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We shall be greatly obliged to any of our readers who will give information concerning the location and value of a certain New York & Silverdale Mining, Milling and Improvement Company.

Independent free coinage by the United States means silver monometallism, not bimetalism, and nothing could so retard the adoption of international, the only real bimetalism, as would the adoption of the silver basis by this country. Let us keep to the gold basis, and help to increase the demand for gold until other countries recognize the necessity for bimetalism. We produce both metals, more gold it is true than silver, but a large part of the world's output of each, and are more independent than any other country. It would be pure folly to give up our advantages for the benefit of the other gold basis countries as we would do if we went onto the silver basis.

The policy of secrecy and mystery in the mining business, which has brought so many scandals and has done so much injury to the mining industry, has already induced a fall of about 50 per cent. in the "Bigelow Stocks" in Boston. The eminently respectable Calumet & Hecla Mining Company is largely responsible, by its example, for the adoption of this policy by other companies. It is greatly to be regretted that directors of mining companies appear to forget that they are simply trustees for their stockholders and owe to them a full and frequent accounting of the manner in which they administer their trust.

Cost of Producing Copper Abroad.

The market price of copper makes the question of its cost of production a most important one. At its present figure when trade and enterprise are normally healthy the consumption is greater than it has ever been before, and, so far as new work is concerned, there is every prospect of a slight and steady increase in the consumption. At the same time it must always be borne in mind that copper is not a metal that can be entirely worn out, corroded and cast away, so that with a greater use of copper in industrial enterprises the greater will be the supply from what might be termed the reserves of old copper. This was very forcibly exemplified at the time of the copper corner that occurred in 1888 and 1889, and which finally collapsed in the month of January of the latter year, Lake copper being quoted at that time 17½ cents per pound. One cause of the collapse was the unexpected appearance in the market of old copper from every quarter of the globe, India and the East generally, contributing quite considerably. What had been looked upon as worth very little, and at best only a nominal sum for reworking locally, at once assumed a real value, though no doubt exaggerated, for export, and this second-hand copper in no little way contributed to break down the corner. So far as the present price is concerned, it seems to us a very healthy one, since the mines that are best equipped and best managed can make satisfactory, and in some cases, ample profits at the present rate of cost and marketing.

The reports that we have recently published and commented upon editorially, of the principal copper mines in this country and abroad prove that about 11 cents a pound is sufficient to pay expenses and fair dividends, but at the same time the margin of profit at that figure is dangerously narrow for other considerable producers under different conditions.

The production of Chile is small in comparison to the total week's supply with what it used to be, being in 1895 only 23,428 metric tons. The cost of production is extremely difficult to arrive at, but there must be some money in the business, judging from private advices we are in receipt of, and in the slight increase in the annual production. The largest producers are private firms or close corporations publishing no accounts, and the only guide that we can have to the cost of production in Chile is the annual account published by the Copiapo Company.

Taking this mining company's property as representative, we find the amount of ore produced during the year is very small in comparison with the large copper mines of other countries, being in the 12 months ending June 30th, 1895, 10,813 metric tons of 18.27 per cent. ore, showing an increased production and value over 1894. The reserves as recently estimated, however, are quite considerable, amounting to 28,614 tons, of 17 per cent. ore, and 44,000 tons of 3 per cent. ore. But in spite of all these advantages of working high grade copper ores, and a very fair tonnage, the best profit that could be shown without making any allowance for decrease in value of property was but little over \$10 per long ton on the total copper production, or less than half a cent a pound of copper produced.

When we put the United States, Spain, Portugal and Chile, on one side, the next important producer is Japan, with an output of 18,727 metric tons, the cost of the production of which is very difficult to ascer-

tain, but we hope within a few weeks to be in possession of some figures that will give us the approximate cost of the largest of the Japanese producing properties.

Germany ranks next as a producer, with 16,820 metric tons, and here we have a very good clue indeed to the cost of production in the full and detailed reports issued by the Mansfeld Company, which, it may be fairly said, stands for the whole of Germany, as its usual production amounts to 95 per cent. of the total.

Australasia, which at one time was so important a factor in the copper market, now only figures for 10,160 metric tons out of the enormous total for the world of nearly 340,000 tons. We learn the cost of producing copper under the conditions existing in Australasia, although they may not be absolutely identical, but at the same time considering that the Wallaroo and Moonta Company produces more than half of the total, it is fair to assume that the cost will not vary much from the figures we give below. The astonishing feature of the report addressed to the stockholders at Adelaide, S. A., is that it has been possible for the company to pay any dividends at all. For instance, the accounts show that in 1895 there were 28,579 tons raised, nearly one-half of which contained 20 per cent. copper, and the balance of which had a grade of 14 per cent. copper. In the preceding year the tonnage was less and therefore presumably the mining cost was less, being 2,133 tons less than in 1895, but at the same time the grade of copper contained in the ore was higher, more than one-half being 21 per cent. copper. When we come to the cost, and judging from our knowledge and experience of what is being done elsewhere on low-grade ores, it seems almost incredible that such high-grade ores, worked upon this large scale, should not be more profitable than they are, and it would require an expert's report to explain why the mining cost per ton of copper should be as shown in the company's own reports, more than \$153, the smelting cost per ton of copper \$52.50, and the shipping and other charges (exclusive of the charges deducted in the account sales) more than \$5 in addition per ton of copper, or in round figures \$212.88. This being equivalent to £42 12s. per ton of copper delivered, would seem to indicate in place of any dividend paying capacity there would be an absolute loss, as the average price in England for 1891 was £51 9s.; for 1892, £45 12s.; for 1893, £43 15s.; for 1894, £40 7s., and for 1895, £43

Mexico is becoming a large producer. In 1895 its output was 11,958 metric tons, of which the Boleo produced 10,769 tons.

