.98	2,690	\$1,424,980.52	\$653,305.75	\$2,444,798.41

(a) Including 9,389 tons of sheet zinc. (b) Exclusive of ore.

The stocks of spelter in the United States January 1st, 1889, amounted to 2,781 tons; January 1st, 1890, 2,492 tons. The stock of zinc white January 1st, 1889, was 1,425 tons; January 1st, 1890, 1,261 tons.

Of the total capital invested in zinc works in the United States, \$613,000 was in land, \$2,019,914.77 in buildings and fixtures, \$975,856.50 in tools, implements, and machinery, and \$860,614.98 in cash, the total being \$469,886.25.

The amount of zinc used by galvanizers of iron sheets and wire and brass manufacturers in the United States in 1889 was about 50,000 tons.

THE MINERAL PRODUCTION OF ITALY IN 1889.

The total production of Italian mines in 1889, according to *Industries*, shows an increase of 38,240 tons over 1888, valued at about \$230,000, an increase of 2.13% in quantity and 2.19% in value. The production of 1888 compared with that of 1887 showed an increase of 1% in quantity and 4.6% in value. The increase in 1889, both as regards quantity and value, is mainly due, in order of importance, to the larger production of zinc ores, mercury, coals, lead ores, iron pyrites, asphaltum, and bitumen, antimony and auriferous ores. The decrease occurred mainly in sulphur, copper ores (only in value), silver ores, iron ores, salt, and boric acid. The following table shows the production of Italian mines in 1889 :

PRODUCTS.	No. mines worked.	Production.		No. men employed.
		Quantity. Tons.	Total value. Lire.*	
Iron ores.....	43	173,489	1,887,231	1,418
Manganese ores.....	5	2,203	51,801	46
Copper ores.....	16	48,214	1,341,528	1,300
Zinc ores.....	97	97,059	8,257,775	.....
Lead ores.....	102	36,894	7,062,348	10,587
Silver ores.....	1	1,997	1,748,663	.....
Gold ores.....	20	10,932	508,427	451
Antimony ores.....	5	563	100,072	328
Mercury (metal).....	9	385	2,274,450	533
Iron pyrites.....	4	17,022	246,494	343
Coals.....	37	390,320	2,858,154	2,714
Sulphur.....	419	371,494	24,652,376	29,028
Salt.....	19	28,490	556,633	635
Asphalt, bitumen and petroleum, also mineral waters.....	28	33,521	620,532	996
Aluminite.....	1	5,600	140,000	76
Boric acid.....	11	2,473	1,236,550	99
Graphite.....	7	1,531	10,271	27
Total.....	726	1,222,187	53,553,805	48,581

* One lire is equivalent to 193 cents.

The following table shows the production of metallurgical and chemical works in Italy in the year 1889 :

PRODUCTS.	No. of works.	Production.		No. of men employed.
		Quantity. Tons.	Total value. Lire.	
Pig Iron.....	11	13,473	2,123,096	227
Iron and steel.....	323	181,623	50,343,398	14,518
Gold.....	3	157,899	35,185,837	.....
Lead.....	3	212	569,848	89
Silver.....	1	18	6,176,100	700
Copper and its alloys.....	9	33	5,025,750	.....
Antimony.....	1	6,904	12,246,000	1,638
Mercury.....	1	1,969	280,066	44
Salts.....	3	378	2,274,450	43
Aluminite and sulphate of alumina.....	77	430,639	2,919,922	5,037
Refined sulphur.....	8	1,047	456,840	125
Patent fuel.....	17	53,316	4,958,586	269
Total.....	22	520,450	16,515,900	618
Total.....	475	1,370,961	139,074,963	23,308

The imports and exports of mineral substances during the year were as follows :

IMPORTS.		EXPORTS.	
Products.	Quantity (in tons).	Products.	Quantity (in tons).
Lead ores.....	2,421	Iron ores.....	183,281
Coal.....	3,992,117	Lead ores.....	7,439
Petroleum.....	71,331	Copper ores.....	9,034
Pig iron.....	191,082	Zinc ores.....	107,066
Iron and steel.....	309,245	Sulphur.....	331,902
Tin-plates.....	8,475	Salt.....	110,145
Copper and its alloys.....	6,340	Asphalt.....	4,825
Lead.....	.....	Boric acid.....	1,943
Alum and sulphate of alumina.....	1,487	Graphite.....	1,376
		Mercury.....	394

PERRY'S STEAM-ENGINE INDICATOR.

Considerable interest was excited at a recent *conversazione* of the Royal Society, in London, by a steam-engine indicator exhibited by Prof. John Perry, which was described as correct at the highest speeds. In the accompanying illustrations, Fig. 1 is a general view of the indicator, and Fig. 2 a section. The indicator, which is screwed into the

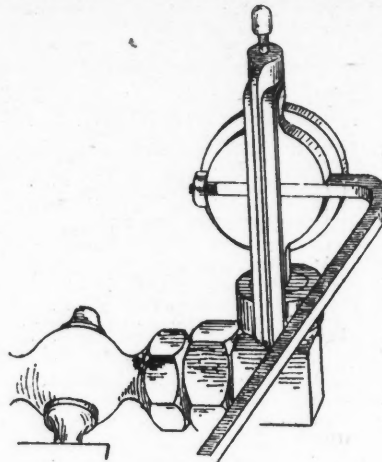


FIG. 1.

upper end of the cylinder, consists of a little box into which the steam enters and works against a small flexible diaphragm. A brass disk, actuated by this spring, carries a mirror about one-third inch in diameter; a beam of light from a lamp is projected onto this mirror, and the reflected beam is received upon a white screen, a photographic plate, or any other desired surface. Thus the motions of the disk are magnified and indicated by the reflection of a small beam of light from a mirror, as in the reflecting galvanometer. By

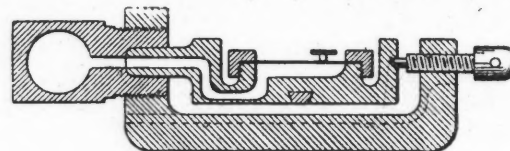


FIG. 2.

persistence of vision and the rapid motion of the disk an irregular and closed curved line, forming the well-known figure of an indicator diagram, is seen on the screen, which can be traced thereon by the observer with a piece of chalk if the work on the engine is steady, or it can be photographed. When photographing, the line thrown by a paraffine lamp is thicker than desirable, probably from halation; the weaker light of a common oil lamp is better. Professor Perry stated that he had used this indicator with an engine making 400 revolutions per minute, and that he had found it to give information never obtained before. He had seen the steam at its point of emission at a higher pressure than its initial pressure.

Survey of the Pacific Coast.—After 19 years the U. S. steamer *Hassler* has completed the survey of the California and Oregon coasts. The *Hassler* was built specially for this work in 1871, and on her maiden trip around Cape Horn, Professor Agassiz made a series of deep-sea dredgings along the coast of North and South America, with valuable results to science. The most interesting fact developed in the recent surveys is that the coast line of Southern California is more abrupt than that of any part of the Atlantic or other portion of the Pacific, thus, about Monterey, the 100-fathom point was reached within a mile or less of the shore, while in the Atlantic and South Pacific it is from 25 to 100 miles off shore.

Tests of Corrosion of Iron and Soft Bessemer Steel.—On March 16th, 1891, a piece of iron plate and a similar one of soft Bessemer steel, both clean and bright, says the *American Manufacturer*, were placed in a mixture of yellow loam and sand, with which had been thoroughly incorporated some carbonate of soda, nitrate of soda, chloride of ammonia, and chloride of magnesium. The earth, as prepared, was kept moist. F. H. Williams, chemist of the Riverside Iron Works, Wheeling, W. Va., reports that at the end of 33 days the pieces of metal were taken out, cleaned, and weighed. Results: Iron, loss by corrosion, 0.84%; steel, loss by corrosion, 0.72%. The pieces were replaced and left 28 days longer, or 61 days from beginning of test. Results: Iron, total loss by corrosion, 2.06%; steel, total loss by corrosion, 1.79%.

Coal Deposits in Westphalia.—During the annual meeting of the Society of Gas and Water Engineers, recently held in Strasburg, Herr Grassmann, mining assessor, of Saarbrück, read a paper on the production and consumption of Saar coal. He stated that the length of the district was 32½ miles, and its breadth 9½ miles. The richness in coal was estimated at 565,000,000 square metres, and the quantity of coal was reckoned at 14,000,000,000 tons. The yearly production was 6,000,000 tons, so that if the present rate only was maintained, the deposits would last over 2,000 years. Dr. Brookmann, of Bochum, then read a paper descriptive of the Rhenish-Westphalian coal deposits from a geological point of view. He said that 130,000 mines produced 36,000,000 tons of coal per annum in the Ruhr district. Although considerable beds lay in the ground, he was of opinion that they could not be worked at a greater depth than 1,000 metres, or say 3,250 ft., owing to the great danger. The thickness of the 138 layers in the Ruhr district was from ¼ to 2 metres, but in case of three strata they were about 3 metres.

THE BEETALOO DAM, SOUTH AUSTRALIA.

One of the largest concrete dams in the world was recently completed at Beetaloo, South Australia, having been constructed by the government of that colony to store water for irrigation purposes. It was commenced in 1888, and the work has been carried out mainly under the direction of Mr. A. B. Moncrieff, engineer-in-chief. The time of construction was two years six months. About 60,000 cu. yds. of cement concrete were required. The height of the weir is 110 ft., and the width on top is 14 ft. The length is 580 ft. The cross-section is in accordance with Professor Rankine's formula, the horizontal curvature having a radius of 1,414 ft. The cement used in its construction was imported from Europe, but the stone and sand were obtained in the neighborhood. To the western side of the dam there is a by-wash, with massive training walls, which are partly excavated in the rock on the hillside. The elevation, plan and cross-section of the dam are shown in the accompanying illustrations, for which we are indebted to the *Engineer*. The capacity of the reservoir made by the dam is about 800,000,000 gallons. The total amount expended in these irrigation works has been \$3,410,000, the dam itself having cost \$570,000.

PHYSICAL PROPERTIES OF SOME OF THE ALLOYS OF MANGANESE, COPPER, AND ALUMINUM.

Written for the Engineering and Mining Journal by Eugene H. Cowles.

The German silver industry of the United States is one amounting in value to upward of six or eight millions of dollars annually. Several thousands of people earn a livelihood pursuing it, and the beautiful goods and articles manufactured from this time-honored and valued alloy are everywhere visible. German silver enters largely into our street signs, harness and house hardware, and all manner of table ware, plated or in

new thing to bleach copper with manganese. Dr. Percy, the discoverer of aluminum bronze, was also the discoverer or inventor of manganese bronze. To him, and to him alone, is due the honor of having first made these two alloys.

Following his written description several other makers have from time to time within the past thirty years attempted to produce a pure manganese bronze, but unsuccessfully. Some have even attempted its introduction into the German silver trade. But thus far it has been both too expensive to manufacture and of too corrodible a nature, as then made, to admit of a prolonged use.

In order to overcome the two prime difficulties, that of casting and that of corrosion, we have introduced a small percentage of aluminum into the alloy, and with the happiest effect.

The successive steps that have been pursued are recorded on a list of upwards of two hundred distinct mixtures of the several metals, copper, zinc, tin, lead, aluminum, iron and manganese, and the metalloid silicon, with which experiments have been made to ascertain the tensile strength, ductility, color, etc. The most important determinations derived from this list of experiments appear to be about as follows: That pure metallic manganese exerts a bleaching effect upon copper more radical in its action even than nickel. In other words, we found that 18% of manganese present in copper produces as white a color in the resulting alloy as 25% of nickel would, this being the amount required to remove the last trace of red; that upwards of 20% or 25% of manganese may be added to copper without reducing its ductility, although it doubles its tensile strength and changes its color; that manganese, copper and zinc when melted together and poured into molds behave very similarly to the most "yeasty" German silver, producing an ingot which is a mass of blow holes, and which swells up above the mold before cooling; that the alloy of manganese and copper by itself is very easily oxidized; that the addition of 1% of aluminum to manganese copper alloy converts it from

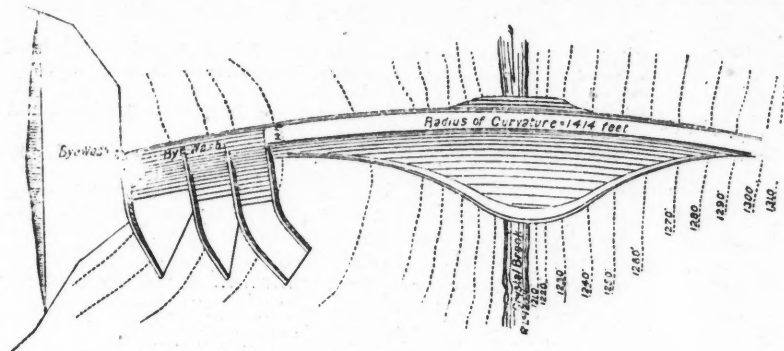


FIG. 1.—PLAN.

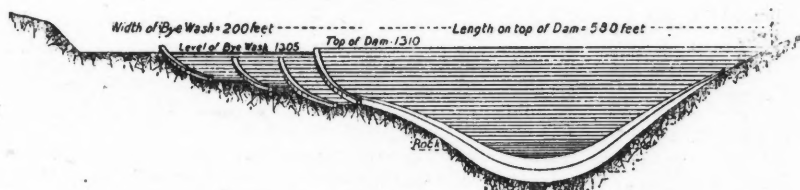


FIG. 2.—ELEVATION.

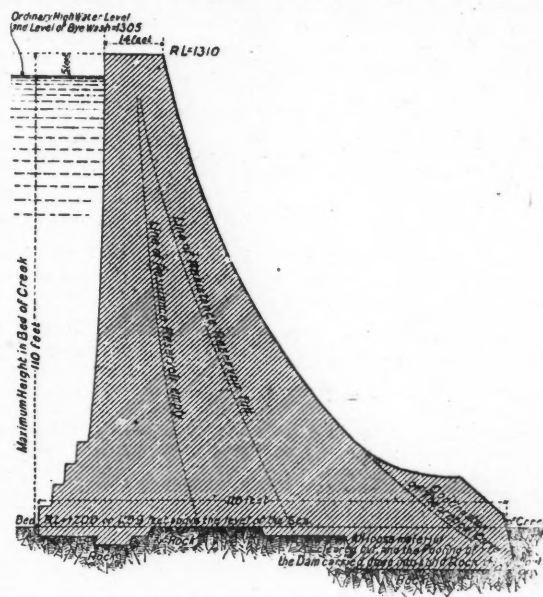


FIG. 3.—CROSS-SECTION.

THE BEETALOO DAM.

its native condition. There is scarcely an hour in the day that German or nickel silver is not before our eyes.

The composition of German silver is a very uncertain thing, and depends largely on the honesty of the manufacturer and the price one desires to pay for it. It is composed of copper, zinc and nickel in varying proportions. The best varieties contain from 18% to 25% of nickel and from 20% to 30% of zinc, the remainder being copper. The more expensive nickel-silver contains from 25% to 33% of nickel and from 75% to 66% of copper. The nickel is used as a whitening element; it also strengthens the alloy and renders the brass you might otherwise have without it harder and more non-corrodible; it likewise reduces the objectionable odor that emanates from brass, and which is so disagreeable if it occurs about the dining table.

Of all troublesome alloys to handle in the foundry or rolling mill German silver is the worst. It is unmanageable and refractory at every step in its transition from the crude elements into rods, sheets or wire. As a white-headed furnaceman recently said to the writer in one of our large mills, "you can put eight crucibles into the fire, each containing exactly the same mixture of German silver one day, and when you take them out and pour them into slabs for rolling, seven will be a mass of scum, or slag, or the stuff will swell like rising bread and overflow the molds and be so full of blow holes that it will look like a sponge. The eighth crucible will contain perfectly good metal. The bad stuff on remelting the next day will in nine chances of ten will come out just as good metal as the eighth pot the day before, and under apparently the same conditions."

With nickel at 70 cents or 80 cents per pound, German silver is necessarily an expensive metal, even in the ingot, and its extremely refractory nature makes it a still more luxurious one when fabricated into goods. With a view to obtain if possible a cheaper and better article than German silver, my brother, Alfred H. Cowles and myself began some years ago to experiment with the alloys of copper and manganese. We found that while a pure metallic manganese could with difficulty be reduced by the ordinary methods, it could be cheaply reduced in the electric furnace. Through a long course of experiments we have perfected a substitute for German silver which is offered to the public by the Cowles' Electric Smelting & Aluminum Company, under the name of "silver bronze."

The genesis of this alloy is somewhat interesting. Of course, it was no

one of the most refractory of metals in the casting process into a metal of the most superior casting qualities, and one whose non-corrodibility must in many instances be far greater than either German or nickel silver.

The "silver bronze" alloy which has been especially designed for rod, sheets and wire purposes is of the following composition: Manganese, 18%; aluminum, 1.20%; silicon, 5%; zinc, 13%; copper, 67.5%. It has a tensile strength of about 57,000 lbs. on small bars and 20% elongation. It has been rolled into thin plate and drawn into wire of .008 in diameter. Its electrical conductivity has not as yet been fully determined, but what tests have been made upon it show the same to be higher than German silver, and the hope is entertained that we have it in a material whose resistance will be such that it will afford the electrician better and cheaper wire for the rheostat than any other alloy.

Cement for Iron Castings.—The following cement for uniting iron castings is said to give good results: A mixture is composed of equal parts of sulphur and white lead, with about one-sixth portion of borax, the three being thoroughly incorporated together, so as to form one homogeneous mass. When the application is to be made of this composition, it is wet with strong sulphuric acid, and a thin layer of it is placed between the two pieces of iron, these being at once pressed together. In five days it will be perfectly dry, all traces of the cement having vanished, and the work having every appearance of welding.

Silver Fluoride.—M. Henri Moissan describes the preparation and properties of this substance in *Bulletin de la Societe Chimique de Paris*, 3. V. 7. He first prepares silver carbonate by precipitating pure silver nitrate in a dilute solution with solution of sodium bicarbonate. The precipitate is washed by decantation with abundance of distilled water. The thick deposit is placed in a platinum capsule, and hydrofluoric acid free from silver is added. The liquid is rapidly evaporated, at first over an open fire. When crystallization has commenced the capsule is placed on a sand-bath, and the mass is stirred with a spatula until it is completely dry. The black pulverulent residue dissolves easily in water. It is filtered; the solution is placed in a platinum capsule, and evaporated in a vacuum with exclusion of light over sulphuric acid. There is thus obtained a yellow mass, tough and elastic. Its fusion-point is 435. It reacts very energetically upon the non-metallic chlorides.

USEFUL COMPRESSED-AIR FORMULÆ.*

By William L. Saunders, C. E.

In the application of compressed air errors sometimes occur because there are no available rules and formulæ which apply to the subject. I have, therefore, prepared the following simple formulæ, which I have used in my experience.

RULE TO DESCRIBE THE ISOTHERMAL CURVE, OR TO FIND THE PRESSURE AT ANY POINT IN THE STROKE OF AN AIR COMPRESSOR DURING ISOTHERMAL COMPRESSION OR CONSTANT TEMPERATURE.

Mariotte's law: The pressure of any gas varies in the inverse ratio of the volume, the temperature remaining constant, or

$$(a) \quad P' = \frac{P}{V}$$

P' being the absolute pressure at any point of the stroke;

P the original absolute pressure;

V the volume corresponding to the required point of the stroke.

Required the pressure at one-half the stroke, compressing isothermally.

$$P' = \frac{15}{\frac{1}{2}} = 30 \text{ lbs. absolute} - 15 = 15 \text{ lbs. gauge pressure.}$$

Required the pressure at seven-eighths of the stroke.

$$P' = \frac{15}{\frac{7}{8}} = 120 \text{ lbs. absolute} - 15 = 105 \text{ lbs. gauge pressure.}$$

Required the pressure at one-quarter of the stroke.

$$P' = \frac{15}{\frac{1}{4}} = 20 \text{ lbs. absolute} - 15 = 5 \text{ lbs. pressure.}$$

Mariotte's law also applies in determining change of pressure in volumes of compressed air due to change of volume.

Given a volume of air, say 1 cu. ft., at a pressure of 30 lbs. on the gauge, what will be the pressure indicated if this air is forced into one-half the space?

$$(b) \quad P' = \frac{1 \times (30 + 15)}{\frac{1}{2}} = 90 \text{ lbs. absolute} - 15 = 75 \text{ lbs. gauge pressure.}$$

Reversing the problem: Given a volume of air, say 1 cu. ft., at a pressure of 75 lbs. on the gauge, what will be the pressure indicated if this air is expanded to 2 cu. ft.?

$$P' = \frac{1 \times (75 + 15)}{2} = 45 \text{ lbs. absolute} - 15 = 30 \text{ lbs. gauge pressure.}$$

Example. A receiver 3 ft. in diameter and 6 ft. long is filled with compressed air which indicates 60 lbs. on the gauge. What will be the pressure if this volume of air is inclosed in a receiver 4 ft. in diameter and 12 ft. long?

Volume of first receiver = $3^2 \times .7854 \times 6 = 42.4$ cu. ft.

Volume of second receiver = $4^2 \times .7854 \times 12 = 150.8$ cu. ft.

$$P' = \frac{42.4 \times (60 + 15)}{150.8} = 21.1 \text{ lbs. absolute} - 15 = 6.1 \text{ lbs. gauge pressure.}$$

The same rule applies in calculating volumes. In dealing practically with compressed air, we speak of pressure above the atmosphere, but in making calculations for volumes serious errors frequently occur because the atmospheric pressure (15 lbs.) is lost sight of.

For instance, a cubic foot of air represents about 15 lbs. absolute pressure, and if we wish to know what volume this cubic foot will occupy when it is subjected to a pressure (isothermally) of 60 lbs. per square inch above the atmosphere, we must figure thus:

$$(c) \quad V' = \frac{1 \times 15}{60 + 15} = 0.20 \text{ cu. ft.}$$

Given 1 cu. ft. of compressed air at 45 lbs. gauge pressure, what volume will this air occupy when subjected to a gauge pressure of 60 lbs.?

$$(d) \quad V' = \frac{1 \times (45 + 15)}{60 + 15} = 0.8 \text{ cu. ft.}$$

Free Air.—By free air is meant air at atmospheric pressure, which is about 15 lbs per square inch at sea level.

Given a volume, say 500 cu. ft., of free air, what volume will this air occupy when compressed (isothermally) to 60 lbs. gauge pressure?

$$V' = \frac{500 \times 15}{60 + 15} = 100 \text{ cu. ft.}$$

Reversing the problem, how much free air is represented by 100 cu. ft. of compressed air at 60 lbs. gauge pressure?

$$V' = \frac{100 \times (60 + 15)}{15} = 500 \text{ cu. ft.}$$

VOLUMES OF FREE AND COMPRESSED AIR FURNISHED BY AIR COMPRESSORS.

Example. The air cylinder of a compressor is 12 ins. in diam., stroke 18 ins. What volume of free air will it furnish (theoretical) when running at 120 revolutions per minute? 120 revolutions represents 360 ft. piston speed per minute.

$$12^2 \times .7854 = 113.1 \text{ area in square inches.}$$

$$\frac{113.1 \times 360}{144} = 282.7 \text{ cu. ft. free air.}$$

And by (c) $\frac{282.7 \times 15}{60 + 15} = 56.5$ cu. ft. of compressed air at 60 lbs. on gauge.

A rule by which volumes of compressed air may be approximately determined from volumes of free air, is to divide by the numbers of atmospheres.

For instance, 60 lbs. represents 5 atmospheres (absolute); 500 cu. ft. of free air, divided by 5, equals 100 cu. ft. of compressed air at 60 lbs. gauge pressure.

As pressures are not always given in even multiples of atmospheres, this rule serves only to determine approximate results.

REDUCED EFFICIENCY OF AIR COMPRESSORS AT DIFFERENT ALTITUDES.

The previous figures are based on the pressure of air at sea-level, or 15

lbs. (about) per square inch. As air compressors are frequently used at altitudes, it is desirable to know the extent to which an increased altitude affects the capacity of the compressor. Following are the barometric pressures at different altitudes:

Pressure at $\frac{1}{4}$ mile above sea-level.....	14.02 lbs. per sq. in.
" " $\frac{1}{2}$ " " " "	13.33 " " " "
" " $\frac{3}{4}$ " " " "	12.66 " " " "
" " 1 " " " "	12.02 " " " "
" " $1\frac{1}{4}$ " " " "	11.42 " " " "
" " $1\frac{1}{2}$ " " " "	10.88 " " " "
" " 2 " " " "	9.88 " " " "

Free air as applied to the volume of a compressor, or the space traversed by the piston, is not affected by change of altitude, but free air when applied to pressures either absolute or indicated, and to volumes of compressed air, is modified according to the density of the air at corresponding points.