The Merced Gold Mine Bubble.

The Merced bubble is on the point of bursting—as was predicted by the *Engineering and Mining Journal* in September, 1895. The Merced Gold Mining Company has a capital of \$1,500,000 in 100,000 shares. Of this, \$10 a share, or \$1,000,000 has been paid up, and the stock is still subject to a call of \$5 a share or \$500,000.

The amount actually paid for the property was, we believe, about \$125,000, though it is stated on excellent authority that it was offered, and could, at the time, have been purchased at or below \$100,000. The official statement filed July 1st, 1895, by the company (which is a Montana corporation) says that \$333,330 was paid for property.

The Boston *Herald*, September 28th, 1895, stated (and the statement was never contradicted) that the Merced Company "paid for the property \$150,000 cash, 33,333 shares, stamped \$10 paid, \$16,670 cash to Messrs. Coram, Palmer and Couch, for money expended and services, and possibly \$20,000 to one John Boyd for a water ditch. Here is a total outgo of \$186,670 cash and \$333,330 in shares," the *Herald* also said that "dividends at the rate of \$10 a share per year are looked for" when 200 stamps are running. When the *Engineering and Mining Journal* exposed the scheme the shares, with \$10 paid, were quoted \$60 to \$65 or at the rate of from \$6,000,000 to \$6,500,000 for the property. No official statement had or has yet been published or furnished the stockholders as to the quantity of ore "in sight," the average grade of this ore or the cost of mining and milling, and the directors refused to give any such information. At the same time brokers and others in Boston who are familiarly known as "The Bigelow Boomers" were giving out "tips" that the ore ran from \$12 a ton upward, and that the stock would surely go to \$100 a share.

The *Engineering and Mining Journal* stated what the property cost, that the former owners had never been able to make the mines pay continuously and that the average grade of the ore was about \$4 a ton or "from \$0 to \$5."

Now, at last, we have some official information published by the Boston News Bureau of the 13th instant as follows:

"The Merced Gold Miningshareholders are notified this morning of a telegram received from the mine yesterday: 'Mill returns show during the month of April 2,303 tons of ore treated, the yield being \$8,700 gold and 25 tons sulphurets, assay value \$75 per ton of 2,000 pounds. This shows a yield of \$4.59 per ton of rock treated. The first return was in the month of March, 1,285 tons treated, showing gold obtained \$1,630 and 9 tons sulphurets, averaging \$62.43 per ton of 2,000 pounds.'"

Counting that 90 per cent. of the gold in sulphurets can be saved by the comparatively expensive treatment of chlorination this can be tabulated as follows:

	Tons milled.	Yield.		Total yield per ton.
		In bullion.	From Sulphurets.	
March.....	1,285	\$1,630	\$505	\$1.67
April.....	2,303	8,700	1,687	4.51
Total.....	3,588	\$10,330	\$2,192	\$3.49

The result of a two months mill run gives us the average yield of the ore as \$3.49 a ton, assuming that the very large proportion of 90 per cent. can be extracted from the sulphurets.

The value of the ore in the March run was only \$1.67 per ton, the knowledge of which fact was confined to the officials for more than a month, during which there were large transactions in the stock.

This low yield (\$1.67 a ton) is said to have been due to new copper plates which, it is well known, absorb some gold; but it is, perhaps, more important to account for the comparatively high yield of \$4.51 per ton in April. Is it possible that the revelation of March induced the managers to mill only their good ore in April to learn the best that could be obtained?

With an average yield of \$3.49 per ton, it is very evident that the mine is not paying expenses and even with a strictly economical management and 200 stamps (and there is no evidence that the mine could keep them supplied with ore) the dividends of the company would have to be looked for with a magnifying glass. It will be admitted that when the *Engineering and Mining Journal* said the ore would run about \$4 a ton, it was well informed, and when it asserted that the policy of secrecy in managing a mining enterprise as a "blind pool" would lead to scandals and injury to the industry it was also correct. It would be rash to accept the stock as a present on condition of paying up the \$5 a share still due on it, and which it is reported will shortly be called in.

It will also be remembered that the *Engineering and Mining Journal* announced that Captain Palmer and Captain Couch, who, with Mr. Coram, were the promoters of the company and directors in it, sold out their stock while it was about \$47 a share. Captain Palmer has since retired to England with his share of the "boodle" from this and other Bigelow schemes.

The directors of the Merced Gold Mining Company are, or were last year, as follows: A. S. Bigelow, president; Thomas Nelson, secretary and treasurer; T. E. Hopkins, C. H. Palmer, Thomas Couch, G. H. Lyman and J. G. Ray.