Example. Required the volume in cubic feet of compressed air furnished by an air compressor when at work one mile above sea-level. Also, the volume in cubic feet of free air representing the reduced efficiency of the compressor when at work at this altitude.

Given an air compressor of the following dimensions: Diameter 12 ins., stroke, 18 ins., revolutions per minute 120.

We have seen by a previous example that this compressor furnishes 282.7 cu. ft. of free air (theoretical) at sea-level, and that this volume represents 56.5 cu. ft. of compressed air at 60 pounds on the gauge. If this compressor is used at an altitude of one mile above the sea, what volume of compressed air will it furnish at 60 lbs. on the gauge, the speed remaining the same?

Free air furnished by compressor 282.7 cubic feet.

Barometric pressure at altitudes of one mile, 12.02 lbs., then by (c) substituting the reduced barometric pressure we have

$$V' = \frac{282.7 \times 12.02}{60 + 12.02} = 47.18 \text{ cu. ft. at 60 lbs. on gauge.}$$

And if it is desired to know how many cubic feet of free air at sea-level are represented by 47.18 cu. ft. of compressed air at 60 lbs. we have by

$$(d) \quad V' = \frac{47.18 \times (60 + 15)}{15} = 235.9 \text{ cu. ft. of free air at sea-level, and}$$

282.7 - 235.9 = 46.8 cu. ft. of free air, representing the reduced efficiency of the compressor when used at altitude of one mile.

In practice, approximate determinations of the reduced efficiency of air compressors are made by deducting the percentage of difference between the barometric pressures at the respective altitudes.

The volume at sea-level being 1,

that at $\frac{1}{4}$ mile above sea-level will be.....	7% less.
" " $\frac{1}{2}$ " " " "	11% "
" " $\frac{3}{4}$ " " " "	16% "
" " 1 " " " "	20% "
" " $1\frac{1}{4}$ " " " "	24% "
" " $1\frac{1}{2}$ " " " "	28% "
" " 2 " " " "	34% "

Three rubies of unusual size were sold at auction in London recently. They were the property of the Burmah Ruby Mine Company, Limited. The first, weighing 1,185 carats, irregular in form and deep red in color sold for £400. The second, yellowish red in color, weighed 302 carats and sold for £65. The third weighed 281 carats, was dull red in color and brought £33 12s.

Native Fluorine.—M. Moissan has detected free native fluorine in the fluor-spar of the variegated vein that occurs in the syenite of Guinchay, near Lyons. He and M. Henri Becquerel have ascertained that the mineral on being crushed exhales a pronounced odor, something like that of chlorine, but more like that of fluorine. The gas thus disengaged displaces the iodine in iodide of potassium, so that starch is turned blue on contact with it; and it retains this property after the stone has been heated to 200° C.—a temperature at which ozone, to which the action might otherwise be attributed, is destroyed. It does not precipitate silver from its nitrate, as chlorine does. With water it forms a liquor which corrodes glass and attacks silicon at ordinary temperatures. It is fluorine occluded in the mineral.

The Population of British India.—According to the preliminary returns of the recent census operations in India, the population in British territory is 220,400,000, as against 198,655,600 in the former census (1881), an increase of nearly 22,000,000. The Feudatory States, omitting incomplete returns, which may be taken at about 90,000, have a population of 61,410,000, making a total of 281,900,000, as against 250,700,000 for the same areas at the last census. The returns give Bombay 806,000, Madras 449,000, Calcutta municipal area and port 674,000, and, including the suburbs Howrah and Bally, 969,000. At the last census the total for the same area was 847,000. Calcutta municipal area shows an increase of 92,000, and Howrah and Bally an increase of 24,000. The returns from Burmah show that the population of the whole country, excluding the Shan States, is 7,507,063, or 48.8 persons to the square mile. The population of Lower Burmah alone is 4,526,432, or an increase of about 790,000 since 1881.

"Staff" for World's Fair Buildings.—Thirty thousand tons, or two thousand carloads, of "staff" will be used in the construction of the main buildings of the Columbian Exposition. It has been decided that all of the buildings will be faced with this material. Staff was invented in France about 1876, and first used in the buildings of the Paris Exposition in 1878. It is composed chiefly of powdered gypsum, the other constituents being alumina, glycerine, and dextrine. These are mixed with water without heat, and cast in molds in any desired shape and allowed to harden. The natural color is a murky white, but other colors are produced by external washes rather than by additional ingredients. To prevent brittleness the material is cast around a coarse cloth, bagging, or oakum. The casts are shallow and about half an inch thick. They may be in any form—in imitation of cut stone, rock, faced stone, moldings, or the most delicate designs. For the lower portions of the walls the material is mixed with cement, which makes it hard. The material is impervious to water.

*From "Compressed Air Production," with additions by author.

ELECTRIC PERCUSSION DRILLS AT LAST CHANCE MINE, IDAHO.

Data concerning the economy of the electric percussion drills which are now being quite extensively introduced among the metal mines of the West are needed. The following, although incomplete, are of interest. At the Last Chance mine, Wardner, Idaho, two air drills required five cords of wood per 24 hours; while for running four electric percussion drills, manufactured by the Edison General Electric Co., of New York, it is stated that but one and one-half cords of wood were used, each electric drill doing more work than each air drill. In consequence of the greater efficiency the air drills have been replaced by electric drills at this mine. The compressed-air plant at the Last Chance was situated 1,000 ft. higher up the mountain-side than the electric plant, and a considerable saving in the cost of fuel per cord was thereby effected.

DUST FROM ROASTING FURNACES.

Written for the Engineering and Mining Journal by C. H. Aaron.

When powdered ore is roasted in a furnace, a part of it is carried out by the draught, the proportion varying with the character of the ore, the

The large proportion of dust accumulating in the chambers of the cylinder and stack furnaces, and which it was supposed (not quite correctly, as I shall show) could not be retained in the furnace long enough to be roasted, and which, when worked by itself, yielded a poor result, and when mixed with the mass of the ore reduced the percentage of solubility and therefore that of the extraction, led to the invention of means by which it might be properly roasted outside of the main furnace.

In the Stetefeldt furnace this is accomplished by an extra or "auxiliary" fire, through the flames of which the dust passes in the descending part of the flue, after which it drops into the dust hoppers in the horizontal flue, the smoke, etc., continuing on to the vertical chimney which creates the draught. Acting under a belief that this auxiliary fire, which gives excellent results in the Stetefeldt furnace, and which was patented, was the only feasible solution of the dust question, the patentees of various modifications of White's inclined cylinder furnace obtained permission to apply it to them, paying a royalty to the Stetefeldt Furnace Company for the privilege. I am not aware of the device having been adopted in connection with the furnaces of the Brückner class, probably because in their furnaces, which are charged and discharged periodically, the sensible dusting is not continuous, ceasing as soon as the charge reaches a certain stage of the roasting. In working with these furnaces the dust was usually passed to the pans from the chambers without further treatment.



EDISON ELECTRIC PERCUSSION DRILL, LAST CHANCE MINE, WARDNER, IDAHO.

degree of comminution, or fineness, the strength of the draught and the style of furnace used. The presence of minerals which decrepitate in the heat, such as calc-spar, and of those which both decrepitate and scintillate, such as blende and pyrite, increases the dusting. Other things being equal, the proportion is least in the reverberatory furnaces, and greatest in those which "shower" the ore through the current of heated air. All well-arranged roasting furnaces are therefore provided with "dust chambers" in which the greater part of the dust collects, while a more or less notable quantity remains in suspension in the air and is lost, any precious metal thus carried away being included in the so-called "loss by volatilization," though not, strictly speaking, volatilized. In the Brückner furnace I have found that about 15% of the ore passed into the chambers; in the Thompson-White inclined cylinder about the same, or rather more, and in the Stetefeldt it sometimes amounts to 30%.

This so-called dust is not all of extreme fineness; a considerable proportion of it is coarse enough to have resisted the force of the draught, but is carried over by the thick cloud of finer matter. It is usually of about the same assay value as the mass of the ore, sometimes it is richer. When it leaves the furnace it is generally about half roasted, or becomes so while lying in the chambers; hence means must be used to complete the roasting,

In 1876 I was using a Brückner furnace, and I found that from 10% to 15% of the ore lodged in the dust chambers. It was not well roasted, and I made an experiment which proved satisfactory. The dust was removed from the chambers periodically, piled on the paved floor, moistened slightly with a solution of salt and sulphate of iron, about two parts of the former to one of the latter, and recharged in the cylinder. The percentage of dusting from this dust was about the same as before, from 80% to 85% of it remaining in the cylinder until discharged, and giving an excellent result.

In 1889, in Honduras, I was roasting silver ore containing calcite, zinc-blende and galena, in a Thompson-White inclined cylinder furnace without the more recent improvements, but having an auxiliary fireplace for roasting the dust. Finding that the solubility assays of the dust from the first chamber, which was taken out daily, only gave about 40%, while the roasted ore had a solubility of from 80% to 88%, I investigated the cause. The auxiliary fireplace was inconvenient to get at, and the fire was consequently neglected by the (native) roasters. This matter of convenience should always be attended to in the construction of works. Convenience in working conduces to thoroughness. It was, moreover, evident that to maintain such a fire as would effectually roast the dust would consume far more wood, in proportion, than was used in the main fire place. In any case it was hopeless to think of getting the

native negroes to bother themselves much about that auxiliary fire, as these people are not good for attending to more than one thing at the time. I formed a heroic resolve: I bricked up the door of the auxiliary fireplace, and drilled a hole obliquely through the arch of the ore chamber, inserted a piece of iron pipe, luted the part which reached through the arch and adapted a hopper to the upper end of the pipe. I employed two boys, one to carry the dust from the chamber in a bucket, and one stationed on the top of the ore chamber (a nice warm place) to pour the dust into the hopper, whence it passed through the pipe to the interior of the chamber, joining the roasted ore as that fell from the cylinder, with which it was mixed from time to time by the attendant with a hoe. I intended to have the dust shoot a little way into the cylinder, but my pipe was not long enough. The arrangement answered very well until the pipe was burned off and stopped up.

My object was to test one of the recent improvements in the Thompson-White furnace, consisting in a metallic elevator which takes the dust constantly from the chamber and feeds it into the ore chamber in a small, steady stream. To prevent the dust falling in a compact stream as mine did, a small blast of air or steam, issuing from a flattened nozzle, is used to disperse it; mixing by the hoe is thus unnecessary.

In the Fulton-White furnace there is a similar elevator, but it returns the dust to the upper end of the inclined cylinder from which it has just issued. This arrangement seems inferior to the other, yet it may be preferable to the auxiliary fire, an opinion which I base on the following facts.

When my pipe burned off I adopted another plan. The screw feeder of the furnace would not pass the ore in. Perhaps it was owing to the calcite in the ore, and to the want of coarser screens for the battery, which I could not obtain, that the ore had a floury, clotting character, and such a high angle of stability that it would not only stand straight up, but, like Paddy's maypole, would even lean over the other way. Hence the screw simply made a tunnel through the mass, and then ceased feeding. This might have been overcome by a juggler, but, in addition, the screw would choke and stick. For those reasons I had already turned the stream of ore from the elevator directly into the furnace. The screw would feed concentrates or flue-dust perfectly, and every time the flues were cleaned I stopped the battery for a few hours, and passed the dust into the furnace. Somewhat to my surprise, and much to my gratification, it went through very well and came out at the other end well roasted. So I say, no more auxiliary fires, with this class of furnace, for me.

PRODUCTION OF ALUMINUM IN THE UNITED STATES.*

By E. L. Packard.

The Cowles process, now carried on by the Cowles Electric Smeltin & Aluminum Company at Lockport, N. Y., which was the pioneer electro-metallurgical processes for the reduction of aluminum, was established in 1885. Since that time its production has been as follows: aluminum bronze—1885, 4,000 to 5,000 lbs., valued at \$1,600 to \$2,000; 1886, 50,000 lbs., valued at \$20,000; 1887, 144,764 lbs., valued at \$57,000. Ferro-aluminum (containing from 5% to 10% aluminum)—1886, 2,000 to 3,000 lbs., valued at from \$780 to \$1,170; 1887, 42,617 lbs., valued at \$16,621. The total aluminum alloys produced by this company in 1889 was 171,759 lbs. The production of aluminum by the Pittsburg Reduction Company in 1889 was 19,200 lbs., which was sold at \$3 per lb. in quantity. The total production of aluminum in the United States in 1889, including that contained in alloys, was 47,468 lbs., valued at \$97,335.

The imports of aluminum into the United States are given in the following table:

Years. ^b	Quantity lbs.	Value.	Years. ^b	Quantity lbs.	Value.
1870.....		\$98.00	1880.....	34075	4,042.0
1871.....		341.00	1881.....	51710	6,071.0
1872.....			1882.....	56650	6,495.0
1873.....	2200	2.00	1883.....	42625	5,079.0
1874.....	68300	2,125.00	1884.....	59500	8,416.0
1875.....	43400	1,355.00	1885.....	43900	4,736.0
1876.....	13900	1,412.00	1886.....	45210	5,369.0 ^a
1877.....	13100	1,551.00	1887.....	1,26000	12,119.00
1878.....	25100	2,978.00	1888.....	1,34853	14,086.00
1879.....	28444	3,423.00	1889.....	99883	6,688.07

(a) Probably alloys. (b) Fiscal years ending June 30 to 1886; calendar years subsequently.

France was the only country which produced aluminum commercially until a few years ago. It had never been seen in any quantity until the Paris exposition of 1855, where it was shown in ingots and in the form of manufactured articles of various kinds. Among ornamental articles it was noticed that a small body of the imperial guard wore breastplates of aluminum. The price of the metal was then 2,000 francs a kilo. The production was as follows: 1863, 1 ton; 1867, 1.7 tons; 1872, 1.8 tons. Later statistics give the aluminum product of France as follows: 1886, 2,430 kilos, valued at 243,000 francs; 1887, 2,040 kilos, valued at 204,200 francs; 1888, 2,955 kilos, valued at 295,500 francs. Allowing the French production to have been 1.5 tons a year from 1860 to 1880 and 2.5 tons from that date to 1889, inclusive, we should have $31.5 + 22.5 = 54$ tons, or about 60 short tons, in the 30 years.

The production of aluminum in England in 1888 was 5,000 lbs., valued at £5,000; in 1889, 12,000 lbs., valued at £6,000. There was an English manufacture of aluminum from about 1860 to 1874, but no statistics of its production are obtainable. It could not have been very considerable, as the price of the metal was then very high. The Castner process was inaugurated in England in 1888. Supposing 5,000 lbs. per annum to represent the English production from 1883, when the Webster process was put in operation, to 1888, we have 30,000 lbs. which, with the 12,000 lbs. for 1889, equalling 42,000 lbs., or 21 tons, may be regarded as the English production up to the beginning of 1890. The French and English production would therefore amount to about 82 tons. The Aluminum and Magnesium Fabrik, at Hemelingen, near Bremen, has been in operation since

*From Census Bulletin No. 79.

the latter part of 1887, and has supplied all the aluminum produced in Germany. The production of this company is given as follows: 1887, 1,700 kilos; 1888, 8,400 kilos; 1889, 9,500 kilos; total, 19,600 kilos.

Adding this total to the figures representing the sum of the French, English and the American production from all sources, exclusive of alloys, which is nearly 94 short tons, we get in round numbers, 116 short tons, which therefore represents the total production of aluminum from 1860 to 1889, inclusive.

Liability for Manner of Loading Cars—Lanterns Furnished by Company.—An employé, while passing in the course of his duty over a car loaded with ore, stepped upon a piece of the ore, which turned under his foot, whereby he was precipitated from the car and severely injured. This is evidence of injury by accident rather than by any fault or negligence of the company. That the car was loaded by heaping up the ore at each end, leaving a depression in the middle, affords no suggestion of unusual or improper loading. That the company furnished its employé with a lamp which became extinguished while making a signal with it in the usual way, raises no presumption that the company was negligent, as it appears that the care of the lamp was left to him.—*East Tennessee, V. & G. Ry. Co. v. Suddeth, Supreme Court of Georgia, 12 S. E. Rep., 682.*

Labeling Chemical Glassware.—It is frequently desirable to attach a label to beakers and other vessels employed in analytical work, and gummed blank paper labels are often so used, but with some disadvantages. A very satisfactory substitute is obtained, says Mr. F. P. Dunnington, of the University of Virginia, in the *Journal of Analytical and Applied Chemistry*, by "grinding" a portion of the surface of the glass in the following manner: An old knife-blade or spatula is wetted with a solution of sodium hydrate and dipped into ordinary emery flour; this is rubbed upon the convex surface of the glass, so as to roughen a patch about one-half inch square. Upon such patch one can mark with a pencil, and when washing the vessel such marks are readily removed. After a little practice one may easily so put ground patches upon a nest of six beakers in ten minutes.

Determination of Sulphur in Coal and Coke.—A new process of determining the amount of sulphur in coal or coke has been devised by Mr. W. T. Neilson, chemist to the Distington Ironworks, near Whitehaven, says the *Iron and Coal Trades Review*. It is as follows: Mix 1 gram of coke with 2 grams of Na_2CO_3 and 0.5 gram of MnCO_3 , and place the whole in a flat platinum dish kept at a low red heat (allowing only the bottom of the dish to be red) for one hour. After this time all the sulphur and carbon will have been oxidized. The mixture is now fused, then cooled, and placed in a beaker with water, or in a basin, and 20 c. c. of hydrochloric acid added. Remove the platinum dish, and evaporate to dryness, and take up with 5 c. c. of hydrochloric acid and water; then filter and precipitate with BaCl_2 in the usual manner. It is not necessary to evaporate to dryness, but it is safer to do so. Testing a sample of hard Durham coke in this way Mr. Neilson found it to contain an average of 0.77 of sulphur, which was higher than that given by other methods. It is necessary in this process to make a blank experiment, which should be performed for the same length of time, and, if possible, at the same time when the experiment is made in a muffle furnace.

A New Use for Waste Glass.—A new use has been found for waste glass by Messrs. Rostaing, Garchey & Geille, of Paris, says the *American Manufacturer*. Any fragments of broken glass of various colors are mixed together, after having been broken to a suitable size; they are then placed in molds lined with silica, talc, or some other resisting material, and fired. A coherent mass is produced which can be dressed and cut into blocks, which are, of course, irregularly colored. Such blocks may be used as artificial marble. The blocks are usually rough on one side, owing perhaps to incomplete fusion; this gives a surface which is admirably adapted for causing them, especially if they are slab-like in form, to adhere to walls with the addition of a little mortar. Fine decorative effects can thus be produced. Designs in relief can be obtained by pressure while the block or slab is still plastic. If a suitable mold be prepared with movable partitions, then pieces of glass can be arranged in such a way that, upon firing, a very effective "stained glass" window is produced, the necessity of using "leading," as in the ordinary way, being thus obviated. This idea will enable many manufacturers, who have heaps of "waste" glass lying about useless, to turn them with very little expenditure to profitable account.

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, JULY 7th, 1891.	
455,318.	Steam Boiler. Ulysses G. Graham, Nyack, N. Y., Assignor of one-half to Lancelot Copleston, same place.
455,328.	Coal Piler. Gilbert J. Herbert, East Orange, N. J.
455,332.	Blast Cartridge. Joseph A. Hunt, Searcy, Ark.
455,336.	Metal-Rolling Machine. Samuel Johnston, Denver, Colo.
455,359.	Apparatus for Forcing Air. Henry S. Robinson, Andover, Mass.
455,396.	Rock Drill. Henry S. Grace, San Francisco, Cal., Assignor to Jacob A. Fischer, same place.
455,420.	Method of Electric Welding. Elihu Thompson, Swampscott, Mass., Assignor to the Thompson Electric Welding Company, Maine
455,498.	Gold Saver and Concentrator. William A. Woods, Santa Cruz, Cal., Assignor, by direct and mesne assignments, to the Pacific Coast Gold Saving Company, of California.
455,513.	Mining Machine. James J. Lytle, William F. Evans and Charles K'amber, What Cheer, Iowa.
455,531.	Ore Separator. Edward G. Good and James Thorne, Portland, Ore., Assignors of one-third to Ezra Rust, Saginaw, Mich.
455,601.	Separator for Coal or other Substances. George W. Parker, Terro Haute, Ind.
455,616.	Tide and Water Power. George C. Hale and Thomas E. Tinsley, Kansas City, Mo.
455,638.	Apparatus for Separating Asbestos from Crushed Rock. Henry Powers, Cranbourne, Canada.
455,650.	Crane. Henry Aiken, Pittsburg, Pa.
455,654.	Ore Washer. James O. Campbell, Colton, Utah.
455,677.	Crushing Mill. Joseph H. Yeaton, Coronado Beach, Cal., Assignor of one-half to John Campbell, same place.
455,684.	Coke Oven. Wilhelm Fritsch Zaborze, Germany.
455,698.	Steam Boiler and Furnace. George A. Ayer, Worcester, Mass., Assignor to the Complete Combustion Company, Portland, Mo.

PERSONALS.

Capt. Thomas Ball, of Stambaugh, Mich., has been appointed Mine Inspector of Iron County, Mich., to succeed Capt. John Morrison.

Mr. J. A. K. Stevens, editor of the Bartow, Fla., *Courier-Informant*, has been appointed Phosphate Inspector of the State of Florida.

Mr. W. A. Tbacher, mining and mechanical engineer, has resigned his position as manager of the N. O. and Puraren Mining Works of Honduras.

Mr. J. H. Burfield, Mining Engineer, formerly of Alaska, has returned from Europe, and passed through this city this week on his way to Utah.

Mr. Charles F. Stowell, who has been investigating the strain on the railway bridges of the State of New York, has published a large volume on the subject.

Mr. H. B. C. Nitz, E. M., geologist in charge of coal and iron of the Geological Survey of North Carolina, is at present engaged in examining and locating the iron-ore deposits of Ashe County, N. C.

Mr. Wm. Searle has resigned his position as mining captain with the St. Louis Ore and Steel Company, Pilot Knob, Mo., and has accepted a position with the Glen-Mohawk Mining Company, of Breckinridge, Colo.

The Summer School of Practical Mining of the School of Mines, Washington University, is located this year at Iron Mountain, Mich., where, under Prof. H. A. Wheeler, it is studying the famous Chapin iron mine. Later in the season the school will visit the Lake Superior copper region.

Mr. C. G. Munroe, superintendent of the Blue Bird Mining Company's Mill, Butte, Mont., and Mr. C. H. Bartlett, assistant superintendent, have resigned, owing, it is stated, to some misunderstanding with the managers of the company.

The new University of Chicago, Ill., which will owe its existence mainly to the endowment of John D. Rockefeller, is to have a model scientific school in connection with it. The late William B. Ogden, a Chicago pioneer, left a part of his fortune for educational purposes, and the trustees of the estate have decided to give 20% of the fund, about half a million dollars, for the establishment of this school. The matter is now under advisement in the courts of New York.

Mr. Frank L. Nason, late assistant geologist of the New Jersey Geological Survey, has been appointed to the position of assistant geologist on the Geological Survey of Missouri, and will be in charge of the examination of the iron ores of the State. Other assignments for the summer work of the latter survey are as follows: Prof. Erasmus Haworth has resumed work on the crystalline rocks and will also collect material for the preparation of a report on the mineralogy and petrography of the State. Prof. C. H. Gordon has similarly resumed work in the coal fields, and most of his time will be given to the detailed study and mapping of the coal beds of Macon County. Prof. J. E. Todd, of Tabor, Ia., has been engaged to take up the study of the quarternary deposits of the State and to prepare a report thereon.

Sir F. A. Abel, K. C. B., D. C. L., F. R. S., one of the most distinguished English scientists, who enjoys the honor of being at the same time president of the British Association and of the Iron and Steel Institute, past president of the Institute of Chemistry, the Society of Chemical Industry, and the Society of Telegraph Engineers and Electricians, retired into private life at the end of last month after a period of thirty-five years' service. He has during the greater part of that time been chemist to Woolwich Arsenal and chemical referee to the government. He became associate member of the Ordnance Committee in 1867, and has been president of the Committee on Explosives for the last three years. The Albert medal of the Society of Arts for the present year has been awarded by the council to Sir Frederick "in recognition of the manner in which he has promoted several important classes of the arts and manufactures by the application of chemical sciences, and especially by his researches in the manufacture of iron and of steel, and also in acknowledgment of the great service he has rendered to the state in the provision of improved war material and as chemist to the War Department.

OBITUARY.