We again invite these gentlemen, or any of them, to make public the original expert reports on the property and to give any information as to the disposition of the \$666,667 cash which was paid into the company.

The Mineral Production of California in 1895.

The California State Mining Bureau has just issued in tabular form a statement showing the mineral production of the State for the year 1895, thus bringing before the public with commendable promptness, the results obtained during that year in the mining industry. The statement is not only given in detail for the State, but is particularized by counties. According to its figures the value of the total mineral product of California in 1895 was \$22,844,664 against a total of \$20,203,294 in 1894, showing the substantial increase of \$2,641,370, a considerable part of which was due to the greater production of gold.

The mineral production is divided into four classes, which we take up below in detail. The first, and by far the most important of these is formed by the metallic products, quantities and values of which are shown in the following table:

Substance.	METALLIC.		Value.
	Unit measure.	Quantity.	
Gold.....	.....	.....	\$15,384,318
Silver.....	.....	.....	599,790
Chrome.....	short tons	1,740	16,795
Mineral paint.....	"	750	8,425
Quicksilver.....	flasks	36,104	1,337,131
Manganese.....	short tons	880	8,200
Copper (fine).....	pounds	225,000	21,900
Lead.....	"	1,582,400	49,364
Antimony, ore.....	short tons	33	1,485
Platinum.....	ounces	150	900
Totals.....	.....	.....	\$17,378,308

The most notable increase is that shown in the production of gold: amounted to \$1,763,920 over the production of 1894, and to \$3,254,317 over that of 1893, a gain made notwithstanding the fact that the resumption of hydraulic mining, which was promised under the present law, has only been very partial and on a limited scale. The greater gold output has come almost all, if not altogether, from the quartz mines of the nearly every county which is a producer at all showing an improvement. Of the 52 counties in California 33 produce gold in some quantity and over 20 in large amounts. As we have noted in previous articles, the greater part of this gain comes not from new discoveries, but from the State. It has been divided among all sections of the gold-bearing regions, extension of existing mines, the reopening of old mines which were abandoned.

done years ago and the adoption of improved processes and methods of working at many mills.

Gold is by far the most important single interest in the State, and the mining of silver holds an exceedingly subordinate place. No silver mines of any size are found outside the Calico district in San Bernardino County, which produced a little over one-third of the silver reported, the remainder being silver parted or obtained from the gold bullion obtained in the assay office or the San Francisco Mint. In the above table silver is credited at its nominal or coinage value, showing an output of 463,910 fine ounces. If this is reduced to its commercial value, taking the average price of silver during 1895, the amount is \$302,934, which would reduce the total given in the table above by \$296,856.

Next in importance to the precious metals is the output of quicksilver. The mines of that metal are still very actively worked and show a substantial gain in production over 1894. Napa, Santa Clara and Trinity counties are the leaders in this production, and nearly all the mines of the State were in active operation last year, although no new discoveries were made.

The other mineral products include chrome ore, which was one of the few industries showing a diminished output; antimony, of which a small amount was obtained from the mines in Kern County; lead from Inyo and Mono counties; copper from Amador, Calaveras and Nevada counties, chiefly obtained in connection with the gold mines; manganese ore and platinum. Of the latter metal 150 ounces are reported which is not assigned to any particular locality, but was obtained in the assay office from refining gold.

The non-metallic substances, which are of considerable importance, are shown in the following table:

NON-METALLIC.			
Substance.	Customary measure.	Quantity.	Value.
Borax.....	Short tons.	5,950	\$595,900
Coal.....	"	79,859	191,790
Salt.....	"	53,031	180,576
Asbestos.....	"	25	1,000
Gypsum.....	"	5,158	51,014
Magnesite.....	"	2,200	17,000
Soda.....	"	1,900	47,500
Total.....			\$1,058,780

This production calls for but little comment. California is not rich in mineral fuels and the only coal supply obtained within the State, with the exception of a few thousand tons from Southern California, is from the Mount Diablo and Lone mines, which last year furnished about 70,000 tons. The main supply has to be brought from abroad; a part comes from Oregon and Washington, but the chief supply is from the mines of British Columbia, although Australia and Great Britain furnish a considerable quantity, the coal being transported at very low rates by vessels coming to California for wheat cargoes. The foreign coal competes successfully with the domestic in the California markets, notwithstanding the duty which is imposed upon the former.

In accordance with our usual custom we have omitted from this table mineral waters, which the Bureau values at \$291,500. Our reasons for not including these have been so often stated that they hardly need repetition here.

The third division of the Bureau's report includes the hydro-carbons and gases. The production of petroleum in California has increased very considerably, the discoveries of new oil territory in and around Los Angeles some two years ago having been utilized by the boring of numerous wells, so that the district is now actively worked. Asphalt and bituminous rock are mined in increasing quantities, as the value of the California product is recognized.

HYDRO CARBONS AND GASES.			
Substance.	Customary measure.	Quantity.	Value.
Asphaltum.....	Tons.	25,525	\$170,500
Bituminous rock.....	"	38,921	121,586
Natural gas.....	"	.....	112,000
Petroleum.....	Bbbls.	1,245,339	1,000,235
Total.....			\$1,404,321

The fourth and final division of the report is structural materials, in which are included the product of the quarries of various kinds of stone, the cement, the bricks and other materials made from clay and the lime. These are given in the table below:

STRUCTURAL MATERIAL.			
Substance.	Customary Measure.	Quantity.	Value.
Granite.....	Cu. ft.	288,419	\$24,329
Lime.....	Bbbls.	37,784	386,094
Stone.....	Tons	71,355	71,691
Macadam (broken stone).....	"	840,650	706,987
Marble.....	Cu. ft.	14,864	56,566
Onyx.....	"	1,200	12,000
Paving blocks.....	M.	2,332	73,338
Rubble.....	Tons	414,038	394,952
Sandstone.....	Cu. ft.	55,242	35,373
Serpentine.....	Sup. ft.	4,000	4,000
Soapstone.....	Tons	25	375
Slate.....	Squares	1,350	9,450
Cement, Hydraulic.....	Bbbls.	16,283	32,556
Bricks.....	M.	131,772	672,350
Pottery, sewer pipe, etc.....	Tons	37,669	39,685
Total.....			\$2,713,755

The growth of several well established industries is shown by the total value given in this table. California is well supplied with building stones of varying qualities, especially of the finer kind, such as granite and marble, while onyx has been found in some localities, and is quarried on an increasing scale. The State is also well furnished with lime and materials for the manufacture of cement, and supplies nearly all the home demands.

After all the notable feature is in the increase in the gold production, which shows that the fears entertained by many some years ago—but in which we never shared—that the gold resources of California were becoming exhausted, is without foundation. The gain made in the last two years by the simple and legitimate extension of mining and improvements in milling is, we believe, only a commencement; a still greater improvement is promised in the future, especially if the people of California continue to do as they are doing at present and regard gold mining as a steady and legitimate industry, to be pursued with the same care and on the same business principles as any department of manufacture or commerce, and steadily discourage the bringing forward of the "wild cats," of which a few survive. Legitimate mining has made a large part of the present wealth and prosperity of California, and has done it in spite of the injury inflicted on the industry by operators of a different class.

NEW PUBLICATIONS.

ENGINEERING TRANSLATIONS IN ENGLISH AND SPANISH. By J. A. Standing. London and New York, 1895. Hirschfeld Brothers. Pages 69. Price \$1.

This latest addition to the Hirschfeld series is the kind of book of which the time-worn expression, "fills a long-felt want," holds true. Spanish is notoriously deficient in idiomatic technical expressions, particularly in regard to the parts of steam engines and machinery of all kinds. Mr. Standing has placed side by side the English and Spanish names of some 1,600 technical parts of boilers, engines, cranes, machinery of all kinds, tools, iron and steel industries, pumps, valves, etc. Our chief regret is that he has not attempted a technical, up-to-date dictionary to include mining and metallurgical terms.

The Spanish used by Mr. Standing smacks of the "Diccionario de la Academia" and is not always the colloquial language used in Mexico or South America and even in certain provinces of the mother country. Thus he translates bicycle by "velocipede de dos ruedas" or literally two-wheeled velocipede, whereas the Spanish American countries have imitated the gay Parisians and speak of the "bike" as a "bicicleta," a Gallicism which may not meet with the approval of the Spanish Academy of the Language but which nevertheless is most generally used.

Occasionally Mr. Standing makes remarkable translations, as for instance, when he says that the English equivalent of "calamina" is "ore, brass ore." As a matter of fact, it is calamine, a zinc ore. In a number of places the author has made similar errors, but the engineer or mechanic who has occasion to use technical Spanish will find Mr. Standing's little book of value to him. It is well printed, and it is of convenient "pocket" size.

A GUIDE TO SYSTEMATIC READINGS IN THE ENCYCLOPEDIA BRITANNICA. By James Baldwin, Ph. D. Chicago and New York, 1895; The Werner Company. Pages 316.

The title of this book indicates its purpose. The author very properly believes that an encyclopædia such as the *Britannica* is more than a mere work of reference to be consulted occasionally. There is a widespread belief that an encyclopædia is a sort of dictionary of subjects, if we may be permitted the expression, and this is precisely what Dr. Baldwin wishes to correct. The author has written a number of books about books, and his previous experience in compiling and selecting the choicest specimens of the works of standard writers, has been of undoubted value to him in the preparation of the *Guide*.

Dr. Baldwin divides his book into three parts, devoting them to the "Young People," the "Student" and the "Busy World," respectively. Part I outlines a series of "Home Readings" in history, biography, science, and games, sports and pastimes. The maturer student will find no less than 14 chapters suggesting what studies to pursue for a complete course of instruction, embracing almost every topic of interest in mental and natural philosophy, literature, history, religion, folk lore, etc.

The professional or business man is not neglected, Dr. Baldwin devoting a chapter each to merchants, bankers, mechanics, farmers, journalists, lawyers, miners, and last but not least, the "home maker."