Robert E. Reeve, a mining operator of Washington, died at Seattle, on the 22d inst. He owned extensive mining properties in the Northwest.

James G. Dimond, well known in the iron trade, in which he was engaged for about forty years, died in this city on the 5th inst., aged 57 years.

Capt. Solomon Howes, ex-commodore of the Merchants' and Miners' Transportation Company, died in Cambridge, Mass., on the 4th inst., aged 67 years.

Charles St. John, of Port Jervis, N. Y., died on the 6th inst., aged 73 years. He was one of the

founders of the national bank of which he was for many years and at the time of his death president, and was also one of the original incorporators of the Barrett bridge spanning the Delaware River and also of the Port Jervis Water Works Company.

Louis Haynald, the distinguished Hungarian prelate, scientist and statesman, died on the 6th inst., in the seventy-fifth year of his age. Mgr. Haynald engaged in frequent scientific expeditions in association with the chief botanists in Europe. He collected a botanical library accounted among the richest of Europe. He assisted many young men in beginning their scientific careers, and founded at the capital of his diocese a gymnasium and an observatory in 1877.

Alberto Edwards, the famous Chilean millionaire and copper king, died recently after several weeks of suffering caused by the ruthless treatment of President Balmaceda, who seized his property and sent him into exile. The Edwards copper works at Coquimbo, Chili, were established by Augustin Edwards, father of the deceased, who died about 20 years ago. The works are among the most important of Chili, and the Edwards brand of copper has always ranked superior to any other produced in that country.

John B. Packer died at Sunbury, Penn., on the 7th inst., aged 67 years. At the age of 15 years he was employed as an engineer on the survey of the Wicomico canal, and afterward on the State's exploration of the route between Harrisburg and Pittsburg, on which was afterward constructed the Pennsylvania Railroad. While a member of the Pennsylvania Legislature, from 1840 to 1850, Mr. Packer succeeded in having passed a bill incorporating the Susquehanna (now Northern Central) Railway Company, and it was largely through his instrumentality that the road was built.

Hugh L. Davis, one of the pioneer slate operators in the Lehigh region, Pa., died this week. He was born in Wales in 1816 and when 25 years of age emigrated to America. Over 40 years ago he settled at Slatington, and was connected with one of the early slate quarries at that place. Later he engaged in coal mining at Summit Hill, Carbon County, and subsequently he became a stockholder in the Connellsville Coke and Iron Company. Twenty-five years ago he removed to Slatington and once more engaged largely in the slate business, being one of the leading operators there and at Pen Argyll, in Northampton County.

INDUSTRIAL NOTES.

The American Tube and Iron Company, of Middletown, Pa., has received an order for the Matheson joint pipe from the Sandwich Islands.

Three hundred men employed at the Niedringhaus rolling mill, at St. Louis, Mo., struck on Tuesday because Mr. Niedringhaus refused to agree to a new schedule of prices.

Messrs. Lovegrove & Co., of Philadelphia, Pa., have been appointed selling agents for eastern Pennsylvania of the Keystone motor, manufactured by the Keystone Electric Company, of Erie, Pa.

The Muskegon Car Works, of Muskegon, Mich., which have been closed for two months, are about to be reopened. The creditors have decided to capitalize the debts, amounting to about \$130,000, and reorganize on the basis of \$250,000. A rolling mill is connected with the works.

The Bethlehem Iron Company, of Bethlehem, Pa., has been awarded the contract for making the steel forgings for the Haskell multicharge gun and the Reading Iron Company the contract for finishing the gun. The amount appropriated for the manufacture of this gun is \$55,000.

The New York State factory inspectors have just finished their work in this city and are well satisfied with the results. There is a closer conformity each year to the terms of the law, yet many changes are made necessary in the arrangement of stairways, elevators and ventilation.

Messrs. Heerdegen & Schnee report that they have so far located with the Heerdegen water indicator 20 wells, from 40 ft. to 900 ft. in depth, from which a flow of water aggregating 2,376,000 gallons per day has been obtained. Twenty-two wells are now being sunk, while surveys have been made for 27 others.

The Marquette City and Presque Isle Railway Company, which is operating the Thomson-Houston system, has recently been put in operation. This line comprises three miles of track and is at present operating three motor cars. This is the first road in Michigan equipped by the Thomson-Houston Electric Company.

The Multiple Speed and Traction Company, is to be authorized to construct at once a short experimental line of this system in Jackson Park, at Chicago, Ill., with a view, it is stated, of testing its merits for the rapid transportation of large crowds. The officers of the company are: A. P. Gilmore, president; O. Chanute and J. L. Silsbee, vice-presidents; M. E. Schmidt, secretary and general manager, and F. W. Gookin, treasurer.

The tug "Edwin D. Hartley," which is equipped with the new aqua ammonia engine of the Campbell

Engine Company, made a successful trial trip down the bay on the 8th inst., carrying a small party of engineers and others interested. The boat was constructed for the Inland Marine Company, which has acquired certain rights from the Campbell Engine Company. Mr. John White, the well-known coal man, Mr. James McLain, F. W. Clarke, and others of New York are interested in the new enterprise.

The directors of the reorganized Columbia Iron and Steel Company, composed of Uniontown and Pittsburg, Pa., capitalists, have effected a compromise with the creditors, all of whom have signed the extension. The following Executive Committee has been appointed by the new company to manage the mill: Robert Hogsett and James A. Searight, of Uniontown, and Mr. Neal, of Neal Brothers, the Pittsburg iron brokers. There is plenty of material in the yard at the mill to start upon, and as soon as the legal complications over the appointment of an assignee and receiver are arranged the new company will begin operations. Mr. E. M. Butz has been appointed general manager.

The Winona Bridge, across the Mississippi River at Winona, Minn., is completed. It will be used jointly by the Chicago, Burlington & Northern, Green Bay, Winona & St. Paul, and Winona & Southwestern railways. The bridge proper is 1,260 feet long, with approaches 270 and 1,100 feet long on trestlework. It is a modified Pratt truss of steel and iron, with curved top chord, with two spans of 240 feet, one of 360 feet and a draw span of 420 feet. The piers are of masonry on piles. The width between centers of trusses is 20 feet on the draw span and 360-foot span and 17 feet on the 240-foot spans. The bridge was built by the Union Bridge Company, of Athens, Pa. It was commenced August 1st, 1890, and the estimated cost was \$440,000.

The American Flint Glass Workers' Association is in session at Steubenville, O. The most important question which will be presented for action will be the scale of wages. A number of prescription blowers are clamoring for an advance. The more conservative members hold that an advance will bring about a conflict between manufacturers and blowers. The committee is asked to advance prices on lettered ware 10%; ball neck panels and plain flasks, 5%; lettered flasks, 15%; all wide mouths, from 7 to 16 ozs. inclusive, 2 cents per gross, and from 17 to 32 ozs. inclusive, 4 cents per gross; seal cordial and seal brandies, 15% above regular brandy prices, and all French round prescriptions and Baltimore ovals to Chicago oval prices.

The Ingersoll-Sergeant Drill Co., New York, informs us that the new bar-channeller at the Diamond slate quarry, Pen Argyll, Pa., was started last week. The company has attached a counter-balance to the machine, using where the rock runs very slant, and it is now cutting an average of 65 ft. per day, with the rock dipping about 30°. The bar channeller, which was recently sold to the Bangor Union Slate Company, at Bangor, cuts about 90 ft. per day, and W. E. Lloyd, of the Bangor Union Company, speaks in the highest terms of the machine. Before the latter put in the bar-channeller it made 2,500 squares per month; with this it now produces 3,000 squares, and at a saving of 25 cents per square, or \$750 per month. Orders for machines have been placed at the Northampton, Star and Standard quarries at Bangor, Pa.

The Norristown Steel Company, of Norristown, Pa., expects to start its plant about July 15th. The plant contains seven acres of land situated between the Pennsylvania and Reading Railroads just outside of the town limits of Norristown. The steel casting building is 90 ft. x 160 ft., contains two modern 15-ton open-hearth furnaces with a weekly capacity of 500 tons, and also a 3-ton cupola furnace. This building is equipped with a 3-ton overhead crane furnished by the Morgan Engineering Company, of Alliance, O. The boiler, pump and gas house, which is 136 ft. x 49 ft., contains four boilers, aggregating 1,500 H. P., and six gas producers. The power is furnished by a 150 H. P. engine, built by the Buckeye Engine Company, of Salem, O. In addition to present buildings, the company intends at an early date to erect a rolling-mill for blooms, billets, etc.; the principal business of the company, however, will be steel castings of all descriptions from open-hearth steel.

The H. W. Johns Manufacturing Company and the Chalmers-Spence Company, New York; the Asbestos Packing Company and Chas. W. Trainer & Co., Boston, and the Shields & Brown Company, of Chicago—the five largest asbestos manufacturers in the United States—have formed a corporation under the name of the H. W. Johns Manufacturing Company. The officers are: H. W. Johns, president; R. H. Martin, vice-president; C. H. Patrick, treasurer, and G. P. Erhard, secretary. The H. W. Johns Manufacturing Company was the name chosen for the new corporation because the old company of that name was the pioneer in the business and had the largest factory. H. W. Johns began the manufacture of asbestos goods in 1853. New works will be erected at Brooklyn. The new company will also be sole agent for the sale of vulcabeston, which is used largely for electrical purposes. The major supply of asbestos comes

from Canada, where the new corporation has extensive mining interests, and will have its headquarters in Maiden lane, New York City, with branch offices in Boston, Chicago and Philadelphia, and agencies in London and elsewhere abroad.

SOUTHERN INDUSTRIAL NOTES.

(From our Special Correspondent.)

The stockholders of the Anniston Pipe Works, of Anniston, Ala., recently held a meeting and ratified the lease made by Receiver Crafts to the Radford Pipe Works Company. The lease is for five years.

The New Birmingham Pipe Works has been organized at New Birmingham, Texas, with a capital stock of \$150,000. The plant is located near the Tassie Belle furnace. The charter has been secured and work on the foundations commenced. The daily output will be 25 tons, which will be increased at discretion of the management. The officers are: George F. Dalton, president; Allan Arthur, secretary and treasurer, and Leopold Wallach, Richard L. Coleman, T. J. Goree, directors.

The United States Rolling Mill Stock Company, of Anniston, Ala., has been reorganized, and work will be resumed at once. The papers pertaining to the reorganization forwarded from London called for an assessment of \$10 on each share of stock held, which were agreed to and signed by a sufficient number of stockholders. The capital stock is raised from \$3,000,000 to \$8,250,000, and securities will be issued as follows: 5% first mortgage 50-year gold bonds, \$1,750,000; 5% second mortgage 50-year gold bonds, \$2,000,000; Collateral Car Trust 5% 20-year gold bonds, \$1,000,000; 5% preference shares (non-cumulative), \$1,750,000; ordinary shares, \$1,750,000; total capitalization, \$8,250,000. Holders of shares in the present company will receive per share for the \$10 assessment \$10 in new second mortgage bonds, \$25 in new 5% preference shares, and \$25 in new ordinary shares, making in all \$60 worth of bonds to cover each share of \$50, and the \$10 assessment. Holders of Collateral Car Trust bonds will receive in exchange therefor an equal amount of similar bonds of the new company secured by the same collaterals. The Car Trust fund of \$1,000,000 will enable the company to compete in matter of time with other companies, for the trust will turn the cars into cash as fast as they are completed. The company holds \$195,000 of surplus bonds which will not be issued except as may be deemed expedient by the reorganization committee. This committee is made up as follows:—William Brander, David Comfort, Charles T. D. Crews, John M. Douglas, Harry K. Paxton, Charles Richardson and Charles M. Rose. The committee proposes to introduce many important reforms and to strengthen the management in America. In order to secure more immediate and effective control of the administration of the company's affairs the majority of the directors will reside in England. The company's accounts will be regularly audited by English chartered accountants. Holders of present real estate 6% bonds will receive for each \$1,000 bond \$1,100 in new first mortgage bonds. Interest becoming due or accruing between the present time and July 1, 1892, to be paid in cash. Holders of consolidated first mortgage 5% bonds will receive for each \$100 of bonds, including the funding of interest thereon to Oct. 1, 1892, \$533.33 in new first mortgage bonds. Holders of present 6% debentures, due January 1, 1892, will receive for each \$100 of debentures, including funding of interest thereon to Oct. 1, 1892, \$552.50 in new second mortgage bonds.

MACHINERY AND SUPPLIES WANTED AT HOME AND ABROAD.

If anyone 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.

Any manufacturer or dealer wishing to communicate with the parties whose wants are given in this column can obtain their addresses from this office. No charge will be made for these services.

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

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

GOODS WANTED AT HOME.

- 2,304. A machine to grind rosin, glauber salts, etc. Tennessee.
2,305. Ten thousand and three hundred feet T steel rails, heavy enough for electric cars. Texas.
2,306. Five miles of water mains. Virginia.
2,307. Automatic engines and boilers. Alabama.

- 2,308. Brick and cotton machinery. Alabama.
2,309. Wood and metal working machinery and tools of various kinds. Maryland.
2,310. Brass, copper, sheet-iron, insulated wire, etc., suitable for electrical and mechanical specialties. Maryland.
2,311. A band-saw mill outfit for sawing cedar. Alabama.
2,312. A double stave jointer. Tennessee.
2,314. A second-hand six horse power boiler and engine complete. West Virginia.
2,315. A pony planer, a 25-inch band saw, a scroll saw, a 12-inch wood lathe, shaper, a rip-saw table, and a 10-inch saw complete; second-hand. West Virginia.
2,316. A corn mill that bolts the meal. West Virginia.
2,317. A float or current water wheel. Tennessee.
2,318. An entire outfit for mining "earth pebble phosphates." Alabama.
2,319.—Twelve-lb. steel rails for eight miles of track; also locomotive and 4 or 6 cars for track 36 inches gauge, all for logging purposes. Virginia.
2,320. Machinery for mining pebble phosphates on a large scale. Florida.

AMERICAN GOODS WANTED ABROAD.

- 2,313. A prominent importing firm which has been established in Peru 30 years, and has large business connections along the coast wishes to communicate with manufacturers who desire to extend trade in that country in the following articles: Rifles, revolvers, ammunition, dynamite, baby carriages, baking powder, balances, brooms, salmon, chairs, electric bells and lamps, St. Louis beer, furniture, latest invention in economical gas burners, gold pens, first-class gold-plated jewelry, kerosene and gas lamps, lard, lumber, hardware, harmoniums or rather organs, ice cream machines, electroplated goods, nail pullers, novelties, pencils, printer's inks, saddlery, rubber clothing, perfumery, windmills, blue drills, denims, Shetucket stripes, Indian Head shirtings, twilled gray cottons and shirtings, cooking stoves, ready-made shirts, sawing machines, traveling trunks, and whiskey. Peru.
2,321. Furnace using gaseous fuel for the reduction of tin ore. Peru.

GENERAL MINING NEWS.

Owing to the late start in iron ore shipping operations reports of tonnage so far sent forward have been unsatisfactory. We are able to append a list, which, although not up to date, will give the reader an idea of the extent of operations on all ranges, except the Marquette. The report includes shipments from Escanaba, Gladstone, to June 24th; Ashland and Two Harbors, July 1st; Marquette, May 13th:

	Tons.
Ashland.....	258,048
Escanaba (Menominee range).....	14,846
Marquette.....	5,945
Gladstone.....	30,689
Two Harbors.....	194,43
Total.....	504,451

TENNESSEE COAL, IRON AND RAILROAD COMPANY.—On the 29th ultimo this company filed suit against the Birmingham Mining and Manufacturing Company for \$100,000 damages. It is alleged that the defendant has violated the terms of a contract with the plaintiff. It is understood that the plaintiff contracted with the defendant for the delivery of certain amounts of materials annually for the period of 10 years. That this contract has been violated and that the defendant has made a contract for the same work with the Alabama Great Southern Railroad.

ALABAMA.

(From our Special Correspondent.)

On the 1st inst. the contracts between the miners and companies for coal mining for the ensuing year were renewed. No demands for an increase were made and the old rate of 45c. per ton still holds. Blocton and Blue Creek were unrepresented at the meeting, but subsequently signed the old contract.

ALASKA.

ALASKA-TREADWELL GOLD MINING COMPANY.—The result of the June clean-up was as follows: Bullion, \$54,500; working expenses for month, \$26,000. The mill ran 28 days, crushing 18,150 tons of ore. There were 513 tons of sulphurets treated, and of the bullion output \$13,230 were from sulphurets.

(From our Special Correspondent.)

Mining operations in Alaska are being steadily prosecuted this season. The Taku Consolidated Mining Company's stamp mill, which was idle last season owing to the trouble in the company, has been running for some time past. The Alaska-Treadwell mill is running at full capacity as usual; work in the mine is being rapidly pushed and the showing is very satisfactory thus far. The Silver Queen Company has nearly completed its ten-stamp mill and will soon be able to test its applicability to concentrating its low grade silver ore.

In the Berner Bay district a placer mine has been opened which promises well. The property purchased last fall by the German syndicate has had nearly \$40,000 spent upon it in development work during the past winter. The company is working but two men at present, who are engaged upon a 100-foot prospecting tunnel. The Shuck placer mine, also owned by the German syndicate, has been opened, and is now about in condition for commencement of washing. This syndicate has considerable ground, and unless something unforeseen occurs the working of it should prove quite remunerative.

The Willoughby mine, on Admiralty Island, the most promising mine in Alaska, aside from the Treadwell, and the only mine thus far opened that can boast of a well-defined and true fissure vein, is being closely looked after by several companies; but as the owner has a Huntington mill on it and can take out all the gold he needs, he does not seem to be in any great anxiety to sell.

Several sacks of coal were recently brought in from the coal mines of the lower part of Admiralty Island. This is a fine quality of bituminous coal, very free burning and quite clear from rock. This coal section should receive the attention of some good company.

Lieutenant Schwatka started for the interior of Alaska via the Taku river on May 18th. He proposes to devote two years to the investigation of unexplored regions. Mr. Schwatka, who is sent out by a New York newspaper, is not in search for mineral particularly, but has taken a well qualified prospector with him and will mark the locations of any discoveries.

ARIZONA.

PIMA COUNTY.

(From our Special Correspondent.)

PEER MINING COMPANY.—The stopes on the 100-ft. level, near the north line, continue to look very well, the ore showing strong in the breasts, and being of the usual good quality. On the 150-ft. level fair progress is being made in the west cross-cut, and as soon as connection is made and ventilation afforded, drifting will be commenced north and south, to develop ore that is showing.

PEERLESS MINING COMPANY.—The exploration work in the 1,600-ft. level is progressing favorably; the formation is quartz, with some ore of good grade.

WELDON MINING COMPANY.—The bottom of winze No. 1, in the south drift, 100-ft. level, is all in quartz, with ore of good grade scattered through it.

CALIFORNIA.

BODIE COUNTY.

* STANDARD CONSOLIDATED MINING COMPANY.—Eastern officers of this company are in receipt of advices that a bullion shipment of \$25,000 has been made on June account.

SAN BERNARDINO COUNTY.

SAN JACINTO ESTATE, LIMITED.—This company shipped 38,000 lbs. of pig iron to the American Tin Plate Company, of St. Louis, on the 4th inst., according to telegraphic reports.

SAN DIEGO COUNTY.

CARGO MUCHACHO.—Not more than a mile and a half from the once famous Padre y Madre mine, at the base of the Cargo Muchacho mountains, is the mine of the same name, a fissure which has been opened along its course hundreds of feet and into which shafts have been sunk nearly 400 feet deep. Thousands of tons of quartz have been mined from this vein, which was hauled seven miles to Ogilby on the Southern Pacific road, and transported thence by rail to a quartz mill at El Rio, on the Colorado River. Until recently the mine has lain idle owing to litigation, but last year Mr. Blaisdell removed the mill from the Paymaster, about 30 miles northward, and rebuilt it at Cargo Muchacho. A double pipe line, 14 miles long, was laid from the Colorado River to the mine, a powerful pump at the river forcing water to the mill. The property is again in successful operation.

(From our Special Correspondent.)

A new silver camp has been established in the Colorado desert about 50 miles east of Julian, near the confluence of Camso Creek and the Santo Ysabel River. The original discovery was made about three weeks ago by a prospector named Higgins, for whom the new district has been named. The ore is found in lava rocks of red and yellow color. It assays from a few dollars up to \$300 and \$400 per ton, the average of the better claims being \$40 or \$50. A number of claims have been located, though owing to the inaccessibility of the new find the development has been necessarily slow. Provisions and tools have to be packed on burros, and there are many difficulties to overcome. The district is said to be quite extensive, but as yet, little is known concerning it. At the outset there was the usual rush following the original discovery, but the adventurers are now beginning to go back again, having staked out several claims apace and done no work.

Another new strike is reported as having been made near Dos Cabezas Springs, 40 miles north of Julian, where a vein from one foot to two feet in width has been found carrying gold at the rate of \$40 per ton. Four tons milled at the Helvetia

Mill in Julian resulted in a clean-up of \$160. This latter strike seems *bona fide* and promises to develop into a mine.

A number of Americans in San Diego are fitting out for a summer campaign of prospecting in Lower California, along the line of the new rail road now in course of construction between San Diego and San Quintin Boja, Cal.

COLORADO.

Mineral Surveys approved by the United States Surveyor-General of Colorado, during the week ending July 3d, 1891: Survey number, 6854; Land District, Central City; name of claim, Jenny Lind; 6827, Gunnison, Robert E. Lee No. 2; 6927, Central City, Free Coinage; 6952, Gunnison, Delphos; 6873, Leadville, Berlin, Fraction, C. B. and Q. Extension, Gold Run No. 1, I. X. C. D. Valley and H. B. D. lodes; 6953, Central City, Ocean Wave.

COLORADO SMELTING COMPANY.—The Madonna mine, at Monarch, is said to be making an output of about 40 tons of ore per day. A force of 50 men is at present employed. The mine is being worked through tunnel No. 4, the stopes being about 1,300 feet from the entrance. All ore is broken between No. 4 and No. 3, the ore body having been worked out above the latter. There is a good showing in the floor of No. 4, and the continuation of the ore body will undoubtedly be cut by No. 5 when the latter is driven far enough. The breast is now in 1,400 feet, and is in vein matter. It is expected that it will have to be driven about 75 feet more.

PENNSYLVANIA MINING COMPANY.—At a meeting of the stockholders of this company held on the 20th ult. in Philadelphia, Pa., it was unanimously voted to change the capital stock from assessable to non-assessable, and the charter is to be amended accordingly.

BOULDER COUNTY.

(From an Occasional Correspondent.)

The Columbia Mine, located just east of the Nitrot and Madeleine, and on the same vein, is in bonanza. A big vein of excellent ore has been uncovered in the lower workings, and the mine, always good, is now better than ever. Still farther to the east the Utica is still paying handsomely from the ore bodies opened a long time ago. If all of these mines, and a half dozen others on the same great lode, could only be consolidated and placed under the control of one strong company, it would be difficult to find a better property. It could be opened in the gulch near the center of the claims and worked both ways. The ore could be dumped directly into a mill for the treatment of low-grade material. All timbers, lumber, and fuel would then be hauled down-hill, and the up-hill hauling of supplies be greatly lessened. The cost of supervision would probably be reduced 85%, and be much more effective. As for ore, the quantity is undoubtedly very large. The vein varies from 6 to 75 ft. in width, and has been opened for a length of 1½ miles.

Among other Ward mines now being worked are the Morning Star and Morning Star Extension, Moltke, Gage, John B. Sherman, Irus Coy, and Puzzler. The Modoc will start up very shortly. Of the above, the Moltke, Gage, Sherman, and Coy belong to the Chicago & Colorado Mining Company, of which Col. Wesley Brainard is the president and manager. The claims mentioned, with about thirty others, constitute one of the finest properties in the county, a property that will become famous some day. Nothing but development work is now being done, and all ore taken out is being piled on the dumps. The owners have plenty of money, and are spending it quietly and to good advantage. Lodes, mill sites, and placer claims are being patented, and when the time comes to show what their mines can do they will not have any troublesome neighbors.

As usual Boulder is watching with interest some new processes that are to revolutionize methods of ore treatment. Those most prominently before the public at present are the McArthur-Forrest-cyanide process—and the "Cochran Releaser." So far the death-rate among the "new processes" tried in this county has been very high—about 100%, the deaths averaging two per annum. It is greatly to be desired that the "Cochran Releaser" should escape the fate of its predecessors. This horrible mortality should be checked.

Our oil well is now about 1,500 feet deep, and is said to be in the "oil sand." It is to be hoped that this is not a false alarm; but there seems to be a good deal of mystery about the movements of those having charge of the work.