In all instances copious references are made to the subject under discussion, the author giving not only the name of the topic but also the volume, page and column, thus minimizing the labor of the searcher. The book is obviously written in the interest of the *Encyclopædia Britannica* and it is of little use to anyone who does not own a set of the edition referred to by the author. But to the possessor of the *Britannica* Dr. Baldwin's *Guide* is more than useful; it is almost indispensable.

BOOKS RECEIVED.

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

Annual Coal Statistics for 1895. Philadelphia, Pa.; Alder & Raley. Pages, 175. Price, 50c.
Steel: A Manual for Steel-Users. By William Metcalf. New York; John Wiley & Sons. Pages, 170; illustrated by diagrams.
Fourth Biennial Report of the Bureau of Labor Statistics of the State of Colorado, 1893-1894. Denver, Colo.; State Printers, Pages, 471; illustrated.

Annario de la Minería, Metalurgia y Electricidad de España; 1896. By Roman Oriol, Madrid, Spain; E. Teodoro. Pages, 375. Price in New York, \$3.50.

Report on the Coal Mines in the Territory of Utah, for the Fiscal Year Ended June 30, 1895. By James B. Rawlings, United States Coal Mine Inspector for Utah. Washington, D. C.; Government Printing Office. Pamphlet; pages 6.

Pennsylvania Geological Survey: A summary description of the geology of the State. Volume III., parts 1 and 2. By J. P. Lesley, State Geologist, Harrisburg, Pa.; State printers. Pages 610 and 510 respectively; with maps and illustrations.

A Treatise on Surveying: Comprising the Theory and the Practice. Part I.: Land Surveying and Direct Leveling. By William M. Gillespie. New York; D. Appleton & Company. Pages 127; illustrated by diagrams and maps. Price, \$2.50.

University Geological Survey of Kansas. Volume I. A Report on the Stratigraphy of the Carboniferous of the State and Allied Subjects. By Erasmus Haworth, State Geologist, Topeka, Kan.: State Printer. Pages 320; with map and illustrations.

Electric Lighting: A Practical Exposition of the Art, for the Use of Engineers, Students, and Others Interested in the Installation or Operation of Electrical Plants—Volume I.: The Generating Plant. By Francis B. Crocker. New York; D. Van Nostrand Co. Pages 450; illustrated by diagrams. Price \$3.00.

Comparative Tests of Nickel Iron Alloys.

Sir: During the last few years there have appeared from time to time in the various technical journals numerous papers on the action of nickel in alloy with steels, and its influence in increasing the strength and toughness of this metal. While these papers are of exceeding interest and value to the trained metallurgist and mechanical engineer, yet their technical nature and the bewildering array of figures presented renders it difficult for the practical steel maker, the superintendent of machine shops, or the foundry foreman to grasp their true value. For this reason I propose to show in this paper, in practical units and figures, which are readily comprehended and remembered, the effect which nickel has on the strength of wrought iron, cast iron and steel.

The first report which has been made on the alloys of nickel with wrought iron is that of Professor Rudeloff, of the Royal Prussian Testing Department, which is quoted in *The Iron Age* of April 23d, 1896. In these experiments a very pure wrought iron was melted with various proportions of nickel and cast into ingots, which were then cut into bars 1 in. square. These bars were fastened in a testing machine, and a gradually increasing load was applied. The weight necessary to start a stretch in the material, the weight required to break it, and the percentage of its length which the bar stretched, were then determined. These figures I have reduced to tons of 2,000 lbs., and they are as follows:

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. Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

Company Mongering in Colorado.

Sir: In an article entitled "Company Mongering in Colorado" (*Engineering and Mining Journal*, issue April 25th). Mr. Weston, E. M., describes some of the evils attending indiscriminate company promotion in England and Colorado.

Mr. Weston prefaces his remarks with a dissertation on the vices associated with company promotion in England, and speaks of London as having reached the highest pitch in this art, excelling any other city in the practices which are intended to "gull" the over-trusting public.

Immediately following is a description of methods adopted in Colorado to lure the "tenderfoot" which have no parallel in London.

Such practices as the selling of stocks on false quotations (known as "rigging") would not be tolerated in England, and any attempt at such fraud would be followed up by prosecution of the perpetrators.

Why need Mr. Weston have gone all the way to England for subject matter in this letter on "Company Mongering in Colorado?" English methods yield the palm to Colorado if we can believe what he writes.

Mr. Weston's writings smack too much of a disgruntled Englishman who finds it profitable to take an Anti-English role in Colorado.

If Mr. Weston would only realize that as long as there are fools to be fooled (some authority writes of a new crop of fools coming with each decade), there will be no lack of mining sharks to take in those that come their way. The intelligent business public. Mr. Weston ought to know, has learned to discriminate between an honest and properly indorsed prospectus and a "fakir's" circular. Capital nowadays will not follow the first "crank" that comes along with something in the mining line. Business men, worthy of the name, do require responsible advice and hire capable engineers to give it. As for the victims of stock manipulation of every description that Mr. Weston expresses pity for, people who buy stocks in something they know little or nothing about get invariably bitten, and if they cannot take a lesson any other way let them learn it by experience. There is no lack of literature to warn them against wild cat schemes if they would only read and profit by it.

The employment of reputable mining engineers to pass upon the merits of a mining property before it is brought out is very expedient, but scientific attainments unless directly associated with the profession of mining, are not, however, necessary. We too often see men in these mining camps who by reason of an F. C. S. or F. R. G. S. appended to their names, presume that they are eminently qualified for mining engineers, and after one or two trips through the underground workings of a mine they will talk boldly of the "hanging," "contact," "porphyry," etc., etc., and within a few days will tell you a great deal about the theory of ore deposition that was never known before! Then again some men make mining the "life study" that Mr. Weston speaks of, but even that in some cases is no recommendation.

Mr. Weston's remarks criticize the alphabetical attachment to the names of English engineers reporting on mining properties for the English market, but what about the use of the letters M. E. indiscriminately?

There is just as much harm done to the mining profession by the use of the letters E. M. and M. E., when they represent no degree or special training, as is done by any other class of misrepresentation.

The schools that have the right to give these degrees require a long course of study and training before conferring this of proficiency, and it is not enough to such schools that students should choose to spend a year or two in any particular branch of the curriculum. It is the random and illegitimate use of these letters, which should represent a degree, where more often they signify nothing, that misleads the public as often as anything else. Scientific training is just as necessary as practical experience in the mining profession, and the man that has both has the advantage over the man who has the one only.

By what particular virtue does Mr. Weston appropriate the degree E. M., Engineer of Mines, when he advertises to hail from the Royal School of Mines, London? Is not the degree conferred by that Academy, that of A. R. S. M. (Associate of Royal School of Mines), and if Mr. Weston's scientific attainments entitle him to that degree, why does he not use it?

When Mr. Weston, in his anxiety to put himself in print, as he explains, "writing to get business," suggests remedies for that particular species of "mote" the promoter, why does he not treat the "beam" in his own optic?

FORBES RICKARD.

CENTRAL CITY, Colo., April 30th.

A bar of wrought iron 1 inch square, Iron plus % Ni.	STRETCHING TESTS.	
	Stretched under load of 10% tons.	Broke under load of 23 tons.
1.00%	11 1/2	22 1/2
2.05%	11 1/2	23 1/2
3.00%	17	26 1/2
3.64%	14 1/2	28
4.93%	23 1/2	28 1/2
7.84%	31 1/2	31 1/2
		39 1/2
		29%
		20%
		26%
		22%
		20%
		17%
		10%
		9%

The resistance to compression was determined by noting the weight which a short pillar 1 inch square would support without shortening on its length.

CRUSHING TESTS.	
One inch square pillar of pure iron supported a weight of	12.9 tons.
Pure iron + 5% nickel	11.2
" " + 1.01%	14.1
" " + 2.66%	18.6
" " + 3.01%	20.3
" " + 3.98%	20
" " + 4.92%	27.4
" " + 7.84%	36.2
" " + 15.6%	81.5

The resistance to shearing was determined by placing a bar under a cutting edge and noting the weight which was necessary to apply the edge in order to shear the bar.

SHEARING TESTS.	
The pressure necessary to shear a wrought iron bar 1 in. square was	18.9 tons.
The pressure necessary to shear iron with 56% nickel was	18.4 tons.
" " " " " " " " " " " "	20.2
" " " " " " " " " " " "	21.7
" " " " " " " " " " " "	23.7
" " " " " " " " " " " "	24.5
" " " " " " " " " " " "	26.0
" " " " " " " " " " " "	30.9
" " " " " " " " " " " "	48.1

The limit to which it is safe to load any material is not the weight which will break that material, but the weight which will cause it to commence to stretch. If the load be less than that which will cause a stretch, this load can be applied an indefinite number of times without causing damage, whereas a weight greater than that required to produce a stretch, but less than that required to break the material can be applied only a few times before the continued stretching causes a dangerous weakness. This stretching point or elastic limit of any metal is the factor of greatest importance in calculating the strength of metals subjected to a pulling strain. From the report of Professor Rudeloff it will be seen that the addition of a small percentage of nickel to wrought iron raises not only its final breaking strength, but also, and in a more marked degree, the more important elastic limit.

The shearing tests above given are also of great interest from the fact that in almost all riveted work the strain on the rivet is not a simple strain, but partakes of a shearing or cutting side motion. As will be seen by the shearing tests above, the resistance of wrought iron to shearing can be increased from 18 to 48 tons by the addition of nickel, a factor which promises to be of the utmost importance in relation to the use of nickel-steel in the manufacture of boilers.

From numerous experiments lately made on the action of nickel in alloy with steel, I select a few average samples. A soft, open-hearth flange steel was made at the Cleveland Rolling Mill, and was tested in comparison with similar steel to which 2.89% nickel had been added.

	Stretched at 17 1/2 tons	Broke at 27 1/2 T	Stretched 27%
1 in. square, soft open-hearth steel			
1 in. square, soft open-hearth steel + 2.89 Nickel	23.5 tons	32.8 T	24%

This shows a gain of 33% in the factor of safety; hence a boiler of this nickel-steel would allow 33% higher steam pressure than if similar steel without nickel were used. No difficulty is experienced in working this nickel boiler steel under the rolls or hammer.

Taking steels a trifle higher in carbon, such as used for structural work, the tests made on a Z bar are of interest. This steel contained about .25% carbon.