A few of those who were so anxious to shut out Mexican silver-lead ores have finally become convinced that the movement was not wholly in their interest. A great many, however, among those most injured are desirous of more "protection" of the same sort. It is amazing that their eyes have not yet been opened to the injuries which the lead tariff has already worked on their own interests.

CHAFFEE COUNTY.

ECLIPSE MINING COMPANY.—This company is shipping about 35 tons of ore per day. Much of the ore is being hoisted from a 120-ft. winze sunk from No. 3 tunnel 1,300 ft. from the entrance to the latter. At this place a body of good lead carbonate ore from 6 to 8 ft. thick has been opened. A raise has also been made for 150 ft. above No. 3, showing ore from 8 to 10 ft. thick and 40 to 50 ft. wide all the way. Connection has not yet been made

with No. 2 tunnel. About 30 men are employed at the mine.

GRAND DUKE MINING COMPANY.—This company is preparing to develop its property near St. Elmo. It is said to have \$50,000 in the treasury for this purpose. Mr. E. E. Thomas is manager of the company.

OHIO MINING AND MILLING COMPANY.—It is reported that this company is about to erect dressing works of 125 tons per day capacity near its mines at St. Elmo. A large body of low-grade ore is said to have been opened in the General Custer mine.

CLEAR CREEK COUNTY.

BURLEIGH TUNNEL COMPANY.—It is reported that high-grade ore has been encountered in a raise from the tunnel workings.

MR. McCLELLAN MINING COMPANY, LIMITED.—The company is shipping about 12 tons of ore per day from the Stevens mine. The ore is galena and of excellent grade.

CUSTER COUNTY.

GEYSER MINING AND MILLING COMPANY.—It is said that a well-defined lode, from 15 to 20 in. wide, filled with quartz carrying galena and antimonial silver ore, was struck by the shaft at a depth of 1,300 ft. At the uncovering of this vein there was an increased influx of water into the shaft, which is now making about 100 gallons per minute.

DOLORES COUNTY.

ENTERPRISE.—The Enterprise group of mines on Newman Hill, which was recently purchased by Messrs. Crawford & Posey for \$2,000,000, has been taken over by a company, the shares of which are to be offered in New York, Boston, Pittsburg, Chicago and other Eastern cities. The prospectus will be issued next week. The company will be capitalized at \$2,500,000 in 500,000 shares of \$5 each. A working capital of \$150,000 will be provided. Development work, which has been carried on in the mines since they were transferred to their new owners, has resulted in the opening of new ore bodies, and they are now said to be looking better than ever. The ore of these mines carries some lead and is of high grade in silver.

LAKE COUNTY.

SMALL HOPES CONSOLIDATED MINING COMPANY.—We make the following abstract of this company's annual statement. Mr. S. W. Mudd, manager, reports: Early in June, 1890, prospecting from the McCormick shaft was abandoned, and since that time the greater part of our work has been on the Forest City claim, in the neighborhood of the old bonanza stopes. Much ore has been taken from these stopes and much from the virgin ground near them. The persistent and thorough development which is being carried on continues to prove much of this portion of the Forest City claim to be valuable. The work of the past year proves that over almost the entire ground covered by the old stopes there is a varying thickness of from 5 to 20 feet of marketable iron ore. This is gradually becoming more and more valuable and will eventually be a source of great revenue. Eighty five men are now employed at the mine. The total shipments from the Forest City claim for the year were 15,537 gross tons, yielding \$129,171.81. This output may be divided as follows: Iron ore 7,009 gross tons, average silver assay, 9.18 oz., yielding \$29,575.16, and dry oxidized ore and some ore carrying a little lead, 8,523 gross tons, average silver assay 20.69 oz., yielding \$99,596.65. The average grade of this ore was quite low, but the profit was good, being \$38,094.14, or 28.43% of the gross receipts. The Robert Emmet claim yielded only 424 gross tons, valued at \$2,443.52. The average charge for smelting the dry oxidized ore was \$1.80 per ton less than for the previous fiscal year. The prices received for iron ore were also better than ever before. The total amount received during the year from sales of ore was \$153,648.82; the total outlay at the mines for expenses, \$110,300.56, and the profit, \$42,842.26. The expense per gross ton of putting the ore on the surface was about \$1.25 less than for any preceding year, and for the past three months this expense has been reduced to a figure \$1.35 less than the average for the fiscal year. All the items which enter into this total show a decrease, except those of lumber and timber. The greatest saving is in labor, and this may be explained by the fact that the mine has gradually been put in excellent condition for breaking and handling the ore economically. The dumps of the Kerens, Cary, Elkins and Denman shafts were worked from early in the summer of 1890 until the severe weather of the autumn. All of these dumps proved very profitable. The profit was largely increased by the fact that the price of silver was high when the greater part of the ore from them was shipped. The amount of ore derived from these dumps was 4,047 gross tons, which yielded \$24,513.01 at an expense of \$9,533.69, leaving a profit of \$14,979.32 or 61.1% of the total value. The work in the lower levels of the Maid of Erin mine on the copper-bearing sulphide ore has been satisfactory to the owners of that property. This development strongly indicates that the course of the lower ore chute, which has been so productive during the past year in the Maid of Erin and

Adams claims, is in a direction almost east, and that it will pass south of the Emmet shaft. If such is the case a portion of this very valuable ore body will extend into the territory of the Small Hopes Consolidated Mining Company.

OURAY COUNTY.

AMERICAN BELLE MINES, LIMITED.—Preparations are being made for the erection of the smelting plant at Durango, and construction work will be commenced soon. It is not likely that the works will be completed, however, before the end of the year. They are to be designed for treating 300 tons of copper ore per day, but will be equipped for only 200 tons per day at first. It is not unlikely that a lead smelting plant will be erected in connection with the copper plant. The Ute and Ulay Mines, Limited, which is controlled by the same management, and is now producing a large amount of high grade lead ore, guaranteeing a supply of the necessary silver gathering element. The American Belle mines will not be called upon to make a large production until the new smelting works are completed. A considerable amount of copper ore has also been opened in the Yankee Girl mines, and is now left standing, from which the American Belle smelter will draw a portion of its supply.

PITKIN COUNTY.

TAM O' SHANTER.—It is reported that operations are to be resumed in the Tam o' Shanter and Montezuma mines, near Ashcroft, which have been idle for several years. There is said to be a large amount of low-grade lead ore in these mines, of which ex-Governor Tabor is chief owner.

IDAHO.

RUBY CREEK MINING AND TOWNSITE COMPANY.—This company has been organized to carry on operations in Latah, Nez Perce, Kootenai and Shoshone counties. The capital stock is \$100,000, shares \$1 each, the principal place of business being Moscow. The incorporators are: M. J. Shields, Charles Jones, Joseph Neiderstadt and John Kanaley, of Moscow; Charles Durant, of Tekoa, and Charles Gammell, of Ruby Creek. The officers are: M. J. Shields, president; John Kanaley, vice-president; Joseph Neiderstadt, treasurer; W. T. Griffin, secretary, and Charles Gammell, superintendent. Four thousand dollars will be raised immediately to begin operations, and preparations are making for sinking a shaft in one of the prospects.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—The statutory general meeting of this company was held in London on the 23d ult. The company was registered on March 3, and on March 7 the prospectus was issued. The allotment took place immediately afterward, Captain De Lamar, the vendor, taking 205,000 shares out of the 400,000. There were privately allotted before the prospectus had been issued 145,000 shares, and there were offered to the public 50,000 shares, which were applied for three times over. Not less than 40,000 shares were allotted to American applicants, and of these 17,000 were taken by employes of Captain De Lamar. There were 1,000 shares allotted to parties in Paris. The company took possession of the mine on April 4, and work was commenced on the following day. Since that time operations have been conducted vigorously, and it is expected that the company will be in position to declare its first quarterly dividend during the current month. The main tunnel at the mines, called the Voschay, which is 250 ft. below the crest of the hill, has been driven through the hill, connecting with a tunnel in the Sommerkamp. The combined length of the two tunnels is 3,500 ft. The Louis Wahl tunnel, 208 ft. below the Voschay, is in 1,309 ft. the breast being in highly mineralized ground, and it is expected that it will soon encounter the vein series. A winze which is being sunk in the "77 ft." vein to connect the two tunnels, is now down 140 ft. on its dip, or 70 ft. perpendicularly, and is in very rich ore. The average grade of the ore milled during April and May was \$32.50 per ton, which was considerably in excess of estimates in the prospectus. In the milling ore the gold has constituted about 60% and the silver 40%. The value of smelting ore mined each month has been between \$10,000 and \$12,000, and it is thought that this production will be maintained. The smelting ore which is very rich in silver occurs in the veins at points where a "clay" dike, which cuts across the whole series, intersects them. The management at the mines is considering an increase in milling capacity, the present mill of 20 stamps crushing but 45 tons of ore per day. The ore reserves in the three principal veins, estimated in the prospectus at between 60,000 and 80,000 tons, have been increased since the company took over the property. The two other veins, the ore of which was not included in the estimate, have hardly been worked at all as yet.

SHOSHONE COUNTY.

An exchange gives the following estimate of the daily shipments in tons from the Cour d'Alene mining district: Bunker Hill Sullivan, 80; Last Chance, 30; Gem, 30; Frisco, 30; Black Bear, 10; Tiger, 40; Poorman, 50; Hunter, 20; Morning, 20; Custer, 20; Granite, 20; Sierra Nevada, 25; other properties supplying irregularly, 50 Total, 425. An average of the concentrates is about 50 ounces of silver per ton, and 55 per cent,

lead ore that is shipped will average more than the concentrates.

WASHINGTON COUNTY.

The Middle & Lang smelter at Mineral, under the superintendency of Mr. Herbert Lang, has recently commenced operations for the season. Messrs. Wing & Duffy have begun the construction of a new smelting plant at Mineral, to be completed within the next thirty days. The Porphyrite smelter is daily reducing 35 tons of ore.

Reports from the Seven Devils district are to the effect that the camp is rather dull, mainly owing to the poor condition of the roads. The new road to Baker City, to be about 150 miles long, is being built. The Union Pacific people have run a preliminary survey into the country from Payette; and the Northern Pacific, it is rumored, will extend the Spokane & Palouse branch into the district. The owners of the Golden Eagle, it is said, have refused an offer of \$50,000 for their property. The shaft is down only 15 ft., but the ground has been stripped for considerable distance and shows a good deal of ore.

INDIANA.

It is reported that gold has been found near Monrovia and considerable excitement has been caused thereby in the vicinity of that place.

KANSAS.

A special report shows that during the week ending July 4th the output of ore from the mining districts of Galena and Empire City was: Rough ore, pounds milled, 1,937,020; rough ore, pounds sold, 1,125,270; zinc ore, pounds sold, 902,070; lead ore, pounds sold, 292,040; sales aggregated a total value of \$17,223.

MICHIGAN.

Washington advices state that there is a hitch in the proceedings for the acquirement of the Portage Lake Canal, which may result in postponing indefinitely the necessary improvements. It seems that certain lands contiguous to those lands abutting on, and belonging to, the canal had been purchased by the Canal Company, and were held in trust by Nowie and Johnson, two stockholders of the Canal Company. These lands have just been held to be a part of the Canal Company's possession by the Judge Advocate General and included in the government purchase. Hence it is necessary that the government should secure a perfect title to these lands abutting on the canal. The heirs of Nowie and Johnson, the trustees, are scattered over this country and Europe, and it is believed it will require a year at least to secure quiet claim titles from those heirs.

COPPER.

The Boston *Traveller* on the 8th inst. published the following: A prominent local copper man in speaking to-day of the rumors of a possible union of the Franklin mine with the Quincy, says: "I am satisfied that sooner or later this combination will be effected. Had the Quincy people been disposed to establish harmonious relations, it could have been brought about long ago. A union of this sort is the only right solution of the Pewabic controversy. The Quincy people need the Franklin property in order to properly develop the Pewabic, and it would be economy for them to buy it. They could well afford to pay \$1,000,000 at least for it, and it would then, in their hands, be even more profitable than it is now, and the stock correspondingly worth more money."

ALLOUEZ MINING COMPANY.—This company's June product of mineral was 120 tons.

ATLANTIC MINING COMPANY.—This company's June product of mineral was 215 tons.

CALUMET & HECLA MINING COMPANY.—The product of this company for June was the largest in its history, being 4,126 tons, 420 lbs. of mineral.

CENTENNIAL MINING COMPANY.—No. 6 shaft of this company's mine, which is laid out for a double-skip roadway, is about 600 ft. deep. The first level is in between 600 and 700 ft. north. There it is said the vein is 6½ to 7 ft. wide. A substantial rockhouse, 50 × 40 ft., has been erected. It was expected to start the stamp on the 10th inst. No. 6 rockhouse north and No. 4 rockhouse south have been connected with the stamp mill by a railroad.

FRANKLIN MINING COMPANY.—A Boston exchange says that this company has in hand an important "deal" in the shape of a new acquisition, that will develop at an early date. Another contemporary announces that explorations are being carried on by the company with a view of locating the Calumet conglomerate. The company's product for the month of June was 203 tons, 110 lbs. of mineral.

KEARSARGE MINING COMPANY.—This company's June product of mineral was 86 tons.

OSCEOLA CONSOLIDATED MINING COMPANY.—This company's June product of mineral was 305 tons.

PENINSULA MINING COMPANY.—This company's June product of mineral was 80 tons.

QUINCY MINING COMPANY.—This company's June output was 569 tons, 1,145 lbs. of mineral. On the Pewabic location a branch line is being built from the main line of the Quincy & Torch Lake Railroad to the site where the new rockhouse will be built. This rockhouse will be constructed

200 ft. south of the shaft, and much on the same plan as the present Quincy rockhouse. Excavations are being made, and the foundations are well advanced for a new 50 × 70-ft. engine-house, situated some 500 ft. east of shaft. The hoisting engine is now being built by E. P. Allis & Co., of Milwaukee. The shaft, which will probably be called Quincy No. 6, is down to the 34th level, and the work of repairing and enlarging for a double-skip shaft is now going on. It has already been completed to the fourth level, and the work is being pushed along rapidly. The water is up to the 25th level. The work of forking out the mine will commence shortly. At the mill additions are being made to contain two more head of stamps.

TAMARACK MINING COMPANY.—This company's June product of mineral was 930 tons.

TAMARACK-OSCEOLA COPPER MANUFACTURING COMPANY.—At a special meeting of the stockholders of this company, held in Boston last week, it was voted to consolidate the smelting department of the business with the same branch of the Detroit & Lake Superior Company's business at Portage Lake. The rolling mills will be operated, as heretofore, by the Tamarack-Osceola Copper Manufacturing Company, and the Detroit company will retain its interest in its property at that city. The smelting department of the two will be consolidated into a new company, to be called the Lake Superior Smelting Company, with a capital of \$1,200,000 in 48,000 shares, par value \$25. This stock will be divided proportionately between the interests represented.

TECUMSEH MINING COMPANY.—The drift south on the Osceola lode is now in some 400 ft. When it is extended another 100 ft. it will reach the site of an old shaft or pit. When this point is reached the shaft will be deepened, with a view of cutting the chute of copper dipping south from the Osceola. In mining this south drift a branch showing much stamp copper was encountered. The breast of the drift is in promising looking ground, although it carries but very little copper. Sinking to the depth of about 65 ft. has been done on the Kearsarge lode, which was encountered in the crosscut some 40 ft. east of the eastern shaft, and a crosscut, which is in about 40 ft., is being run to tap the west lode. This belt, at the Kearsarge mine, near the surface, is about 65 ft. distant from the east lode, although in the lower levels of the Kearsarge the two lodes come together.

IRON—MEMORINE RANGE.

LEE RECK.—This mine is soon to be worked on a large scale by Messrs. King & Wilson, and a plant of machinery has been set up preparatory to the operations. The property is known to contain a large vein of ore. Capt. E. Florida, late of the Dunn mine, is the superintendent.

MISSOURI.

JASPER COUNTY.

(From our Special Correspondent.)

JOPLIN, Mo., July 6.

The Fourth of July celebrations interrupted work in the mines, and the output last week was below the average, ore sales showing a decrease in consequence. There is practically no change in the ore market. The average price paid for zinc ore was \$23.50 per ton. Lead remained at \$25.50 per thousand. During the first six months of 1891 this district has produced and sold lead and zinc ore valued at \$1,781,838.58. Almost all the surplus stock of ore is cleaned up, so that the district commences the last half of the year under the most favorable circumstances, and with the increasing demand for zinc ore the operators feel that there will be an advance in price.

Following is the sales of ore from the different camps during the past week:

Joplin mines 1,320,640 lbs. zinc ore and 114,850 lead; value \$18,453.70.

Webb City mines 929,490 lbs. zinc ore and 71,890 lead; value \$12,751.25.

Carterville mines 1,312,930 lbs. zinc ore and 101,300 lead; value \$18,000.25.

Zincite mines 239,260 lbs. zinc ore and 1,530 lead; value \$2,941.75.

Galena, Kans., mines 1,125,270 lbs. zinc ore and 292,040 lead; value \$17,223.

District, total value \$69,369.95.

Pittsburg, Kans., smelter output: R. Lanyon & Co., 189,700 lbs.; S. H. Lanyon & Bro., 96,800 lbs.; W. J. Lanyon, 97,000 lbs.; Granby, M. & S. Co., 96,900 lbs.; Weir City Zinc Co., 180,000 lbs.; Pittsburg-St. Louis Zinc Co., 75,700 lbs.; total, 736,100. Coal output, 13,000 tons. The Big Run mine, owned by Williams and Orr, on the Jasper Mining Company's land, north of the city, produced last week 67,260 lbs. of clean zinc ore. The Oswego Mining Company made no turn-in on account of the breaking down of its pump machinery, which is now being repaired. Rice & James operating the Mahuska land, are mining on large bodies of ore and last week produced 64,750 lbs. of zinc ore. Snyder Bros. sold 270,640 lbs. zinc ore and the Star mine 80,740 lbs., all from Mrs. Allen's land southwest of Joplin.

The Roaring Springs and Possum Hollow districts, 3 miles southwest of Joplin, are showing some wonderful deposits of zinc ore, and some large plants of machinery are being put in.

The Lehigh and Carl Junction district is making general and substantial improvements, many of the old mines that were such large producers of

surface ore in the early days of zinc mining in Missouri, being reopened. The owners of the White Elephant mine have incorporated as the White Elephant Zinc Company, with a paid-up capital of \$40,000. This company is now working on a fine run of free zinc ore, which is dressed at the rate of a ton an hour in the concentrator. F. L. Johnson, of St. Louis, who has a lease on the Neighbors' land, is still pushing development and increasing his plant of machinery so as to make pump connections from the central plant to pump shafts located at different points on the land. Mr. S. A. Stuckey, of Carl Junctions, is developing some land for Chicago parties with favorable indications of ore.

MONTANA.

This year the outlook for the placer ground workings is said to be more promising than it has been for many years, owing to the ample supply of water. The assay office where most of the placer gold is bought reports the receipts so far this year to be in excess of those a year ago.

Messrs. Thomas J. Riste and Louis F. Knaak, of Columbus, Wis., recently secured a bond upon the Nevada King, the Nevada King Extension quartz lode mining claims, and the Nevada King Millsite, New World district. The bond is given by Robert L. Morton, James Hall and Daniel Ross, of Cooke, and Thomas G. Ross, of Castle. The conditions are the cash payment of \$6,000, the payment of \$2,000 on July 2, and \$4,000 on December 1, 1891, with 6 per cent. interest.

In the suit of the Northern Pacific Railroad Company v. R. P. Barden *et al.* concerning possession of section 27, township 10, north of range 4 west, covered by the grant given the company in 1872 of certain public land not mineral, Judge Lorenzo Sawyer, has decided against defendants, Barden and others having located mineral deposits on the land in question in 1888. The United States refused to issue to the company a patent for the disputed premises, the value of which is alleged to be \$6,000, and that of ore extracted, \$100. Judge Sawyer holds that "mineral land," in the clause "that all mineral lands shall be excepted from the operation of this act," in the legislative grant to the railway company, must be interpreted so as to exclude from the operation of the grant only such land as is known to be mineral at the time when the line of the road becomes definitely fixed, and a plat thereof filed in the general land office. The case will be taken to a higher tribunal.

MOULTON CONSOLIDATED MINING COMPANY.—This company has been organized by George Harding, F. W. Zingler, James M. Clifton, W. T. Houston, J. H. Johnson, R. E. Labar and Henry E. Jones, with a capital stock of \$1,000,000, shares of \$1 each. The operations are to be carried on in the Barker and Neihart mining districts. The principal place of business will be in Great Falls.

CHOTEAU COUNTY.

Since Mr. Ralston made his discovery of iron ore in this county public some three weeks ago, many locations have been made and quite an excitement has prevailed, according to the local papers. Samples of the ore sent to Carnegie, Phipps & Co. are said to have analyzed 61.25% iron.

DEER LODGE COUNTY.

COMBINATION MINING AND MILLING COMPANY.—The president of this company, W. G. Lewis, has issued a letter to the stockholders in which he gives an account of the present status of the mine and the reason why an assessment of 5c. has been ordered. The company has never paid any dividends, and closed the mill last December owing to the declining price of silver. In January, 1891, a small force of miners was put to work sinking the new shaft to the vein (now known as the Harrison shaft) located 500 feet lower upon the dip, 300 feet northwesterly upon the strike on the Combination vein. The ore was encountered in place at the depth of 255 feet, and from this point drifts have been extended along the strike of the vein in both a northwesterly and southeasterly direction; these drifts aggregating at the present time about 350 feet in length, and exposing for nearly the entire distance a chute of milling ore. This amount is claimed to be sufficient to keep 25 stamps running for 25 months; and in order to reduce the cost of milling 10 stamps will be added to the present 10. The management intends to call for at least 12 cents in 3, 4 or 5 cent payments per month, according to the needs and progress of the work.

GRANITE MOUNTAIN MINING COMPANY.—The *St. Paul Globe* publishes an interview with President L. M. Rumsey, according to which the company has refused an offer from an English syndicate of \$20,000,000 for the property.

WAVERLY MINING COMPANY.—This company has been organized with a capital stock of \$750,000, by Charles Roel, J. B. Hopkins, G. C. Hopkins, H. G. Klenze and Charles Anceny. The company's operations will be carried on on Snow Creek.

JEFFERSON COUNTY.

TREASURE HILL MINING COMPANY.—This company's property is located on Prairie Gulch, about five miles northwest of Radersburg, and embraces four claims, the Treasure Hill, Little Leadville, Hillside and Perrin, all contiguous. In the plan

of organization of this company there are several features worthy of notice. The capital stock consists of 500,000 shares, 100,000 of which are full paid, non-assessable and entitled to one preferred dividend of five cents per share. The remainder of the stock, 400,000 shares, is assessable, but, by an irrevocable by-law and conditions embodied in the stock certificates, the trustees are limited, in their power to levy assessments, to one assessment in any given month, of not more than one mill per share. Thus the power of a majority to "assess out" the minority is unalterably provided against. Of the non-assessable stock but 25,000 shares have been disposed of, the treasury retaining 75,000 shares as a "sheet anchor of safety" against any possible contingency.

SILVER BOW COUNTY.

PARROT SILVER AND COPPER MINING COMPANY.—This company has, on the 2d inst., added to its possessions the Little Mina claim, which lies just northeast of the Belle of Butte and southeast of the Buffalo. The property was owned by John Stewart, Emanuel Hauswirth, Simon Hauswirth, and Ed. Hickey, who, about eight months ago, bonded it to the Parrot company. The price received by these gentlemen was \$103,500. The Parrot company also had a bond on the Nipper, which adjoins the Little Mina on the southeast, but this bond was allowed to go.

At the annual meeting of this company, held in Butte on the 1st inst., Franklyn Farrell was elected president, S. T. Hauser vice-president, J. E. Gaylord secretary and treasurer, and Franklyn Farrell, A. F. Mageon, Mr. Thurrell, S. T. Hauser, J. E. Gaylord, A. M. Holter and C. E. Tomlinson directors. No new improvements will be made to the property this year besides those in course of construction. At the smelting plant two new converters are being placed in position. The mine, which has been closed down pending the erection of the new hoisting plant, was started up on the 1st inst. in order to keep in operation the smelter and concentrator, which were running out of ore. Extra dividend of 10 per cent. on the capital stock was declared, aggregating \$180,000. The regular monthly dividend is \$18,000, or one per cent. on the capital stock.

NEVADA.