One inch square bar of common steel stretched under a load of 18 1/2 tons, broke at 31 tons, and stretched 26%.

Similar steel bar containing 3.30% nickel stretched under a load of 31 1/2 tons, broke at 43 1/2 tons and stretched 22%.

The factor of safety was, therefore, increased 64% by the addition of nickel.

A steel boiler plate for the steamship Chicago, containing about .25% carbon, was compared with a similar steel containing 3.5% nickel.

One inch square bar common steel stretched at 15 1/2 tons broke at 30 1/2 tons, stretched 27%.

One inch square bar steel + 3.5% nickel stretched at 30 1/2 tons, broke at 43 1/2 tons, stretched 21%.

It will be noticed that a load which broke the common steel did not cause the nickel-steel to commence to stretch. These tests are a fair av-

erage of the nickel-steels used by the United States Navy Department, and the tests show very plainly that the addition of 3 or 3½% of nickel increases the factor of safety of steel from 50 to 60%.

In harder steels, containing about 5% carbon, a comparison may be made of a nickel-steel containing 4.98% nickel, and a common steel of almost identical composition except the nickel.

One inch square bar common hard steel stretched at 23½ tons, broke at 41½ tons, stretched 19%.

One inch square bar steel with 5% carbon and 4.93% nickel (stretch not given) broke at 63½ tons, stretched 16%.

The point at which stretch commenced was unfortunately not determined, but the breaking strength was raised 53%. The most important point gained by the use of nickel in steel is that low carbon steels alloyed with 3% or 3.5% nickel retain all the softness and toughness of soft steels, while gaining all the superior qualities of high carbon steels. They are, moreover, free from the brittleness and treacherous nature of high carbon steel, and are not so liable to break or crack under unskillful handling. This freedom from cracking is a very prominent feature of nickel-steels, and is admirably shown in the tests of armor plate. Under the impact of heavy shot, common steel is very liable to crack and break into small pieces. A shot striking a nickel steel plate with the same energy may penetrate, but in so doing does not crack or fracture the plate, which behaves in this respect like copper, yielding to a punching strain without brittleness. Ordinary steel, if strong, is hard and brittle; nickel-steel is strong and fibrous.

The effect of nickel on cast iron is to increase its transverse strength, though not to such a marked degree as in wrought iron or steel. Addition of 3% nickel to good foundry iron increases its transverse strength about 12%, the tests being made by applying a gradually increasing weight to a bar supported at both ends. Nickel diminishes the tendency of foundry iron to chill in the moulds. A bar 1 in. square cast in sand mould with one steel face was in the case of foundry iron chilled completely through, while a bar of similar foundry iron alloyed with 1% nickel was chilled only one-third.

In general terms the effect of nickel in increasing the strength of wrought iron, cast iron and steel seems to be in inverse proportion to the amount of carbon present. The added strength is proportionately greater in tool steel than in cast iron, greater in soft steel than in hard and is especially noticeable in pure wrought iron. The greater the amount of carbon present the less effect does the addition of nickel seem to have. Its greatest use would seem to be in alloy with the softer steels and wrought iron. In all cases where it is desirable to increase the strength of any structure or machine, or where the strength is to remain the same, but lightness of structure or machinery is desired, the important part played by nickel-steel and nickel-iron alloys is self-evident.

DAVID H. BROWNE,

Chemist for the Canadian Copper Company.

CLEVELAND, O., May 9th, 1896.

THE KENT COAL-FIELD, ENGLAND.

From time to time during the last six or eight years announcements have been made of the discovery of extensive coal-fields in Kent, on the south coast of England, but in the absence of any exact statement of facts such announcements have usually been judged to be bull points put forward by the South Eastern Railway Company, under whose auspices the borings were undertaken. During the past few months, however, the matter has assumed quite a different complexion, for a syndicate has been formed to work the coal beds, and the operation of sinking shafts has already been commenced. The syndicate has been formed privately, and it is prosecuting its work in strict secrecy. No information is being given to the public, and as far as we know no other newspaper is aware of what is going on.

The discovery of coal near Dover dates back to the days when the South Eastern Railway was beginning the Channel tunnel. After Parliament had thrown out the bill for this scheme, Sir Edward Watkin, the chairman of the railway, asked his geologists what they would recommend him to turn his attention to next, and Prof. Boyd Dawkins, acting on his knowledge gained in designing the tunnel, promptly suggested that he should bore for coal. This was accordingly done, and after several years of experimental boring the existence of an extensive series of coal beds has been practically proved. At Shakespeare Cliff, near Dover, the coal measures were struck at 1,110 ft.; at 1,135 ft. a seam of coal 2 ft. 6 in. was found; at 1,229 ft., 1,279 ft., 1,456 ft., 1,570 ft., 1,763 ft. and 1,831 ft. there are seams all averaging 2 ft. to 2 ft. 6 in. thick; while at 2,177 ft. there is a 4-ft. seam. These seams have been proved to extend for several miles, but exact figures are not obtainable, and probably the facts are known to no one but Mr. Brady, the engineer of the Southeastern Railway, who is conducting the borings. The syndicate has acquired as yet only about 600 acres of land which was originally bought by the railway company for the purpose of conducting boring trials.