The financial condition of the following mining companies on July 1st was as follows:

Name Co.	Indebtedness.	On hand.
Navajo.....	\$8,762.19	
North Belle Isle.....	23,845.31	
Belle Isle.....		\$760.23
Del Monte.....	6,909.57	
North Commonwealth.....		2,290.04
Independence.....		2,091.50
Silver King (Arizona).....	3,163.06	
Standard Con.....		11,222.01
Kentuek Ccns.....		10,828.86

*To offset this there is due from other companies \$12,800, and between \$5,000 and \$6,000 from Union Mill Company, of Tuscarora, Nev., account of ore worked in June.

ELKO COUNTY.

(From our Special Correspondent.)

SAN FRANCISCO, July 2, 1891.

The following is the statement of the ore from the Tuscarora group of mines milled last week, with the average battery assays:

Mine.	Tons.	Assay Value.
Belle Isle.....	19½	\$366.97
Commonwealth.....	13½	329
Navajo.....	17	242.04
North Commonwealth.....	31	153
North Belle Isle.....	40	208.30

DEL MONTE MINING COMPANY.—The north intermediate drift has been extended 15 ft., the face showing 2 ft. of ore assaying \$10.

NORTH BELLE ISLE MINING COMPANY.—During 150 days of the fiscal year just ended, there were crushed 7,629 tons of ore, which yielded 422 tons of wet concentrates, having an assay value of \$226.27 per ton. In addition, 1,038½ tons of ore were extracted, which yielded 109 tons of wet concentrates which assayed \$169.70 per ton. No. 2 crosscut, 400 level, has been extended 15 ft., cutting seams of good ore. The east crosscut, 600 level, has been extended 22 ft., cutting some spar giving low assays. Last week there were sent to the concentrator 896½ tons, which yielded 17 tons wet concentrates, having an assay value of \$140.07.

EUREKA COUNTY.

CORTEZ MINES, LIMITED.—The directors have declared an interim dividend of 1s. 6d. per share, amounting to \$112,500.

NYE COUNTY.

(From our Special Correspondent.)

Immediately adjoining the Chispa or Breyfogle mine is the Freeland claim. The vein is from 10 to 30 ft. in thickness and prospects well in free gold. Nearly three miles from the Breyfogle camp, at the Yount mine, the shaft in the main ledge is down 50 ft., and shows a 3-ft. vein of high-grade gold ore. Adjoining these the Stanlee group of five claims shows ledges much larger than the Yount mines. Several other promising locations show well in gold. The Chispa company owns the Electric and Maud R. claims, which are situated two miles west of the Chispa mine. Most of the locations, however, have been made by poor

men who are quite unable to develop them to any extent.

CHISPA MINING COMPANY.—The development of the mine is being pushed rapidly, a force of 25 men being kept at work. The mine is situated in a basin near the foot of a mountain of quartzite and black lime, and is about 4,000 ft. above sea level. The vein runs from 2 ft. to 8 or 10 ft. in thickness, and the pay chute, as far as developed, seems to be about 550 or 600 ft. in length. It is a contact fissure vein, with quartzite on the hanging, and lime shale, or slate, on the foot wall. The ore is of high grade. The company's prospecting mill will be set up six miles from the mine, at a large spring, and will soon make its initial run.

STOREY COUNTY—COMSTOCK LODE.

(From our Special Correspondent.)

The following is the weekly statement of Comstock ore milled, with the average battery assays:

Mine.	Tons.	Assay value.	
		June 27.	June 20.
Con. Cal. & Va.....	2,345	\$29.12	\$38.90
Chollar.....	546	18.22	23.09
Justice.....	172	14.05	23.89
Ophir.....	25	21.00	17.08
Overman.....	630	16.08	17.25
Savage.....	610	16.57	17.25
Yellow Jacket.....	*280	18.00	18.00

*Approximate.

ALTA MINING COMPANY.—The Gold Hill mining companies, which composed the Comstock Pumping Association, have concluded arrangements with this company for the starting of the powerful Alta pumps, by which means the lower levels of all the mines involved will be drained in a much shorter time than was originally anticipated. At the meeting recently held, S. L. Jones, R. F. Morrow and W. E. Sharon, representing the Gold Hill companies, W. J. Eckert, consulting engineer of the association, and C. Derby and E. D. Boyle, representing the Alta company, concluded negotiations. The basis of the contract whereby the bailing tanks at the Alta shafts are to be started was agreed upon, and the contract has since been signed. The bailing tanks in the Alta shafts are to be run for 30 days, with the privilege of an extension beyond that time, one-half of the expense to be borne by the Pumping Association. The Alta company is anxious to lower the water to its 1,350-ft. level, where good ore is known to exist; and, so far, this accounts for the company meeting the overtures made to it half way. On the other hand, the Gold Hill companies find it necessary to have aid in pumping out the water which is dammed up in the region south of the Crown Point incline, where pumping is being carried on with some difficulty. It is believed that the combined efforts will lower the water to the 2,000 level within five or six weeks.

CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.—Bullion valued at \$47,759.75 has been shipped during the week from the mine to the Carson mint, making the total shipments on June account \$152,038.83. Good ore is being stoped in the south drift from shaft station, 1,100 level. On the 1,300, 1,500, 1,600, 1,650, and 1,750 levels the usual amounts of ore have been extracted.

OCCIDENTAL CONSOLIDATED MINING COMPANY.—One hundred tons of fair grade ore were taken last week from stopes on the 350, 400, and 450 levels.

WHITE PINE COUNTY.

OSCEOLA GRAVEL MINING COMPANY.—The general manager of the company states that hydraulic mining was begun on May 8, using 2,000 inch volume of water about seven hours daily. Since May 20 operations have been in full blast almost throughout the 24 hours, using 2,000-inch volume in the mine. Gravel is being boomed off at a much greater rate than ever before, and prospects are highly encouraging, both for water and gold. The ditches hold well; no accident to either has occurred, and cost of maintaining the east ditch is very much less than anticipated. Bed rock cleaning was stopped when the full supply of water began, as it takes the present small force of men to attend to both monitors, which are working most satisfactorily. Whenever the bedrock is exposed, however, nuggets are picked up. On June 17 the mine was running 24 hours with 2,500 inches (40,000,000 gallons) water, and the amount was increasing.

NEW MEXICO.

BEMALILLO COUNTY.

A general strike has been ordered in the coal mines at Gallup. The Atlantic & Pacific Railroad obtains its supply from these mines.

NORTH CAROLINA.

Both the pressure and volume of all the great natural gas wells in and around Findlay, O., have fallen off heavily of late, according to the reports of the Natural Gas Inspector for Indiana, who recently returned from Findlay. He predicts that in two years there will be no gas in Findlay for manufacturing, and is in doubt as to the stability of the Indiana field.

NANTAHALA MARBLE AND TALC COMPANY.—This company, which is operating on the Nantahala River, in Swain and Macon counties, is attracting considerable attention. Its property consists of a tract of land five miles long, em-

bracing 8,000 acres. On the western side of the river is the Western North Carolina Railroad, a branch of the Richmond & Danville Railroad. This road is also building to connect with the Marietta & North Georgia road, which will give cheap transportation south. For a description of the marble an extract from the company's prospectus states: "Across the property there is a ledge of marble varying in width at the outcrop from 100 to 600 feet. At the main quarry it has been cut into the ledge 25 feet. At the second opening it is cut 100 feet into the ledge, at the third 30 feet, and at the fourth (the black marble) 40 feet. This deposit runs nearly northeast and southwest, and it has a slight dip to the east. It runs through the mountains nearly parallel with the river and on a level with the railroad. It may be quarried 500 feet below its outcrop. It extends for four miles through the property." In color this marble is black, dark gray, light gray, dove and pink. Much of it has the green streaks in it which are so much admired. Cheap power can be obtained for large operations from the river, which has a fall of 210 feet on the property, with an aggregate of 12,600 horse-power.

PERSON COUNTY.

VIRGINIA & NORTH CAROLINA COPPER COMPANY.—This company has been organized, with a capital of \$200,000 in 20,000 shares of \$10 each, to purchase of Messrs. A. W. Nowlin & Co. the Yancey copper mines, together with timber land, water rights, etc., comprising 670 acres, situated about five miles from Wooddale station on the Lynchburg & Durham Railroad. According to the prospectus the property has two veins, the main vein 10 feet in width and the "cross vein" 2 feet in width, the former opened to a depth of 120 feet, and showing ore averaging 2½% copper, and the latter opened to a depth of 20 feet with ore assaying 19.7% copper, all of the ore carrying a small amount of silver. The price paid for the property was \$100,000 in fully paid shares and \$30,000 cash in three annual installments, beginning October 20th, 1891. Mr. Peter J. Otey, of Lynchburg, Va., is president of the company; C. C. Dunn, Jr., of Lynchburg, Va., secretary and treasurer; and W. B. Church, of South Boston, Va., manager.

PENNSYLVANIA.

COAL.

James S. Kuhn *et al.*, of McKeesport, have purchased a coal field near Monongahela City. It contains about 500 acres and fronts on the river.

A coal field of over 500 acres, lying adjacent to Milesville, Pa., on the Monongahela River, it is stated, has been sold to O'Neil & Co. The field includes the old Crombie mines, owned by the Pittsburgh Bank of Commerce, the coal and surface of Zera Hayden's heirs, the coal of Gamble's heirs and James Torrence.

The Schuylkill Coal Exchange has issued a report dated Pottsville, July 1st, which shows that the collieries drawn to return prices of coal sold in month of June, 1891, to determine the rate of wages to be paid, make returns as follows: P. & R. C. & I. Co. Reliance Colliery, \$2.16; Thomaston Colliery, \$2.21; Preston Colliery, No. 3, \$2.24; Kohinoor Colliery, \$2.22; Knickerbocker Colliery, \$2.26. Total, \$11.10. The average of these rates is \$2.22. The rate of wages to be paid for work done during the last two weeks of June and the first two weeks of July, 1891, is nine per cent. below \$2.50 basis.

GREEN RIDGE.—An explosion of gas at this colliery on the 8th inst. ignited the inner workings and fatally burned John Dorsey and John Pickmonti and seriously injured Christopher Shoffstall. At the time of last reports the mine was burning.

SOUTH DAKOTA.

Mr. J. T. Gilmore is developing an asbestos mine in the Central Hills. At first the mineral was brown, brittle, and only available for paint and other low-priced purposes; with increasing depth, however, the quality has steadily improved, until now the face of the drift is in mineral worth, it is said, from \$40 to \$60 per ton.

EAGLE OIL COMPANY.—This company owns about 1,700 acres of land near the Newcastle oil fields, all being taken up as placer claims. Oil has been struck at a depth of 196 ft., but in small quantities.

RAPID CITY OIL COMPANY.—Thirty-five miles west of Sundance, near Wind River, this company has a large tract of land in which the first oil-bearing stratum was struck at a depth of 800 ft. The second stratum, found at a depth of 1,025 ft., was 75 ft. thick. The last oil-bearing rock was struck at a depth of 1,150 ft. and 50 ft. thick; the oil was of the same quality as in the second layer.

LAWRENCE COUNTY.

The Central City Miners' Union, on hearing of wages being cut in this vicinity, sent representative members on the 29th ult. to inform Mr. Cameron, general manager of the Hermit Mining Company, and Mr. J. G. Keith, of the Rainbow mine, that the companies had better close down if they would not maintain the rate of wages that has ruled for the last 12 or 14 years in the district, allowing miners \$3.50 per day, and shovellers \$3, or board and \$2. The Hermit Company complied with the request, but Mr. Keith declined to raise wages without authority from the directors, and agreed to close down the mine.

KEYSTONE CHLORINATION WORKS.—This plant was recently shut down, owing to the delayed arrival of a new screen for the Gates Combination Crusher. Superintendent Cameron is in Chicago purchasing machinery, including a full set of Cornish steel rolls, that will increase the capacity of the plant to 100 tons per day.

MANSFIELD TIN MINING AND MILLING COMPANY.—The *Black Hills Daily Times*, of 28th ult., states that this company, which has been in rather bad odor locally, for reason that the promoters were floating and selling the stock, before the company had acquired title to any property, have at length seen fit to take steps to rectify, in form at least, as far as possible the errors of the past few months. Deeds were placed on record yesterday, by which 21 locations, known as the Taylor lodes, Nos. 1 to 21, were conveyed to the company in consideration of \$10,000, and 24 locations, known as the Deadwood lodes, Nos. 1 to 21, and 26 to 29, were conveyed in consideration of \$20,000. Grantors by the deeds are O. O. Taylor, John Farrell, Oscar Leadin, J. D. Knox, Nels Rosenberg, Harry Olson, William Wolff, John Lanigan, John M. Watson, Ella A. Hanson and Martha Taylor. The property deeded is situated at Bear Gulch in Rawlins tin mining district. None of the location certificates was filed for record at a date earlier than last March. What the company now proposes to do is known as little as the source from which it obtained the \$30,000 to pay for the property.

UTAH.

UTAH COUNTY.

Joseph Wilson, of Provo, recently discovered a large deposit of slate of excellent quality 15 miles southwest of Payson. The location is at present seven miles from a railway, but the Tintic branch of the Rio Grande Western will pass within three miles of it. A company is to be organized to open a quarry.

VERMONT.

RUTLAND COUNTY.

A quarry on Bird Mountain, between West Rutland and Castleton, which has recently been opened, is said to contain a conglomerate granite composed of crystals of different colors. This granite, containing no iron, will not rust. It is said to resemble the stone in the Egyptian pyramids.

WEST VIRGINIA.

The South Penn Oil Company, a branch of the Standard Oil Company, has just completed deals with T. M. Jackson & Co. and other large operators for over 80,000 acres of oil lands in Doddridge County. The same company has also obtained control of the interests of E. M. Hukill in the Mt. Morris field. Nearly \$1,000,000 changed hands in the two deals. The purchase, it is said, gives the Standard Company almost complete control of the oil territory in West Virginia.

WYOMING.

The next state mining convention is to be held at Cheyenne in September 7th to 13th. A large display of minerals and ore samples has already been secured. The Union Pacific, the Burlington, and the Fremont, Elkhorn and Missouri Valley railroads have granted participants a half-fare rate.

FOREIGN MINING NEWS.

BELGIUM.

Cable reports state that the great strike of Belgian miners, which has been in progress for the last 70 days, was brought to an end on the 9th inst. The Council of the Knights of Labor has decided in favor of a general resumption of business.

BRAZIL.

The Governments of Brazil and Bolivia, according to reports, have granted contracts to Mr. George Foster, now of Milford, Pa., and to Mr. John Hurd, of the Adirondack region, N. Y., for the completion of the railroad between those two countries which was begun 15 years ago by Collins Brothers, of Philadelphia, Pa. The contractors obtain concessions for a tract of land the entire length of the road, and ten miles wide on either side of it. The railroad will give a line to the navigable waters of the Madeira River and thence to the Amazon.

BRITISH COLUMBIA.

NELSON, July 2.

HOT SPRINGS DISTRICT.

Near Goat River, which runs into the Kootenai a few miles below the boundary line, some coarse-cube galena and gray copper ore have been found recently. The clean galena (as does the gray copper) carries about 130 ounces silver per ton. Some locations have also been made on copper pyrites, carrying \$10-\$12 per ton in gold and silver.

Among recently organized companies to work properties in the Hot Springs are the Jeanette Mining Company to work the Jeanette claim, with a capital stock of \$500,000, and with J. M. Moore, J. W. Maynard, A. J. White, and E. D. Ainsworth

for directors; also the Fulton Mining Company to develop a claim of the same name; capital stock, \$400,000; directors, J. Van Hook, E. D. Ainsworth, and Henry Burdett.

NELSON DISTRICT.

QUEEN VICTORIA.—The appearance of the claim is improving, there being more mineral in the face of the tunnel than I have seen on any previous occasion. The ore is low grade, but there are indications of large ore deposits in the hill upon which the claim is located.

ROVER CREEK.—Several locations have recently been made on coarse-cube galena near this creek. The clean ore carries from \$175 to \$395 per ton of silver. Quite a number of Coeur d'Alene prospectors are in the district.

WILD CAT.—The 18 ton lot of ore put through the Poorman Mill is said to have yielded \$16.12 per ton in gold. This should be satisfactory, for half the stuff milled was country rock; no attempt was made to save the sulphurets. A contract has been let for 100 feet more tunneling.

BRITISH GUIANA.

In the Conamarok Creek, owned by the Luckie Syndicate, a gold nugget was found on the 12th ult. weighing, according to reports, inclusive of the quartz commingled with the metal, 35 lbs., and estimated to be worth \$5,000.

According to reports from Port of Spain, British Guiana, some time ago Mr. Kaufmann, a mine owner in the gold fields of British Guiana, discovered a diamond mine in which he collected 638 stones, among which only five were found to be of no value, the remaining 633 being genuine diamonds of pure water. The Governor of British Guiana, in a speech at the opening of the legislature, referred to the diamonds as opening up a new source of prosperity for the colony.

CANADA.

PROVINCE OF NOVA SCOTIA.

(From our Special Correspondent.)

A mortgage of \$2,000,000 has been placed by the New York Loan and Trust Company in connection with the construction of a railway from Sydney to Lewisburg and Port Hawkesbury in Cape Breton. This road will afford a cheap and all-winter outlet for a large coal territory hitherto undeveloped.

COAL.

There is little new to report concerning the trade. Work is brisk at all the mines and complaints are heard of the scarcity of coal cutters. The importation by the General Mining Association of the miners from Scotland was not a success, as the men would not settle to work. The restrictions imposed by the local government upon the use of gunpowder in mines giving off gas is causing some trouble, but will probably lead to the adoption of roborite or some allied form of low-temperature explosive. The complaints as to scarcity of coal cutters will be intensified before long, as legislation has been passed requiring all coal cutters to have been employed some time before they can be allowed the picks.

GOLD.

The Lake View Company at Waverley is reported closing down its mill owing to low grade of the ore. The Malaga Mining Company has been doing well lately. The Gays River conglomerate is being given a further test by the Coldstream Mining Company, which has found the slates under the alluvium in places well charged with gold. Generally speaking, gold mining is quiet, and few new finds are reported.

CLAY.

A company has been formed to work a bed of fireclay near New Glasgow, Pictou County. The clay is reported as free from iron and alkali, and to make good fire brick.

IRON.

The new iron works in Pictou County are making good progress and about ten miles of railway are under construction. A valuable bed of spathic ore was recently found on the East River at one of the company's mines, yielding upon roasting 46% iron, and free from phosphorus.

PROVINCE OF ONTARIO.

CANADIAN COPPER COMPANY.—This company, according to reports, is shipping 240 carloads of nickel matte to the United States.

CHINA.

The import of American and Russian kerosene oils at Chinkiang, China, has risen from 1,351,800 gallons of the former, and 530,000 gallons of the latter, to 1,559,180 gallons and 900,350 gallons respectively, and their joint value from \$296,000 in 1889 to \$385,000 in 1890.

ENGLAND.

At a meeting of the Monmouth Coal Owners' Association, held at Cardiff, on the 26th ult., it was resolved to put notices at the pit head of each colliery belonging to the association, on July 1, to the effect that the sliding scale agreement will be terminated Dec. 31, 1891. It was stated at the meet-

ing that this action would affect 70 mining companies, embracing 200 collieries and employing 80,000 men. Under the agreement now to be terminated the miners' wages have been advanced nearly 60%.

It has been determined to develop on a large scale the recent discovery of salt on Walney Island, which is situated within the borough of Barrow. The salt is found within an area of about 10 sq. miles, with a depth of the very best salt varying from 97 ft. to 450 ft. within 100 yds. of the surface. It is proposed to raise every year and manufacture 150,000 tons of salt at Barrow, and the supply is considered by experts to be inexhaustible. It is thought that coal may be discovered underlying the salt deposit.

HONDURAS.

Col. F. F. Hilder, a citizen of the United States now living in Honduras, writes to the Bureau of American Republics that the mining companies of Honduras have already begun to prepare their exhibits for Chicago, and that the display of minerals will surpass anything of the kind that has ever been seen.

MEXICO.

CHIHUAHUA.

The fire which destroyed the extensive plant at the Cusihuiriac mines in April, 1890, burned in the underground workings for a year. The fire communicated with several shafts which had been previously re-timbered, following them down to the old Spanish galleries and tunnels, where, owing to the dryness of the old rotten wood, it burned as in a tinder box. With the burning of the timbers the ground caved badly, and the total loss to the company is estimated at \$2,000,000. The mines filled with water to the tunnel level, which is 700 feet above the bottom of the deepest shaft, and it is estimated that it will take a year to unwater the flooded workings.

NEW SOUTH WALES.

Asbestos has been discovered in a vein measuring from 2 feet to 2½ feet in width at a depth of 10 feet, at Redhill, near Brokenhill. Some of it contains fiber 13 inches long, the texture being silky and flexible. It is not as strong and tough as the Italian asbestos, and its color is different, being of reddish hue. It is thought, however, that whiter mineral will be found with depth.

NORWAY.

HAUGESUND GOLD MINING SYNDICATE.—This corporation did not commence work until August 1st, 1890, owing to scarcity of money. It obtained during the balance of the year 193 tons of quartz, yielding 3,394 grams of gold.

OSCAR GOLD MINING COMPANY, LIMITED.—This company has not worked two of its mines during 1890, and the third was only worked to a moderate extent. This was mainly due to the fact that at the beginning of the year the gold-bearing quartz lode disappeared, being cut off by a mass of diorite. The cost of tracing the lode was considerable. From the principal shaft there were obtained 1,889 tons of quartz, producing 15,93 grams of gold, and from the other shafts 329 tons of quartz, yielding 992 grams of gold. The receipts amounted to 32,146 kroner, and the expenditure to 103,611 kroner.

PERU.

On the western coast, 50 miles from Paytu, an English company has completed 12 oil wells, of which the average production is said to be 125 bbls. per day. The producing sand, which occurs in an average depth of 550 ft., is irregular in appearance, varying from white pebbles as large as a walnut to the regular Bradford, Pa., sand. A refinery has been built, and a crew of Pennsylvania tank builders are engaged in building iron storage tanks. When these are completed operations will be pushed rapidly, as the production, it is said, is only limited because of lack of facilities.

SOUTH AFRICA.

The output of Witwatersrand mines in April was 56,371 ozs. gold, an average of 10'38 dwts. per ton. There were 1,465 stamps, dropping an average of 26'15 days, crushing 98,792 tons of ore, or 2'84 tons per stamp. The output in May was 54,672 ozs., and the total for the first five months of the year has been 267,261 ozs.

The new gold fields of Mashonaland continue to attract attention and a considerable number of adventurers have already started thither. Many valuable reefs have already been located. One of them, at Hartley Hill, on the Umfuli River, is said to be 4 feet in thickness, bearing from 3 to 4 ounces gold per ton. Reports are made of new discoveries in the direction of the Amazoe River and between Fort Victoria and Fort Charter.

Diamonds have been discovered at Christiana, a small village in the Transvaal, about 90 miles from Kimberley. Indications of the existence of diamonds being noticed recently, a regular search was instituted with the result noted. There are now some 60 or 70 prospectors at work, and although they have only reached the depth of 5 ft., the finds are said to have been very satisfactory, stones varying from 14 carats down to small stuff

being quite numerous. They are described as uniformly good in shape and quality, and easily classified. The mine has not yet been surveyed, but a sample of the diamonds found has been forwarded to Pretoria with the object of inducing the government to appoint a mine inspector, to get the ground proclaimed, and to arrange all other preliminaries. Machinery is being ordered by one or two syndicates that have been formed to operate in the new field.

SOUTH AUSTRALIA.

The South Australian Government officially confirms the report that a coal seam, 48 ft. thick, has been cut at Leigh's Creek, near the railway station on the Port Augusta line of railway, at a depth of 1,466 ft. Mr. Cosmo Newbery, Government Analyst of Mines, Victoria, reports that the coal is bituminous. Leigh's Creek is distant from Port Augusta by rail 163½ miles, and from Adelaide 422½ miles.

SPAIN.

It is reported that the iron mines and works belonging to the Pedroso Company have been purchased by an English syndicate for £260,000 besides a large commission. This is considered a very high price. The company possesses land worth about £30,000 and iron works valued at about £25,000; the figure placed on the mines must consequently be about £205,000. The Pedroso was obliged to suspend three years ago, being unable to pay the interest on its debentures.

Coal has been found, according to reports, at Al-banchez, in the province of Almeria, in such a position as to admit of easy working. The discoverer has, however, taken up only a few acres of land, which would make it probable that the discovery is not of great importance. Coal is very dear in the province of Almeria, and the production of even inferior coal would be very advantageous in developing the mining and metallurgical industries of that district.

A company has been formed in Belgium with a capital of £109,200 to work the phosphate mines of Peñafior. A report made to the company states that there are 1,400,000 tons of phosphates in the mines. It is expected that 100,000 tons of phosphates will be obtained annually, out of which 26,400 tons will be of 75% quality. These mines are favorably situated for shipping purposes, being only 53 miles from Seville, and there is a railway through the whole distance with the exception of 6 miles.

LUMBER MATERIAL MARKET.

NEW YORK, Friday Evening, July 10.

The local industrial world is threatened with another strike. It seems that after the recent lumber strike all but six of the lumber handlers which had been employed by George Schuyler & Co., of Harlem, were reinstated. The walking delegates threatened to order strikes on all buildings using the Schuyler lumber as long as the firm refused these six men employment. They have already called out the men working at 105th street and Madison avenue. The Lumber Dealers' Association is waiting for George Schuyler & Co. to make a formal complaint before taking action.

Now that a normal condition of affairs prevails, it can be seen that the six weeks' strike will have the effect of materially curtailing the year's business, as many who contemplated building have postponed such action until the coming of another season. Notwithstanding, operations are reported active, and the market for different materials good. The St. John, New Brunswick, lumber strike, noted in our last issue, has not been in force sufficiently long to affect the local market. However, it promises to be a long one, and in the course of a short time will have a tendency to stiffen the prevailing weak lumber prices, especially those of wide spruce, which article is obtained almost exclusively from this source.

Brick.—There has been a decline in prices owing to the surplus of stock on the market, and the expressed willingness to buy at concessions. There have been more sales during the week than during any previous week since the strike. The stocks are coming forward just as rapidly as they are going into second hands. We quote nominally: Up River's, \$4@5; Haverstraws, \$4.50@5.

Lime.—The stock in first hands is almost bare, and arrivals are light, with a very small tonnage in sight. There seems to be manifest a well defined effort on the part of burners to force up prices. Considerable stock in second hands serves to supply the immediate wants of the trade. Unless shipments are resumed inside of another week there will be a marked stringency. Quotations, which are merely nominal, are: Rockland, 90c.@\$1; St. John, 80@85c.; State, 75@80c.

Cement.—The market is quiet. There is manifest but little inclination to purchase goods. We quote 90c.@\$1.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, July 10.

Heavy Chemicals.—The second half of the year opens under fairly favorable conditions. The spot business, which has been steadily falling off since the closing of the glass-factories, is now very

quiet. Transactions in futures, however, are of considerable volume. Stocks of the different chemicals are light, although, with the exception of bleach, they are sufficient to meet all demands of the trade. Prices remain about as last quoted.

Caustic Soda, 60%.—The volume of business is light at 3'25@3'32½c. 70% to 74%. Stocks are light and in strong hands. A lack of demand keeps the price at the figure last quoted, viz.: 3'05@3'07½c. 77%. In fair stock, and very little doing at 3'05@3'10c.

Caustic Soda Ash.—The demand is light. There is to be noted a few transactions in futures. We quote 1'55@1'60c.

Alkali, 48%.—We quote a light demand in futures and but little spot business. B. M. is selling at 1'55@1'60c. High-test B. M. is traded in on a limited way, both in spot and futures, at 1'42½@1'45c.

Sal Soda.—There is a limited trade at 1'05@1'07½c. Stocks are ample, and are pressing for sale.

Bleaching Soda.—We again chronicle a market bare of stock and a brisk demand. Spot is firm at 1'80@1'85c. There is some inquiry for futures at 1'75c.

Acids.—The market is reported moderately active. Prices remain unchanged. The business in the heavier acids, particularly sulphuric, is mostly spot. Manufacturers are not disposed to contract for future deliveries. In fact there seems to be a well-defined feeling in the trade that higher prices will rule. There has been no recent movement in this direction, although now that the acidmakers' committee has practically announced that it cannot determine upon a plan it is probable that another movement, having for its object the elimination of ruinous competition, will be started. As one dealer remarked, "The trade has grown thoroughly sick of working for nothing."

Acetic Acid has advanced 15c., and is quoted at 1'65@1'75c. per 100 pounds in New York. We repeat our quotations of last week. Acid per 100 pounds in New York and vicinity: alum, 1'55@1'75c.; muriatic, 18', 80c.@\$1; muriatic, 20', 90c.@\$1.10; muriatic, 22', \$1@1.20; nitric, 40', is selling for \$4.50, and from that upward according to quality, etc.; nitric, 42', \$5@6; oxalic, 7½@7½c.; sulphuric, 60', 75c.@\$1; sulphuric, 66', 85c.@\$1; tartaric, 33@34c.

Brimstone continues on its downward course at a rapid pace. The market is still unwilling to supply spot goods at ruling quotations, although there is considerable on hand which was purchased at a fancy price. \$24 rules for spot, \$22.25 for seconds and \$21.50 for thirds.

Blue Vitriol.—The trade is in a generally demoralized condition. Now that the Paris-green industry is well advanced upon its season, and has shown that it has stock enough on hand to practically carry it into next year, the demand for blue vitriol has fallen off in a marked degree. The effect of the 1,000-bbl. lot placed on the market by Omaha manufacturers has had a tendency to keep the price down to 3½c. Large lots of good quality can be purchased to-day below this figure.

Fertilizers.—The week under review has been exceptionally quiet owing to the "Fourth." Inquiries continue to be made, while spot business is very light.

South Carolina Phosphate Rock continues in good request at sustained prices. We quote for land rock \$7@8, wet and dry respectively, f. o. b. vessels at mines, and \$7.25@8.25 f. o. b. cars. There is but little high grade river rock in the market. Low grades taken from marshes are selling at about \$7.25.

Florida Phosphate Rock.—There is little of this product coming into the local market. That which is being mined goes to Europe. The Place River Phosphate Company is running about 200 tons per day.

Sulphate of Ammonia.—A trifle weaker. Arrivals have been plenty, and the demand is light; 3'05@3'10c. is quoted. The same is true of bone sulphate at 3'02½@3'05c. Dried Blood is weak at 1'95@2c. There is no great activity in Tankage at \$19@21.

Azotine.—Sales have been made at 1'90@1'95c. for July delivery. The market in bone meal is not very brisk at \$22.50@23.50; raw, \$24@25.

Fish Scrap.—The season has just opened and bids fair to be marked by an active trade; \$21.50@22.50 is quoted. Wet acidulated fish scrap is held at \$11.50 per ton. Double manure salt is in good request for fall shipments. We quote the syndicate price of 1'10@1'12c. for 48%. For 90% to 95% basis 90% foreign invoice, weights and lists 2'07@2'10c. Lots under 50 tons proportionately higher.

Kainit. Quiet, at \$9.75@10 to Southern ports; less to Northern ports.

Muriate of Potash.—Arrivals during the week, 300 tons, all of which has gone into consumption. Sales for the week, 100 tons. Syndicate's price per 100 pounds, basis of 80%, \$1.77½ for spot and to arrive. Lots under 50 tons proportionately higher.

Nitrate of Soda.—This market has weakened. The high price which has prevailed during the past few months was caused by the feeling that it would be next to impossible to receive stock from Chili. Now that it has been demonstrated that, no matter which party is in power in that country, stock will be obtainable, there has been a material

reaction. Prices are 1'97½c. for spot and 1'85c. for August delivery. No arrivals. Sales 600 bags.

The official figures of the phosphate fertilizer business of South Carolina for the period between September 1st, 1890, and May 31st, 1891, have just been issued. During that period 278,456 tons of fertilizers have been handled, representing a cash value of \$4,175,500. The respective figures for the season of 1889-'90 were 255,909 tons and \$3,850,000. During the past season all the companies engaged in the manufacture and sale of the fertilizer have made profits ranging from 25% to 40% on the capital stock. There are now 18 phosphate companies doing business in and around Charleston. During the past year three new companies have been formed, with capital aggregating nearly \$1,000,000. The companies alone have a capacity of 175,000 tons. In addition to this there are over 20 cottonseed-oil mills in the State doing an immense fertilizer business. The figures given have no reference to the mining of rock, but only to manufactured fertilizers.

Liverpool.

June 29.

(Special Correspondence by G. G. Blackwell.)

Minerals.—There has been a fair business during the past week and prices remain firm. Magnesite: Stocks large; prices continue very flat. Raw ground £6 10s., and calcined £12 10s. Bauxite (Irish Hill brand) in very strong demand at full prices; first lump, 20s.; seconds, 16s., and thirds, 12s. Barytes: Carbonate easier, while sulphate of fine quality is scarce, bringing full prices. "Angel White," No. 1, 70s.; No. 2, 60s.@65s.; No. 3, 45s. Pumicestone: Picked lump quieter; ground, more doing. Iron ore easier, also man-ganiferous and Santander; Irish and Cumberland in demand at full prices. Emerystone: Best brands continue in demand at full figures. No. 1, lump, £5 10s.@£6; smalls, £5@5 10s. Fullers earth unchanged; best lump, 55s.; fine impalpable ground, £7; "Emerald" ground, 80s. Chrome ore: High grades in demand at full prices. Asbestos firm, especially for Canadian rock. Plumbago: Best qualities sought for; Spanish, £6; best Ceylon lump at last quotations; Italian and Bohemian, £4@£12 per ton. "Founders," £5@£6; Blackwell's "Mineraline," £10. Ground mica, £50. China clay steady; common, 18s. 6d.; good medium, 22s. 6d.@25s.; best, 30s.@35s. (at Runcorn).

Chemicals.—A steady business has been done this week, and prices have ruled firm. Soda ash, £5 2s. 6d. up. Caustic soda firm; 60% white, £9 15s.; 60% cream, £9 10s., and 70% white, £11 10s.; 74%, £12. Bicarbonate, £5 15s. Nitrate of soda, 8s. 6d.@9s. Soda crystals, £3 10s. Bleaching powder, £7. Salt cake, £42s. 6d. Chlorate of potash, 5½d. Arsenic, £13 10s. Sulphate of copper, £18 10s.@£19. Manganese: Sulphate, £22; chloride of manganese, £15 per ton; carbonate, £12 10s.; borate, best English make, 6½d.; oxalate, 1s. 6d. Chloride of magnesium (antiseptic), strong at 45@50s. Montreal ashes: Pot, 32s.; pearl, 45@47s.

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

Since our last our market for heavy chemicals has been quieter, and the amount of business done during the past week much smaller. Quotations remain the same. It is rumored that the United Alkali Company will stop one or more of its works in order to sustain quotations by preventing an undue accumulation of stocks.

Soda Ash.—Quotations are as follows: Caustic ash, 48%, £5 2s. 6d. per ton; 58%, £6 4s. per ton. Carb. ash, 48%, £5 7s. 6d. per ton; 58%, £6 10s. per ton—all net cash. A premium on above quotations is demanded for prime brands.

Soda crystals firm at £3 5s.@£3 7s. 6d. per ton net cash.

Caustic soda steady, and quotations are without change as follows: 60%, £9 10s.@£9 15s. per ton; 70%, £10 15s.@£11 per ton; 74%, £11 15s.@£12 per ton; 76%, £13@£13 5s., all net cash.

Bleaching powder is still held for £7 per ton net cash.

Chlorate of potash in small compass at 5½d. per lb., less 5%.

Bicarb. soda in request and firm at £6 15s.@£7 per ton, less 2½%, for 1-cwt. kegs, according to brand and quantity, with usual allowances for larger packages.

Sulphate of ammonia dull, and good grey 24% in double bags is quoted at £11@£11 2s. 6d. per ton, and 25% in double bags £11 5s.@£11 7s. 6d. per ton, less 2½% f. o. b. Liverpool.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Baltimore, Denver, Kansas City, Birmingham, Ala., Pittsburg, St. Louis, London and Paris, see pages 62 & 64.]

NEW YORK, Friday Evening, July 10.

The mining market for the week under review seems to have passed from inactivity to innocuous desuetude. The prices generally have not declined, possibly for the reason that they are about as low as they can be. The trading is of a smattering nature, consisting of forced sales and the picking up of odd lots. There has been manifest a little inquiry in certain directions, but at bids so ridiculously low that they have not been considered. General financial inactivity of the country is ascribed as responsible.

The Comstocks seem to have reached bed rock prices. Transactions, although much less in vol-

ume than for several weeks, were generally sus- tained. In some cases there was a light advance.

The sales for the week were 31,800 shares. Of this number 7,300 were of dividend-paying stock. The sales for the corresponding period in 1890 were 63,488 shares. A curtailment of one day in the week's transactions is in a measure responsible for the small volume of business. Bulwer sold in a limited way on Thursday and Friday at 50c. and 55c., the latter price being the closing. On the last call to-day 60c. was bid. Consolidated California & Virginia, on limited sales, rather led the San Francisco exchange. Transactions occurred at \$6.75 to \$7. On the last call to-day, \$6.25 was bid, the same being the purchasing price this morning on the San Francisco board. Crown Point, from the closing of last week of \$1.45, sold yesterday at the same figure; reacting, it was recorded to day at \$1.30; on the last call \$1.10 was bid, with no offers. A small lot of Gould & Curry sold on Wednesday at \$1.50; it closed decidedly weak. Navajo was traded in to the extent of 700 shares at 30c. On to-day's call it was in considerable request, and closed quite strong at 26c. bid and 33c. asked. There was considerable pressure to sell Ophir. Small lots were bid at \$3.15 to \$3.25, the latter figure being recorded on the last sale. On the last call to-day \$3 was bid. Savage was traded in to a limited extent at \$1.80 up to-day, when it sold to \$1.75. It did not manifest much strength, but closed weak at \$1.60 bid. Sierra Nevada from the closing last week of \$2.25 rallied to \$2.30, at which figure sales to the extent of 200 shares changed hands. Yellow Jacket was in less demand than it has been for some weeks, selling to \$2 against the previous week's closing of \$1.80. Alta opened Monday at 80c., its previous week's closing. One subsequent sale brought it up to 90c. It was in little demand. Best & Belcher was in fair demand during part of the week, selling on Wednesday at \$2.50, and dropping to \$2.40 on subsequent sales. It closed the week at \$2 bid. Chollar was inquired for to some extent, and 400 shares of stock brought out were above values of the previous week. The first sales were made at \$1.90, and later sales at \$2 and \$2.15. Comstock Tunnel experienced another week of almost total inactivity; 100 shares changed hands at 19c. The bonds and scrip were not traded in. On the last call to-day the stock was bid at 18c. and held at 20c.; bonds were bid at 40% with no takers, and the scrip held at 30% with no takers. Mexican, from last week's closing of \$2.15, made one sale early in the week at \$2.35. It was in little demand, and on the last call was offered for \$2. Occidental enjoyed a period of moderate activity, maintaining its last week's quotation of \$1.15, on sales of 700 shares. It was inquired for to a limited extent, and was bid \$1 to-day on the last call. Sutro Tunnel seemed to be in more or less demand throughout the week at 5c. Sales of 4,100 shares occurred on Monday at 7c. and 8c. An odd lot of Utah sold Thursday at 70c., against last week's closing of 85c. A 100-share lot of Potosi sold to-day at \$4.60, against \$3.50 June 26th.

Of the Colorado stocks Bassick was traded in to the extent of 300 shares at 10c. against last week's price of 11c. Little Chief was in some request to-day for the first time in several weeks, at 26c. bid and 30c. asked. Sales to the extent of 400 shares at 28c. are recorded. Robinson Consolidated was sold on Wednesday at 50c. The selling price May 7th was 60c. Small Hopes was in some little demand, and sold to-day at 75c. Phoenix Lead was inquired for quite actively to-day, and sales took place at 13c. and 14c. Sullivan Consolidated was traded in to the extent of 400 shares at 40c. Of the stocks in which transactions did not take place, \$1.80 was bid for Adams on the last call; Aspen closed at \$2 bid and \$4 asked; Iron Silver \$1 bid; Leadville Consolidated, 8c. bid and 11c. asked. Silver Cord was in quite good demand to-day, 1,200 shares selling at 25c. and 20c. On the last call 20c. was bid and 30c. asked.

California Stocks.—Astoria, as usual, was active at 1c. and 2c., selling to the extent of 5,500 shares. Belmont continued its upward career, reaching 75c., against last week's closing of 71c. On the last call it was bid 74c. and offered at 75c. Brunswick continued weak, and to some extent was pressed for sale. Transactions to the extent of 2,200 shares took place at 8c. and 9c. On the last call it was bid at 8c., with no takers. Emmett Consolidated may be considered as a new departure in the market. Although it has been listed for some time it received its first important transactions this week. It is rumored that a movement is on foot among western stockholders to gather in all of the floating stock. It was bought at 55c., 60c. and 65c. On the last call it was 60c. bid and 65c. asked.

Plymouth continued to lose the ground gained four weeks ago on the strength of its financial statement. From the last week's closing of \$2.90 it sold on Wednesday at \$2.95. On the last call to-day \$1.75 bid and \$2.50 was asked. Middle Bar has descended to a 1c. standard. There does not seem to be any demand for the stock, and sales, although insignificant, may be said to have been forced. Standard was quite active during the week, selling between the figures of 90c. and \$1.15 to the extent of 950 shares. It closed fairly firm at \$1 asked. Of the stock not traded in we note 75c. bid for Bodie, 45c. for Mono. Horn Silver continued to lose ground without any apparent reason. It sold 675 shares at \$3.15

@\$3.20. It was in quite good demand at the former figure, being called for to day, but was not brought out. Ten shares of Ontario were sold on Monday at \$40. It closed at \$38 bid and \$40 asked.

Deadwood was in considerable request; 200 shares were brought out at \$1.25. It closes quite strong at \$1.20 bid, and \$1.30 asked. On the last call to-day \$1.25 was bid. Homestake was quite freely inquired for at \$11. No stock was brought out. Iron Hill entered the market to-day after a protracted absence, selling at 16@17c.

Mutual Smelting and Mining suffered a marked decline. From last week's closing of \$1.40, it sold off to 90@95c. On the last call to-day \$1 was bid.

Alice was in considerable request, but very little of the stock was brought out; 200 shares sold on Monday at \$1.65. On the closing to-day \$1.50 was bid, and \$1.75 asked.

Boston. July 9.

(From our Special Correspondent.)

The market for copper stocks has shown a little more activity since the Fourth of July, and for a day or two it looked as if there was to be an improvement both in the volume of business and prices. So far, however, it has not developed into any well-defined movement, although there is noted a hardening tendency and rather more inquiry for the dividend-paying stocks. The Montana mines seem to be the favorites at present, and any sustained effort would very likely result in a higher level of prices for these specialties.

Calumet & Hecla, after selling at \$263 last week, dropped off to \$259. It subsequently recovered to \$284, and sold yesterday at \$260.

Tamarack sold, ex-dividend, this week at \$250, then up to \$154, and back again to \$152. Franklin sold in a small way at \$16 1/2, ex-dividend, and for round lots at \$16.

Boston & Montana advanced on good buying orders from \$44 1/2 to \$43 1/2, but lost a portion of the advance, selling to-day at \$45 1/2. Butte & Boston was the most active stock on the list, with sales of over 2,000 shares, advancing from \$15 to \$16, with latest sales at \$15 1/2. Affairs at the mine are reported to be assuming a much more favorable aspect, and its friends confidently predict that it will soon be on a dividend-paying basis.

Quincy touched \$112, with reaction to \$108 for small lots. Centennial sold up to \$15 1/2, but later declined to \$14 1/2. Osceola has been very quiet, only 100 shares changing hands at \$37 1/2 @ \$38. A small lot of Kearsarge sold at \$12, a decline of \$1 from last sale. Alouez was weak and declined to \$2 1/2 after selling at \$3 1/2. The fear of another assessment in the near future has a tendency to keep the stock weak.

Santa Fé sold at 50c., as also did Bonanza. The silver stocks continue to rule quiet. Cœur d'Alene sold at \$1 1/2, the same price as last week. Sale of Napa quicksilver were made at \$4.

P. M.—Calmnet & Hecla declined to \$255; Quincy to \$152; Butte & Boston firm at \$15 1/2 @ \$15 1/2, and Boston & Montana unchanged.

Lake Superior Iron, Gold and Silver Stock.

(Special Report by A. M. Helmer, Milwaukee, Wis.)

Iron.		Milwaukee Iron Co.	
GOGEBIC RANGE:			\$5.00
Anvil	\$3.50	Negaunee	.....
Ashland	51.00	Pitaburg and Lake	.....
Aurora	9.25	Republic	142.00
Bessemer Consoli- dated Bonds	20%	Riverside	30.00
Brotherton	2.50	MENOMINEE RANGE:	
Cary	.....	Aragon	.....
Colby	.....	Chapin	.....
Father Hennepin	.....	Commonwealth	10.50
Germany	9.00	Florence	.....
Gogebic Iron Syndi- cate	.25	Hamilton Ore Co.	.....
Iron Belt	1.50	Lincoln	2.00
Metropolitan Land and Iron Co.	60.00	Mansfield	.....
Montreal	10.50	Mastodon	.....
Northern Pabst	2.25	Metropolitan	60.00
Northern Chief	30.00	Montfor	.....
Odanah	13.50	Norway	.....
Pabst	.....	Paint River	.....
Palm	1.75	Pewabic	.....
Pence	1.50	Quinnese	.....
Penokee and Goge- bic Develop. Co.	.....	Sheldon and Shafer	.....
Ruby	.....	Sheridan	5.00
Ryan	.35	Vulcan	.....
Section 33	13.50	Youngstown	.....
Windsor	.....	VERMILION RANGE:	
Wisconsin Iron and Steel Co.	.60	Chandler	37.00
MARQUETTE RANGE:		Chicago and Minne- sota Ore Co.	100.00
American	\$2.25	Clingstone	.25
Champion	78.00	Inter Ocean	.25
Cleveland	16.50	Minnesota Ore Co.	70.00
Cleveland Cliff Iron Co.	.....	Pioncer	.....
East New York	2.00	Vermilion	.....
Humboldt	.....	Vermilion P. H. & L. Co.	.25
Iron Cliffs	.....	Gold and Silver.	
Jackson	104.00	Badger Silver Min- ing	3.00
Lake Superior	56.00	Michigan Gold Co.	.30
MARQUETTE RANGE:		Peninsula Gold Min- ing Co.	.....
Michigamme	.....	Ropes Gold and Sil- ver Co.	1.75

San Francisco. July 2.

(From our Special Correspondent.)

To-day the stock boards adjourned for the usual summer vacation, and as the market has been in more or less of a stagnating condition during the past week no one will suffer by a temporary suspension of business. At the close yesterday the market was slightly stronger, but trading was dull.

Consolidated California & Virginia has continued to scale downward as the battery assays have continued to decline. The lowest point touched during the week was \$5.87 1/2, the stock selling at \$6 1/2 yesterday. The fluctuations in Consolidated California & Virginia throughout the half year that has now ended have been large. In January the extreme prices were \$2 and \$4.85; in February, \$4.40 and \$6 3/4. A decided advance took place in March when the price rose from \$6.50 to \$13 7/8, declining to \$11.75. In the first part of April the stock again rose and sold for \$15.25 on the 30th. The culmination in value was attained on May 5th, when \$20.50 was paid. Since then the price has steadily declined, notwithstanding an increased bullion yield.

Ophir closed this week at \$3.25; Sierra Nevada at \$2.20, and Mexican at \$2.20, with small sales.

In the middle group of Con-stocks the sales have been light. Best & Belcher has been selling for \$2.4; Chollar, \$1.80; Potosi, \$3.75, and Savage, \$1.6.

In the Gold Hill stocks business has been more active. Bullion ruled steady at \$2.35; Overman, \$2.20, and Occidental, \$1.15.

The Tuscarora stocks continue to rule very low. Commonwealth has sold for 65c.; Nevada Queen, 25c.; North Commonwealth, 50c., and N. Belle Isle, 50c.

Sales of Bodie & Quijotoa, as well as other outside stocks, have been merely nominal.

By Telegraph.—Following are given the opening quotations on the San Francisco stock exchange, Friday, July 10th: Alta, 80c.; Best & Belcher, \$2.25; Belle Isle, 75c.; Bodie, 85c.; Bulwer, 55c.; Consolidated California and Virginia, \$6.50; Chollar, \$1.90; Crown Point, \$1.15; Commonwealth, 60c.; Eureka Consolidated, \$3.25; Gould & Curry, \$1.40; Hale & Norcross, \$1.75; Mexican, \$2.10; Mono, 50c.; Navajo, 25c.; North Belle Isle, 50c.; Nevada Queen, 30c.; Ophir, \$3; Potosi, \$1.40; Savage, \$1.55; Sierra Nevada, \$2.10; Union Consolidated, \$2; Utah, 65c.; Yellow Jacket, \$1.60.

* Thursday's closing quotations.

Salt Lake City.

Prices and sales for the week ending July 4, 1891.

Name and Location of Company.	Open- ing.	High- est.	Low- est.	Clos- ing.	Sales.
Alice, Mont.	1.55	1.55	1.25	1.55	.....
Alliance, Utah	.....	.....	.....	.....	.....
Anchor, Utah	5.25	5.25	5.00	5.25	.....
Apex, Utah	.15	.16	.15	.15	7,000
Barnes Sulphur, Utah	.....	.....	.....	.....	.....
Big Hole Placer, Mont.	.17	.25	.11	.25	500
Centennial Eureka, Utah	51.00	51.00	51.00	51.00	.....
Congo, Utah	.16 1/2	.19	.12	.19	20,500
Crescent, Utah	.55	.60	.50	.55	1,500
Daly, Utah	19.75	20.00	19.50	20.00	.....
Glencoe, Utah	5.50	6.00	5.50	6.00	.....
Horn Silver, Utah	3.40	3.40	3.20	3.35	300
Malad Con., Idaho	.03 1/2	.03 1/2	.02 1/2	.02 1/2	9,000
Mammoth, Utah	2.25	2.65	2.25	2.50	.....
North Eureka, Utah	.10 1/2	.11	.10	.10 1/2	5,250
Northern Spy, Utah	.....	.....	.....	.....	.....
Ontario, Utah	39.00	39.00	39.00	39.00	.....
Stanley, Utah	.10	.10	.05	.07	13,000
Utah L. & C. Co., Utah	.....	.....	.....	.....	.....
Utah Oil Co., Utah	.....	.....	.....	.....	.....
Woodside, Utah	.....	.....	.....	.....	.....
Total sales	.....				57,050

St. Louis. July 8.

(From our Special Correspondent.)

With the exception of a few large sales mining matters are somewhat dull, and on this account the Exchange has decided to adjourn its afternoon sessions until September 1st.

The Little Albert meeting, called to raise money on the treasury stock, proved as much a failure as the meeting two weeks ago. Seeing that nothing could be gained by calling meetings, the directors decided to appoint a committee to solicit subscriptions.

Granite Mountain continues to fall off in value. This week it has dropped from \$20.75 to \$19.75. A semi-official report shows that after paying its present dividend and paying accounts in Montana it will have a surplus in the treasury of \$360,000. Its weekly shipment amounted to 44 bars containing of silver 59,787 ounces and 85 ounces of gold. The stock was bid at the opening at \$20.75, but later fell to \$20.25, and then to \$20, with 170 shares sold. On Monday 50 shares sold at \$20 and on the following day 30 shares at the same price. To-day the stock closes at \$19.75.

Montrose opened at 60c. with a sale of 400 shares; later the stock fell to 35c., with no sales, closing at that figure.

Pat Murphy came to the surface again this week and a big block of it was sold at 5c., 10,000 shares going at that figure. Immediately after the sale, however, the stock fell first to 4c. and then to 3c. To-day it did not have a bid.

Nellie was another stock revived, a bid of 4c. being made on 5,000 shares. No sales were made.

American & Nettie fell off during the week. On Thursday 100 shares sold at 35c., though on the same day the stock fell to 28 1/2c. To-day the stock is weak at 25c.

Yuma still continues to keep up in figure, and to an opening bid of 75c. is now quoted at 76 1/4c. Only one sale of 400 shares at 77 1/2c. was made.

Little Albert continues weak at 2c. During the week 1,500 shares sold at 3c.

Although the trading in Elizabeth was not up to

the usual amount, still the stock advanced considerably over opening values and is now in good demand. The stock opened at \$1.77½, and 200 shares sold at that figure. On Monday a good report was received from the mine and the stock rapidly advanced to \$1.95, four hundred shares selling at \$1.85@1.95. To-day the stock is quoted at \$1.85.

Breen was on the market only a part of the week and only one sale of 100 shares was made. The opening bid was 50c., a sale at that figure being made; later the stock fell to 48¾c.

Silver Age managed to improve its price somewhat, though the amount of business done was very small. From \$1 the stock rose on Tuesday to \$1.25, when a sale of 50 shares was made. To-day's quotation is \$1.10.

Aztec declined from 9c. to 5c. on a weak demand.

MEETINGS.

Union Consolidated Silver Mining Company, at the office of the company, Room 11, No. 303 California street, San Francisco, Cal., July 20th, at 1 P. M.

DIVIDENDS.

Granite Mountain Mining dividend, No. 78, of 25 cents per share, \$100,000, payable on and after July 10th, at the office of the company, Room 123, Laclade Building, St. Louis, Mo.

Parrot Silver and Copper Company, dividend No. 34, of 10 cents per share, payable July 20th. Also, an extra dividend of 10% on the capital stock of the company, aggregating \$180,000, is payable on the same date.

Tennessee Coal, Iron and Railroad Company, dividend of 4% on the preferred stock, payable July 15th, at the Fourth National Bank, New York City.

ASSESSMENTS.

COMPANY.	No.	When levied.	D't'ng't in office.	Day of sale.	Am't. per share.
Best & Belcher, Nev.	49	June 23	July 28	Aug. 18	.50
Clara, S. Dak.	4	June 2	July 20	Aug. 15	.25
Goodman, Nevada.	10	June 2	July 4	Aug. 6	.05
Himalaya, Utah.	9	May 27	June 27	July 27	.0046
Inyo Marble, Nev.	13	May 23	July 10	July 28	.10
Navajo, Nev.	21	May 20	June 25	July 17	.20
Northwestern G. & S., B. C.	3	June 18	July 31	Aug. 24	.08
Peer, Ariz.	10	May 29	July 3	July 23	.10
Piedmont, Nev.	2	May 21	June 30	July 22	.05
Sag. B. & Midas, Nev.	8	June 16	July 20	Aug. 10	.25
Silver King, Ariz.	6	May 20	June 29	July 28	.20
Teresa, Mex.	4	June 8	July 11	July 29	.30
Union Con., Nev.	43	May 15	June 22	July 13	.30
Wood River, Idaho.	2	June 12	July 13	Aug. 10	.0046

PIPE LINE CERTIFICATES.

(Specially report by Messrs. WATSON & GIBSON.)

The market for National Transit certificates has been bare of any feature during the past week. It still seems to be the disposition of those who can infuse activity into it, should they so desire, to let it severely alone. As a consequence Pennsylvania and Ohio crude have recorded slight variation in price. There is no doubt that Ohio oil is being most successfully treated and is now freely used as an illuminating fluid, and that the serious objection which has interfered with its consumption, namely its odor, has been largely overcome.

CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

July	4	6	7	8	9	10	Sales.
Opening.	67¼	67½	67½	67½	67½	67½	13,000
Highest.	68	68¼	68	68½	68½	68½	23,000
Lowest.	67¼	67¼	67¼	67½	67½	67½	33,000
Closing.	67½	67¼	67¼	67¼	67¼	67¼	11,000
	68	68	68	68	68	68	8,000
Total sales in barrels.....							88,000

NEW YORK STOCK EXCHANGE.

July	4	6	7	8	9	10	Sales.
Opening.	65	65	65	65	65	65	2,000
Highest.	65	65	65	65	65	65	2,000
Lowest.	65	65	65	65	65	65	2,000
Closing.	65	65	65	65	65	65	2,000
Total sales in barrels.....							2,000

COAL TRADE REVIEW.

NEW YORK, Friday Evening, July 10.

STATEMENT of shipments of anthracite coal (approximated) for the week ending July 4th, 1891, compared with corresponding period last year.

Regions.	July 4, 1891.	July 5, 1890.	Difference.
Wyoming Region. Tons	409,910	305,463	Inc. 104,477
Lehigh Region "	117,076	106,381	Inc. 10,695
Schuylkill Region "	225,743	182,282	Inc. 43,461
Total..... Tons	752,729	594,126	Inc. 158,603
Total for year to date Tons	18,371,966	15,816,036	Inc. 2,555,930

PRODUCTION OF BITUMINOUS COAL for week ending July 4th, and year from January 1st:

	1891.		1890.
	Week.	Year.	
EASTERN AND NORTHERN SHIPMENTS.			
Phila. & Erie R.R.	979	52,354	67,129
Cumberland, Md.	73,748	2,125,454	1,847,540
Barclay, Pa.	4,176	92,557	73,700
Broad Top, Pa.	7,012	255,279	264,243
Clearfield, Pa.	61,854	2,081,543	1,976,957
Allegheny, Pa.	13,347	666,082	681,182
Beach Creek, Pa.	43,176	1,180,897	948,323
Pocahontas Flat Top.	33,072	1,251,529	962,543
Kanawha, W. Va.	45,785	1,192,772	1,058,303
Total.....	283,149	8,898,467	7,879,911
WESTERN SHIPMENTS.			
Pittsburg, Pa.	14,462	530,273	449,742
Westmoreland, Pa.	25,835	916,956	721,891
Monongahela, Pa.	8,723	295,936	205,283
Total.....	49,020	1,707,165	1,376,926
Grand total.....	332,229	10,605,632	9,256,837

PRODUCTION OF COKE on line on Pennsylvania R. R., for the week ending July 4th, 1891, and year from January 1st, in tons of 2,000 lbs.: Week, 91,814 tons, year, 1,728,392 tons; to corresponding date in 1890, 2,760,565 tons.

Anthracite.

The production for the week ending July 4th was 752,729 tons, against a production of 880,485 tons for the week previous. While a reduction of 130,726 tons in a week makes an excellent showing toward carrying out the policy outlined for July, it should be remembered that no very great effort on the part of the companies was required to bring it about, as they had one less working day—the "Fourth"—in which to operate.

In the trade a midsummer dullness prevails. There is an exceedingly small amount of business doing, and for this reason it is difficult to determine just what is a current price. The almost universal answer to the question, "What circular rules?" is "We are selling no coal." There is no doubt that deliveries are still being made upon June rates, and that they will continue until the 15th inst. Companies generally claim that they are meeting the few bids offering with the statement that they are holding to the new circular. The retailer or heavy consumer is occasionally to be found in the market. His offers to purchase, however, are based upon a circular which preceded the present one.

There is the usual tonnage of coal being moved. We learn from local agents that the Chicago situation is anything but stable.

The case of the Interstate Commerce Commission vs. the Lehigh Valley Railroad Company, in which the plaintiff seeks to compel a compliance with its mandate issued in the case in which Cox & Co. were plaintiffs against the same defendant, has been postponed by mutual consent until fall. Meanwhile shippers will continue to pay the scheduled tolls to the Lehigh Valley under protest. The trade several months ago gave up speculating upon the effect that the outcome in this case would have on the market, and the postponement is now received with more or less indifference.

Bituminous.

The market is one of remarkable evenness. In fact, it now looks as if the bituminous coal trade is destined to pass through the dull months of the year without even as much as a ripple of adversity to disturb its serenity. A large tonnage continues to come forward. Prices are the same, and the future is one of considerable promise. Ocean freights for large vessels are very weak. We quote from Philadelphia to Boston, 70c@75c.; Providence, 70c.; Portsmouth, 75c@80c.; Portland, 70c. for large vessels. Small vessels are very scarce and in great demand. Baltimore rates are 5c. higher. Small vessels are very scarce, and in brisk demand.

NOTES OF THE WEEK.

It is said that the New Jersey Coal Exchange will raise the price of coal 25 cents to \$5.25 per ton on domestic sizes, August 1st.

The operations of the Upper Monongahela coke region for the week ending the 20th ult. show 549 ovens in blast and 98 idle ovens. The product was 4,085 tons.

The large storage coal bin of the Housatonic Railroad Company, situated on the water front at Bridgeport, Conn., collapsed on the 6th inst. Its contents of about 2,000 tons of coal sank into the harbor.

A report comes from Clearfield County, Pa., that a party of surveyors, in the interest of the Beach Creek Railroad Company—a side issue of the New York Central & Hudson River R. R.—is running a line from Ansonville to Ervona, a distance of 7 miles, for the purpose of making a connection with the Cresson & Clearfield Railroad. This latter line is a feeder of the Pennsylvania.

A Chicago dispatch says that a conference was held in that city on the 3d instant between the general managers of the Western roads and a committee of coal shippers, in regard to the adjustment of rates on anthracite coal. It appears that last month consignments of coal aggregating 15,000 tons, forwarded from Toledo to Omaha, were routed by way of St. Louis and over the Missouri

Pacific road. The opinion prevails that the Missouri Pacific could not have secured all this business without cutting the rates. Chicago shippers are uneasy in consequence, and are urging the roads leading westward from Chicago to reduce the rate on hard coal in order that they may meet competition. The conference did not result in any action by the managers, but the Missouri Pacific coal deal will be investigated.

Boston. July 9.

(From our Special Correspondent.)

The anthracite situation continues steady and quiet. Coal is coming forward at a good pace, and agents find that their only business consists in caring for old orders. The advance in prices for July has made very little impression on the market. It is yet a little early to judge of its effect. Nevertheless, dealers are slow to believe that it will serve to start the demand any sooner. There is little hope of securing this advance at present, and in most cases agents are content with orders at June figures. The trade does not anticipate any marked change for some few weeks. Agents are conscious of the fact that it is purely a buyer's market. The sales reported to have been made at May prices are not credited. With the assistance of the curtailed production dealers hope to be able to work the market into better shape for the fall trade.

The bituminous market hangs in the same old rut and presents about the same features. Stock is offering freely in all directions, for which there are but few takers. An increased demand is looked for during the next month.

Freights have not moved any to speak of since our last report. Tonnage offers freely, for which there is a fair call. The delay in loading at some shipping points is reported firesome. From New York 60@65c. is quoted; from Philadelphia 75@80c., and from Baltimore 80@90c.

The retail demand remains quiet. Spot stocks here are large, and dealers are buying only at intervals to piece out supply. Prices are held in anticipation of an early improvement.

Buffalo. July 9.

(From our Special Correspondent.)

Anthracite coal has advanced in price 10c. per gross ton wholesale. The rates are, on cars, \$4.40 for grate and \$4.50 for egg, stove, and chestnut; and free on board vessels, \$4.70 for grate and \$4.80 for egg, stove, and chestnut, subject to the usual conditions of sale. Trade for local and near-by points is quiet, but shipping orders for the West and Canada come in quite freely.

Bituminous coal is dull and the market in an unsatisfactory condition for the interest of operators and dealers. The supply is largely in excess of requirements. The demand for propellers and tugs is good.

Coke is quiet and steady.

The shipments of coal from Buffalo from the opening of navigation to July 1st, 1891, were distributed about as follows:

Buffalo to: Net tons.	Buffalo to: Net tons.
Chicago..... 295,190	Owen Sound..... 1,000
Milwaukee..... 220,340	Ludington..... 1,117
Toledo..... 30,587	Washburn..... 1,090
Duluth..... 73,815	Pt. Arthur..... 1,580
Green Bay..... 18,670	Menominee..... 4,720
Detroit..... 5,080	Ft. William..... 8,660
Gladstone..... 9,000	Cheboygan..... 1,050
Superior..... 65,140	Pt. Burwell..... 30
Racine..... 21,290	Bay Mills..... 600
Ashtabula..... 1,250	Windsor..... 680
Saginaw..... 11,105	Marquette..... 1,510
Sheboygan..... 11,680	Ashtabula..... 2,100
Kenosha..... 7,340	Marquette..... 7,500
Bay City..... 2,230	Manitowoc..... 1,350
Manistique..... 60	Separet River..... 400
Mackinaw..... 150	Huron, Ohio..... 300
St. Ste. Marie..... 630	Vessels from Tona-
Alpena..... 150	wanda not reported
Depere..... 1,210	at Custom-House..... 22,383

The quantity of coal shipped hence by lake from July 1st to 8th, both ways inclusive, was 90,680 net tons, distributed about as follows: 63,325 to Chicago, 22,720 to Milwaukee, 2,760 to Duluth, 9,800 to Superior, 2,900 to Marquette, 600 to Alpena, 870 to Kenosha, 800 to Gladstone, 1,000 to Sheboygan, 2,400 to Saginaw, 350 to Marine City, 1,400 to Green Bay, 600 to St. Clair, 600 to Portage, 630 to Lake Linden, and 145 to three other ports. Shipment of coal by canal eastward for first week in July, 710 net tons; receipts, none.

Lake freights on coal are unchanged and with steady feeling. The arrivals from the mines are not sufficient to assure rapidity in the loading of the vessels chartered. The rates hence are 60c. to Chicago, Milwaukee, Green Bay, Kenosha, and Sheboygan; 40c. to Duluth, Superior, Marquette, Saginaw, and Alpena; 50c. to Gladstone, Portage, and Lake Linden; 35c. to Marine City, St. Clair, and Kelly Island.

The old Union Iron Works, in the eastern part of this city, are in process of reconstruction, and by this time next year one of the finest and best equipped blast furnaces ever built will be in operation. In two years hence the steel works to be built in connection will be completed. There will be 6 miles of railroad track on the 53 acres of land to be covered with the plant, connecting with all the roads centering here, and the water frontage will be on Buffalo River.

From interviews had with several dealers of coal

in this city the conclusion arrived at is that the consumption of natural gas takes the place of about 100,000 tons of coal annually. People will not use coal, as a rule, when they can get gas; as, used economically, it is much the cheaper fuel and so much cleaner and without any trouble.

Chicago. July 8.
(From our Special Correspondent.)

The anthracite market is in about the condition last reported. Tonnage is light. Lake freights on iron ore have been advanced, and in all probability those for coal will follow. Trade is certainly not as active as it was at the corresponding time in 1890, while stocks are about the same in extent as they were a year ago. A restrictive policy, rigidly followed, would render the market stronger.

Bituminous coal is dull. Mine agents and wholesalers are not at all anxious for extended contracts at present low rates, while so many of the operators antagonize the recent state legislation.

Ohio and Pennsylvania soft coals are in good demand, and prices are steady. With few exceptions, most of the operators in Indiana and Illinois are marketing their product here.

There is a large surplus of coke in this market, and on all but Connellsville Straight Basin, prices are more or less irregular. Relief will only be afforded by a restriction of production.

Prices of anthracite per ton of 2,000 pounds f. o. b. Chicago are: Lehigh lump, \$6.75; large egg, \$5; small egg, range and chestnut, \$5.40. Retail prices per ton are: Large egg, \$6.25; small egg, range and chestnut, \$6.50.

Prices of bituminous per ton of 2,000 pounds f. o. b. Chicago are: Pittsburg, \$3.25; Hocking Valley, \$3.10; Youngbougheny, \$3.40; Indiana block, \$2.35@-\$2.50; Illinois block, \$2.15@-\$2.25.

Coke.—Connellsville, 72-hour, per ton f. o. b. Chicago, \$5.05; crushed, \$4.75; Walston, \$5; New River, \$5.

Pittsburg. July 9.

(From our Special Correspondent.)

Coal.—The market is firm and active, and the outlook for the fall trade is all that could be desired. There have been no shipments by water since our last report. There have been heavy rains up the Monongahela, and the Signal Service says there will be twelve feet of water. Should this prove correct the coal loaded, about 6,000,000 bushels, will be forwarded to the lower markets. The wickets at Davis Island dam have been lowered, so that there will be no detention when the rise comes.

Connellsville Coke.—Trade continues steady with a fair demand, which will be increased as fast as the furnaces that have been idle go into operation. Last week's shipments reached 5,891 cars, a falling off compared with preceding week of 1,168. The consignment was as follows: To Pittsburg and river points, 1,764; points west of Pittsburg, 3,094; points east of Connellsville, 1,033. Compared with the previous week Pittsburg shipments fell off nearly 500 cars, and those west over 600. Eastern shipments held their own.

Report of the operation and output of the region shows a decrease in production from 126,565 to 111,870 tons, with practically the same number of ovens in blast. The Frick works ran four days, South West six, joint ovens four, McClure five, Rainey six, Cochran six, Hecla four, Hostetter five, furnace ovens six. Of the smaller operating works Archer, Fairchance, Franklin, Great Bluff, Mt. Braddock, Pennsville, Percy, Uniondale, and Chester ran six days, Coro five, Dexter, Home, Emma, and Oventon four.

Prices are as follows: Furnace, \$1.90; Foundry, \$2.30; Crushed, \$2.65 f. o. h. cars at works.

METAL MARKET.

Prices of Silver Per Ounce Troy.
NEW YORK, Friday Evening, July 10, 1891.

July	Sterling Exch'ge	Lond'n Pence.	N. Y. Cts.	July	Sterling Exch'ge	Lond'n Pence.	N. Y. Cts.
4	.....	46½	.....	8	4 86½	46	101½
6	4.87	46¼	101½	9	4.86½	46½	100½
7	4.86½	46¼	100½	10	4.86¼	45½	100¾

Liquidation by speculators has occasioned large offerings and silver has been depressed. It is in demand in London for the continent, but not as prices to attract the metal from this side.

The United States Assay Office at New York reports the total receipts of silver for the week to be 91,000 ounces.

Government Silver Bullion Purchase.

The Treasury Department informs us that the amount of silver purchased during the week was as follows:

July 6	Offered, ozs.	Purchased, ozs.	Average price.
.....	1,437,000	635,000	1.0146
8	1,622,000	645,000	1.0121

WASHINGTON, D. C., July 10 (by telegraph).—The Treasury Department purchased 449,000 ozs. of silver to-day at prices ranging from \$1.075 to \$1.00875 per oz.

Silver Bullion Certificates.

	Price.		Sales.
	H.	L.	
July 4	.....	.....	.....
July 6	101¾	100¾	378,000
July 7	101¾	100¾	739,040
July 8	101¾	101	350,000
July 9	101¾	101	75,000
July 10	100¾	100¾	262,000
Total sales	.....		1,804,000

*Independence Day.

Domestic and Foreign Coin.

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

	Bid.	Asked.
Trade dollars	.....	.....
Mexican dollars	.....	.....
Peruvian soles and Chilean pesos	.....	.....
English silver	4.86	4.90
Five francs	.....	.....
Victoria sovereigns	4.90	4.93
Twenty francs	3.87	3.90
Twenty marks	4.74	4.78
Spanish doubloons	15.55	15.70
Spanish 25 pesetas	4.78	4.83
Mexican doubloons	15.55	15.70
Mexican 20 pesos	19.50	19.90
Ten guilders	3.96	4.00
Bar silver	1.00¾	1.01¾

The Director of the Mint has estimated the value of the standard coins of the nations of the world, to be used in fixing the value of all foreign merchandise exported to the United States on or after July 1, expressed in any of such metallic currencies. The following gives the values of the coins which are changed from the circular of April 1: Boliviano of Bolivia, \$0.736; peso of Central American States, \$0.736; Shanghai tael of China, \$1.087; Haikwan tael of China, \$1.21; peso of Colombia, \$0.736; sucre of Ecuador, \$0.736; rupee of India, \$0.35; silver yen of Japan, \$0.793; sol of Peru, \$0.736; mabhub of Tripoli, \$0.664.

Gold Exports.

The gold exports for the week inclusive of the 10th inst. were \$500,000. There are no engagements for shipment on the 11th inst. The total exports for the year have been \$76,896,721.

Foreign Bank Statements.

The governors of the Bank of England at their weekly meeting on Thursday made no change in its minimum rate of discount, which remains at 2½%. In the week the bank lost £1,193,800 bullion, and the proportion of reserve to liabilities was lowered from 43.21% to 40.24%, against a decline from 34.96% to 34.81% in the corresponding week last year, when its discount rate was unchanged at 4%. The weekly statement of the Bank of France showed an increase of 12,625,000 francs in gold and a decrease of 6,275,000 francs in silver.

Copper.—There has not been much change during the week, but business has been a little more lively, and fair quantities of copper of all descriptions have changed hands. Lake copper is still firmly held by first hands at 13c., but ingot copper in store New York is easily obtainable at 12.90@12.9c. Casting copper has hardened somewhat further, and we have to quote for good brands, according to quantity and description, 12½@12¼c. Cables received from Europe again report that the statistics have decreased, the figures for the last half of June being 900 tons less, and a large business is reported as having been done for India, but lately consumers have abstained from taking further quantities, and this has reacted on the speculative brands, which show a decline of about 1¢, G. M. B.'s being quoted at \$54 15s. @ \$54 17s. 6d. for spot, and \$55 5s. @ \$55 7s. 6d. for three months. Furnace material remains scarce in England, but as smelters are well stocked there is not much demand. The quotations for refined are: English Tough, \$56 10s. @ \$57; Best Selected, \$58 @ \$58 10s.; India Sheets, \$65 @ \$65 10s.; Strong Sheets, \$61 10s. @ \$62; Yellow Metal Sheets, 5½d.

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

To	Commodity	Units	Value
To Antwerp	Copper	Lbs.	\$5,000
S. S. Friesland	30 casks.	37,500	15,000
"	350 pigs.	112,152	49,700
To Havre	306 casks.	382,300	35,000
S. S. La Touraine	Copper Matte.	Lbs.	536,500
To Liverpool	4,976 bags.	536,500	55,000
S. S. City of Chicago	Copper.	Lbs.	50,106
To Liverpool	1,698 pigs.	439,968	18,940
S. Humboldt	364 bars.	50,106	22,416
To Rotterdam	100 casks.	125,000	18,940
S. S. Werkendam	64 bars.	22,416	

Tin.—Tin has been in better demand, and prices have hardened. It is growing more evident that tin is becoming scarce, and on the Metal Exchange there have been hardly any sellers of near delivery tin. We have to quote spot and July 20.50c.; August, 20.60c.; September, 20.50c. The official transactions on the Metal Exchange have been rather light, but a fair consumptive business has been done.

The English market remains dull and not much business has been done. Prices have varied only slightly and the closing quotations are £92 5s. for spot and £92 10s. for three months.

Lead.—Lead has been quieter and we do not hear of much business. There are scarcely any offers from Western smelters and it appears that lead in the country is very scarce, but some spot

parcels being pressed for sale here prices came down to 4.40c., but close firmer again at 4.45c.

The English market has declined and we quote Spanish lead at £12 7s. 6d. and English lead at £12 12s. 6d.

St. Louis Lead Market.—The John Wall Commission Company telegraphs us as follows: "An unfavorable sea-board advice has caused buyers of lead in the West to operate very cautiously, and slight concessions are being made by sellers to effect sales. There have been light sales at 4.30c., but at the close it is generally understood that a majority of sellers would not be very apt to refuse 4.25c. for either July or August delivery."

Spelter.—Spelter continues to be irregular, but in the absence of stocks full prices have to be paid for prompt delivery. From the West we have no fresh news of interest and we quote 5.10c. to 5.12@5.12½c. delivered New York.

In London the quotations are for specials £24, and for ordinaries £23 15s.

Antimony.—Antimony is without alteration and we quote Cookson's 14½c., L. X. 12½c. and Hallett's 12c.

Quicksilver.—The London price is £7 15s. The New York quotation is \$43. The market is very quiet, but seems to be holding its own against a decline of 5s. on the other side.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, July 10.

The iron market continues to present the same featureless aspects. While there is undoubtedly a hopeful feeling concerning the autumn trade, the fact that the crops will be good now being regarded as practically assured, there is still a pronounced dullness in the market. General reports indicate, indeed, that affairs are rather less active just at the present time than during June, when there was quite a revival of business in one or two centers. The closing down of many of the rolling mills for summer repairs is now evidently affecting the market, the general condition of which is reflected by the report that the period of idleness will be longer this year than usual. There are undoubtedly many mills which will remain closed until business shows a decided improvement.

American Pig Iron.—The market has been dull during the past week, and the amount of business done has been small, otherwise there have been no new features of consequence. There is still a scarcity of certain standard brands of No. 1 Northern iron in this market and the prices for these grades continue stiff. Some warrant irons—Lehigh brands—are being offered, however, at a little less than regular prices. We quote: Northern No. 14, \$17@18; No. 2x, \$16@17; Southern, No. 1x, \$17@18; No. 2x, \$16@17.

Spiegeleisen and Ferro-manganese.—There is no change in this market, transactions continuing to be unimportant. We quote: Spiegeleisen, 20%, \$27.50@28.50; ferro-manganese, 80%, \$64@65.

Steel Rails.—There have been some small sales effected during the past week, including one of 1,600 tons to an Eastern road. The price remains firm at \$30 at the mills, and \$30.75 at millwater.

Rail Fastenings.—Business has been dull, and we hear of no orders of consequence that have been placed during the week. The fire at the works of the Diamond State Iron Company, Wilmington, Del., about 10 days ago, burned over 4 acres of ground, destroying the spike and bar mill. This virtually takes one of the largest producers out of the market for the present. We continue to quote: Spikes, \$2@2.10; angle plates, 1.70@1.80c; bolts and square nuts, 2.75@2.85c; hexagonal nuts, 2.95c; complete joint, iron and steel, according to weight.

Tubes and Pipe.—Business shows no new features. We quote discounts on carload lots as follows: 47½% on hutt, black; 40% on galvanized; 60% on lap, black; 47½% on lap, galvanized; boiler tubes, 50% on all sizes; casing, all sizes, 50%.

Structural Material.—The market is gradually showing improvement. Building operations are not very active, but many of the mills are busy upon other lines of work. A number of the angle and plate mills have shut down for repairs. We quote: Universal plates, \$2.25; bridge plates, \$2.10; beams, \$3.10.

Merchant Steel.—Business remains in practically the same condition as last week. We quote as follows: Best English tool, 15c.; net; American tool steel, 7@8c.; special grades, 13@20c.; crucible machinery steel, 5c.; crucible spring, 3½c.; open-hearth machinery, 2.50c.; open-hearth spring, 2.60c.; tire steel, 2.50c.; toe calks, 2.50c.; first-quality sheet, 10c.; second-quality sheet, 8c.

Old Rails.—There does not seem to be any demand or inquiry for old rails, and they are practically out of the market. Quotations, which are merely nominal, may be put at \$21@22.

Wrought Iron Scrap.—This material is in the same condition as old rails. We quote nominally \$21@22 at yards.

Chicago. July 9.

Last week being broken by the National holiday, business in the iron, steel and allied trades was generally more or less quiet. The present week opened with a more active inquiry for crude iron, both large and small lots, Jobbing foundries are

taking more iron, and demand from the general manufacturing trade is broadening. Notwithstanding the continued strike of the architectural iron workers, progress on the large iron and steel structures is but little impeded. Most of the rolling mills here are running, though Bay View Works at Milwaukee will not start up until next week. The accumulation of orders for steel rails has been such that the three plants of the Illinois Steel Company are now in operation—South Chicago, Joliet, and the Union Mills at Chicago, the latter being started up last Monday. Manufactured iron is in fair demand. Iron rails and other old material are still dull.

Pig Iron.—The market is gradually working into better shape, and most dealers and furnace agents are of opinion that the remainder of the year will be more active and profitable than the first six months were. Some of the large charcoal furnaces are not offering any iron on account of the low prices still quoted by several of the smaller ones. A sale of 1,000 tons at price equal to \$17.75 cash Chicago is noteworthy, as many sales of smaller lots are made under those figures. There is no further weakening in Southern iron, though orders are urgently solicited for iron for immediate delivery. Quite a good business is being done in carload lots up to 100 or 200 tons in Southern coke iron. In local coke iron the market is strong and demand quite fair. General manufacturers and foundries are taking more iron, and there is still a good inquiry from the implement trade. The market is quite active for quick delivery of small lots of Blackband softeners and American Scotch iron.

Quotations per gross ton f. o. b. Chicago are: Lake Superior charcoal, \$17@18; Lake Superior coke, No. 1, \$15.75@16; No. 2, \$15.25@15.75; No. 3, \$14.25@14.50; Lake Superior Bessemer, \$17.50; Lake Superior Scotch, \$17@17.50; American Scotch, \$18@18.50; Southern coke, Foundry No. 1, \$16; No. 2, \$15.25; No. 3, \$14.50; Southern coke, soft, No. 1, \$15.50; No. 2, \$14.50; Ohio silveries, No. 1, \$18; No. 2, \$17; Ohio strong softeners, No. 1, \$18.50; No. 2, \$17; Tennessee charcoal, No. 1, \$17.50; No. 2, \$17; Southern Standard Car Wheel, \$21@22.50.

Structural Iron and Steel.—Inquiry is good in a general way, and plans and specifications are nearly completed for several more large buildings. The architectural iron workers' strike is still unsettled, but construction is making good progress. Quotations for car lots f. o. b. Chicago are as follows: Angles, \$2@2.10; tees, \$2.75@2.85; universal plates, \$2.35@2.45; sheared plates, \$2.30@2.40; beams and channels, \$3.20.

Plates.—There are inquiries for 1,000 tons of tank steel, and orders for small lots from store and mill are numerous enough to make the market fairly active. Some mills have advanced prices on tank steel \$3 to \$4 a ton. Quotations remain unchanged: Steel sheets, 10 to 14, \$2.70@2.80; iron sheets, 10 to 14, \$2.60@2.70; tank iron or steel, \$2.50@2.70; shell iron or steel, \$3@3.25; firebox steel, \$4.25@5.50; flange steel, \$3.25@3.40; boiler rivets, \$4.25; boiler tubes, 2 1/2 in. and smaller 55%, 3 to 6 in. 65%, 7 in. and upward 55%.

Merchant Steel.—There is still a fair amount of business coming forward, but it is not as heavy as the previous week's. A more active demand is expected during the month. Tool steel is in moderate demand from the mining districts. Prices remain unchanged: Tool steel, \$6.75@7; tire steel, \$2.30@2.50; toe calk, \$2.50@2.65; Bessemer machinery, \$2.20@2.30; Bessemer bars, \$2@2.10; open-hearth machinery, \$2.00@2.75; open-hearth spring, \$2.75@3; crucible spring, \$3.75@4.

Steel Rails.—Local mills are full of work for the next two months, and a prompt delivery order would be difficult to place here. All the mills are now running on rails. An Eastern mill secured an order for about 3,000 tons for immediate shipment, and another mill one for 300 tons at \$32.75. Prices for prompt delivery orders are advancing. We quote \$31.50@32.50, and \$31 is now a very close figure for round lots for late delivery. Splice bars and other track supplies are in good demand. Splice bars at \$1.95@2 for steel and \$1.85@1.95 for iron, and spikes at \$2.05@2.10 per 100 pounds; track bolts, hexagonal nuts, \$2.85@2.90.

Galvanized Sheet Iron.—Demand is very quiet, more so than is usual for the opening of a new month, and discounts remain unchanged at 67 1/2% off on Juniata and 67 1/2% and 5% on charcoal.

Black Sheet Iron.—Heavier sheets are in better demand than the lighter gauges, though several orders for 1,000 bundle lots were placed for the latter during the week at 2'90@2'95 for No. 27 Common, Chicago. Dealers note an increasing inquiry from the country, and quote 3'20c.

Bar Iron.—Local mills are decidedly firmer in their tone, and decline to shade 1'70c., at which rate all have been taken. Demand is improving from railroads, and the prospects are that the market will be active during the next 60 days. Jobbers report a moderate demand from city and country at 1'80@1'90c. rates.

Nails.—Wire nails are in better inquiry from mill and prices are stiffening, and \$1.95 is called bottom f. o. b. mill. Steel-cut are quiet and both kinds are in light jobbing demand at \$1.75, and \$2.15 for the former.

Scrap.—Railroads are making considerable offerings to consumers. Dealers report business seasonably quiet, and in the absence of large calls prices are nominal. We quote per net ton f. o. b. Chicago: No. 1 railroad, \$18.50; No. 1 forge, \$18; No. 1 mill, \$14; fish-plates, \$21; axles, \$23; horse-shoes, \$18; pipes and flues, \$13; cast borings, \$8; wrought turnings, \$10.50; axle turnings, \$12.50; machinery castings, \$11.50; stove plates, \$8; mixed steel, \$11; coil steel, \$15.50; leaf steel, \$15.50; tires, \$17.

Old Rails and Wheels.—Holders of iron rails look for prices to appreciate in the very near future. We quote \$23 and steel rails at \$14@16, the latter for selected lengths. Car wheels are again quiet at \$15.50@16, at which figures small lots have changed hands.

Louisville. July 4.

(Special Report by Hall Bros. & Co.)

There is nothing new to be said about the market for the past week, sales having been of about the usual quantities with varying deliveries. The jobbing foundries and repair shops are fairly well supplied with orders, but among the mills and larger foundries there are complaints of no business, and some of them are closed down with no dates yet fixed for resuming operations, which will depend largely upon new business that may come in. Under this state of affairs they are not disposed to anticipate their future wants, hence there are no large sales.

Hot Blast Foundry Irons.—Southern coke, No. 1, \$14.25@14.50; No. 2, \$13.75@14; No. 3, \$13.25@13.50. Southern charcoal, No. 1, \$16.50@17; No. 2, \$16@16.50. Missouri charcoal, No. 1, \$17@17.50; No. 2, \$16.50@17.

Forge Irons.—Neutral coke, \$12.50@13; cold short, \$12.50@13; mottled, \$12@12.25.

Car Wheel and Malleable Irons.—Southern, standard brands, \$19.50@20; Southern, other brands, \$17.50@18. Lake Superior, \$20.50@21.50.

Philadelphia. July 9.

(From our Special Correspondent.)

Pig Iron.—Not a single interesting feature has been developed during the last few days. Repairing is going on at the mills, and at some preparations are being made for early resumption. Buyers are quite indifferent as to the alleged inducements held out to them by makers, believing that no sound reason exists for making heavy purchases early in July.

The real fine brands of both forge and foundry are not very plentiful. Both makers and users are quietly awaiting developments. Quotations continue at \$16.75 to \$18.00 for No. 1, according to quality. It is understood that several large Southern furnace companies intend to push their products into Northern markets early in the autumn, or rather to try to do so. No. 2 is entirely neglected. Forge will probably be in quite active demand before the close of the month, a few 1,000-ton lots having been inquired for already. Bessemer is entirely neglected, although quoted at \$17 to \$19, according to quality.

Ferro-manganese.—Quotations are \$16.4.

Steel Billets.—Neither buyers nor sellers are making any efforts to do business, and there is no change in quotations.

Muck Bars.—Makers are doing nothing whatever to solicit business. Prices, \$27 at mill.

Merchant Iron.—All the mills are closed and repairs are being hurried forward. The stocks of iron in consumers' hands are light. Quotations range from 1'70c. to 1'85c., according to quality.

Nails.—The nail trade is extremely dull and prices are very low.

Wrought Iron Pipe.—The fair demand for wrought iron pipe referred to recently still continues. To-day's meeting will no doubt result in more harmony.

Sheet Iron.—There is an abundance of sheet iron in the stores; mills will continue to accumulate stock. Confidence is felt that the fall demand will be quite heavy.

Plate and Tank Iron.—Quotations continue where they were. Only a moderate amount of business is likely to be done for the next week or two. Plate, 2@2'10c. There is very little inquiry for other kinds.

Structural Material.—There is no change in the situation, and the market is entirely flat.

Steel Rails.—The steel rail makers have no reports whatever to give this week. Quotations, \$30 at mill in large lots.

Old Rails.—The old-rail brokers are expecting a few large lots toward the latter part of the month, but decline to say what the prices will be.

Pittsburg. July 9.

(From our Special Correspondent.)

Raw Iron and Steel.—All things considered, trade for the month of July has been remarkably good so far, and prices of standard brands of iron and steel have been well maintained. Generally speaking, July is one of the quietest months of the year; the present month, so far, has exceeded all previous ones as regards prices and transactions. This certainly looks healthy for the fall trade.

Several large blocks of Bessemer have changed hands for August, September and even later deliveries at the highest prices obtained for some time. This fact indicates plainly that leading dealers have come to the conclusion that delays in supplying their wants may be both costly and dangerous, and that the sooner they make arrangements for their necessary supply the better. Stocks in first hands are not very large, early deliveries being difficult to obtain.

Everything seems to indicate a larger volume of business in all departments during the next six months. A well informed business man had this to say: "The second half of the year is entered upon with a greater degree of confidence than was the case with the first, although there is still an unaccountable lack of interest among certain of those who formerly took the lead. That is to say, those who were always in the market when prices were low enough, appear to be unwilling to make bids for large lots, instead of which they range themselves among smaller buyers, taking only what they need for the time being."

"There may be several reasons for this change, the most important, perhaps, being that prices are not likely to fluctuate as in olden times, and that it is therefore not worth while to make heavy investments unless with a fair chance of benefiting to a greater extent than the market has promised during the past 18 months."

"As a matter of fact, the position is in every respect so different from what it was in former years that past experience goes for very little; hence the trade is endeavoring to adjust itself to the new order of things. When a large proportion of our pig metal had to be brought from abroad there was frequently plenty of room for a \$3 or \$4 rise; but now, with a productive capacity more than twice as large as it was 10 years ago, such opportunities are not likely to occur again."

The situation may be summarized as follows: Bessemer iron: Prices fully maintained; sales liberal for season. Mill iron: Steady and unchanged. Steel slabs and billets: For late deliveries holders want an advance. Ferro-manganese is a shade firmer. Muck bar in good demand; prices show an advance. Bloom, billets and rail ends are held at an advance. Steel wire rods show no change; prices are maintained. Spiegel declined a dollar per ton. Skelp iron: Sheared and narrow grooved show no change; wide grooved advanced 1/2 cent per pound. New steel rails: No special sales have been made, but works in this district are running full, and have orders ahead for some time to come; prices \$30 f. o. b. cars at works. Iron ore: Large buying still continues; prices seem to have reached lowest point.

Scrap Material.

200 Tons Steel Rails, Short Gross.....	\$18.00 cash.
100 Tons Cast Borings, Gross.....	11.00 cash.
100 Tons Cast Scrap, Gross.....	13.75 cash.
100 Tons Soft Steel Scrap, Gross.....	17.00 cash.
100 Tons Old Car Wheels, Gross.....	17.50 cash.
200 Tons Crop Ends, Gross.....	16.25 cash.
50 Tons Iron axles, Hammered, Net.....	28.50 cash.

Coke Smelted Lake and Native Ores.

4,000 Tons Bessemer, Aug., Sept., Oct., del. Wheeling.....	16.70 cash.
4,000 Tons Grey Forge.....	14.10 cash.
3,000 Tons Grey Forge.....	14.00 cash.
2,000 Tons Bessemer.....	16.60 cash.
2,000 Tons Bessemer, July.....	16.65 cash.
2,000 Tons Grey Forge.....	14.10 cash.
1,500 Tons Bessemer.....	16.25 cash.
1,500 Tons Grey Forge.....	14.15 cash.
1,500 Tons Bessemer.....	16.50 cash.
1,500 Tons Bessemer, July, Aug.....	16.75 cash.
1,000 Tons Grey Forge.....	14.10 cash.
1,000 Tons Bessemer.....	16.40 cash.
1,000 Tons Grey Forge.....	14.00 cash.
1,000 Tons Bessemer.....	16.65 cash.
500 Tons Grey Forge.....	14.00 cash.
500 Tons Bessemer.....	16.60 cash.
500 Tons Grey Forge.....	14.00 cash.
500 Tons Grey Forge at Valley furnace.....	13.90 cash.
500 Tons Grey Forge at Valley furnace.....	13.90 cash.
500 Tons Bessemer.....	16.50 cash.
300 Tons White Iron.....	13.50 cash.
100 Tons No. 2 Foundry.....	15.00 cash.
100 Tons Silvery.....	16.00 cash.

Steel Slabs and Billets.

5,000 Tons Rod Billets, Aug., Sept., Oct.....	26.00 cash.
2,000 Tons Rod Billets at Wheeling.....	26.00 cash.
1,000 Tons Slabs and Billets.....	26.40 cash.
500 Tons Nail Slabs.....	26.25 cash.
500 Tons Billets.....	26.00 cash.

Muck Bars.

1,500 Tons Neutral, July, Aug, Sept.....	27.25 cash.
1,000 Tons Neutral, July, Aug.....	27.00 cash.
1,000 Tons Neutral.....	27.00 cash.
500 Tons Neutral, August.....	27.00 cash.

Ferro-Manganese.

250 Tons 80%, Seaboard.....	63.75 cash.
200 Tons 80%, Pittsburg.....	66.50 cash.
130 Tons 80%, Seaboard.....	64.00 cash.

Skelp Iron.

1,400 Tons Narrow Grooved.....	1.62 1/4 4 m.
1,250 Tons Sheared Iron.....	1.85 4 m.
1,000 Tons Wide Grooved.....	1.65 1/4 4 m.

Steel Wire Rods.

1,500 Tons Three Rods.....	36.50 cash.
750 Tons Three Rods.....	36.25 cash.

Bloom, Beam and Rail Ends.

1,000 Tons Bloom and Billet Ends.....	18.00 cash.
500 Tons Bloom and Rail Ends.....	17.75 cash.

Charcoal.

100 Tons No. 1 Cold Blast.....	28.00 cash.
100 Tons Cold Blast.....	26.50 cash.
100 Tons No. 2 Foundry.....	21.50 cash.
50 Tons No. 1 Foundry.....	22.00 cash.

Old Iron and Steel Rails.

500 Tons Long Steel Rails.....	18.50 cash.
500 Tons American T's.....	23.00 cash.
500 Tons Steel Rails.....	18.25 cash.
250 Tons Iron Rails.....	23.25 cash.

STOCK MARKET QUOTATIONS.

Table with columns: COMPANY, Bid, Asked, Baltimore, Md. Includes entries like Atlantic Coal, Balt. & N. C., Big Vein Coal, etc.

Birmingham, Ala.

Table with columns: COMPANY, Bid, Asked, Birmingham, Ala. Includes entries like Ala. Coal & I. Co., Ala. Conn. C. & C. Co., etc.

Pittsburg, Pa.

Table with columns: COMPANY, Bid, Asked, Pittsburg, Pa. Includes entries like Allegheny Gas Co., Bridgewater Gas Co., etc.

St. Louis.

Table with columns: COMPANY, Bid, Asked, St. Louis. Includes entries like Adams, Colo., American & Nettie, etc.

Trust Receipts.

Table with columns: Sales, H, L, Trust Receipts. Includes entries like American Cotton Oil, National Lead, etc.

Trust Stocks.

Table with columns: COMPANY, Bid, Asked, Trust Stocks. Includes entries like Am. Cotton Oil, Am. Sugar Refineries, etc.

Foreign Quotations.

Table with columns: COMPANY, Highest, Lowest, Foreign Quotations. Includes entries like Almada, Mex., Amador, Cal., American Belle, Colo., etc.

Paris.

Table with columns: Paris, June 25. Includes entries like Belmez, Spain, Callao, Venez., etc.

CURRENT PRICES.

Those quotations are for wholesale lots in New York.

CHEMICALS AND MINERALS.

Table with columns: Chemicals and Minerals. Includes entries like Acid-Acetic, Commercial, in bbls. and cys., Carbonic, liquefied, etc.

Table with columns: Minerals. Includes entries like Asbestos-Am., Italian, on c. i. f. L'pool., Ashes-Pot, 1st sorts, Pearl, Asphaltum-P, ton., etc.

Table with columns: Minerals. Includes entries like Caustic, Iodide, Nitrate, refined, Bichromate, etc.

THE RARER METALS.

Table with columns: Rarer Metals. Includes entries like Aluminum-Pure, Arsenic, Barium, Bismuth, Cadmium, etc.

BUILDING MATERIAL.

Table with columns: Building Material. Includes entries like Bricks-Fronts, nominal, Croton, Wilmington, etc.

DIVIDEND-PAYING MINES.

NON-DIVIDEND PAYING MINES.

Main table with columns: NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS, DIVIDENDS, NAME AND LOCATION OF COMPANY, CAPITAL STOCK, SHARES, ASSESSMENTS. Includes entries for Adams, Alice, Alma & Nel Wood, Amador, American Belle, etc.

G., Gold. S., Silver. L., Lead. C., Copper. * Non-assessable. + This company, as the Western, up to December 10th, 1881, paid \$1,400,000. † Non-assessable for three years. ‡ The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends, and the Con. Virginia 40,000,000. ** Previous to the consolidation of the Copper Queen with the Atlanta, August, 1885, the Copper Queen had paid \$1,350,000 in dividends. †† This company paid \$130,000 before reorganization in 1890. ††† This company acquired the property of the Raymond & Ely Company which had paid \$3,675,000 in dividends.

NEW YORK MINING STOCKS QUOTATIONS. DIVIDEND-PAYING MINES. NON-DIVIDEND-PAYING MINES.

Main table of New York Mining Stocks Quotations, divided into Dividend-paying and Non-dividend-paying mines. Columns include Name and Location of Company, dates from July 4 to July 10, and Sales.

*Ex dividend. †Dealt at in the New York Stock Ex. Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold, 7,360. Non-dividend shares sold, 21,800. Total New York, 29,160. †Independence Day.

BOSTON MINING STOCK QUOTATIONS.

Table of Boston Mining Stock Quotations, listing company names and prices for dates from July 3 to July 9, 1891.

‡Ex-dividend. †Independence Day. Boston: Dividend shares sold, 4,325. Non-dividend shares sold, 4,594. Total Boston, 8,919.

COAL STOCKS.

Table of Coal Stocks, listing company names and prices for dates from July 4 to July 10, 1891.

* Shares sold in New York, 2,710; in Philadelphia, 6,311. Total sales, 37,641. † Par value, \$50.

Deadwood.

Table of Deadwood mining stocks, listing company names and prices for July 6, 1891.

San Francisco Mining Stock

Table of San Francisco Mining Stock Quotations, listing company names and prices for dates from July 3 to July 9, 1891.