Work has already been commenced on two shafts 20 ft. wide, and machinery capable of getting 2,500 tons per day of 10 hours has been contracted for. It is estimated that with this plant the coal should cost about 6s. per ton at pit's mouth, a figure which is slightly in excess of the average in the United Kingdom.

The capital of the syndicate is £200,000, divided into 100,000 preference shares of £1 each, and 100,000 ordinary shares of £1 each. The promoters take all the ordinary shares and 30,000 preference shares as fully paid up, and the remaining 70,000 preference shares have been privately subscribed.

Exports of Manufactures.—The proportion which exports of manufactures play in the total of American export trade went on increasing in March, as it has in nearly every month for the past two years. The proportion of manufacturing exports to total exports was large in March, 1895, reaching \$15,576,786 in exports of \$83,623,752, or 24.48%. The figures for March, 1896, are \$19,125,785 for manufactures, out of total exports of \$74,004,652, or 25.85%. These figures raised the total manufacturing exports for the nine months ending March 31st to \$132,405,784 in 1895, out of total exports of \$612,964,271, or 21.60%; but the manufacturing exports for the corresponding nine months of the fiscal year 1896 have been \$163,187,926, out of total exports of \$664,286,000, or 24.57%.

THE VOLATILIZATION OF SILVER IN CHLORIDIZING-ROASTING.

By L. D. Godshall.

The latest revised edition of Mr. C. A. Stetefeldt's book on the Lixivation of Silver Ores, which appeared very recently, contains no mention of the volatilization of silver in chloridizing-roasting—an omission which is the more remarkable in view of the fact that in former editions of the work this important subject was noticed. Moreover, Mr. Stetefeldt has discussed it to some extent in his paper on "The Stetefeldt Furnace,"* in which he criticised certain statements made by me before the Colorado Scientific Society in May, 1893, in a paper entitled "A Review of the Russell Process,"† and Mr. Morse, in his paper on "The Lixivation of Silver Ores by the Russell Process at Aspen, Colorado,"‡ has given statistics showing the loss of silver by volatilization (including the dust loss, which Mr. Morse estimates at not more than 1%) on more than 30,000 tons of ore roasted, to have been 9.16%. The matter must certainly be deemed important enough to warrant me in returning to it, and offering, with the aid of the figures made public since my first paper, a reply to the criticisms of the late Mr. Stetefeldt.

The passages of my paper which he deemed to be "questionable conclusions from a limited experience with the Stetefeldt furnace at the Holden Mill, Aspen, Colo.," were quoted by him,§ and are here repeated for the convenience of the reader:

"The use of this furnace has certain limits beyond which it is unwise to go. Siliceous ores carrying 6% or more sulphur can be chloridized better in some other furnace. Ores carrying a large percentage of lime—say from 15 to 20% of CaO—are also very difficult to chloridize properly in the Stetefeldt furnace, unless sufficient sulphur is present to combine with the CaO and form CaSO₄; even then the chloridization in the furnace is frequently very low and rarely exceeds 60%.

"The writer has seen the furnace deliver roasted ore from certain mixtures high in lime and sulphur where not more than 15 to 20% of the silver had been chloridized in the shaft of the furnace, where about 65% of the ore is roasted. However, after the above ore had been lying on the cooling floor for three days fully 30% of the silver was found to be chloridized. The extremely low percentage of the silver converted into chloride in the furnace was due partly to its having been crowded beyond its capacity, but chiefly to the large percentage of sulphur present causing such a strong reducing atmosphere of sulphur dioxide that the effect of the chlorine liberated by the acid gases was neutralized. Frequently the odor of sulphurous acid escaping from the roasted ore as it was discharged from the shaft of the furnace was sufficiently strong to overcome all smell of chloride fumes. The sulphur in the raw charge of the ore just considered ranged from 8 to 10%, being about half that of the lime and magnesia present."

"Can such ores be roasted better with any other furnace? Metallurgically, the answer is, Yes. The proof of the above assertion with regard to Aspen ores has been demonstrated by the writer by roasting in a reverberatory furnace 10 lots of ore containing 25% of CaO (MgO not determined, but probably amounting to 10 or 12%) with less than 2% of sulphur and using practically the same amount of salt as in the Stetefeldt furnace. The chloridization was all that could be desired."

"For ores containing from 3 to 8% of sulphur the Brückner, Pearce or Howell-White are to be recommended."

To these statements Mr. Stetefeldt makes two general objections: first, that they were based on too limited an experience; second, that they were not accompanied with adequate data in the way of proof. As to the first, I venture to submit that while my experience was confessedly limited to the ores of a certain district, it comprised nearly a year of continuous observation, practice and experiment, and was, therefore quite long enough to warrant the formation of an opinion concerning the materials to which it referred, and, by analogy, other similar materials. As to the second objection I have only to say that at the time I wrote the Aspen Works were still in operation and the company was unwilling to have exact details made public. This deficiency has been completely made up through the later publication of complete statistics by Mr. Morse in his paper above cited.

Mr. Stetefeldt points out what seems to him an inconsistency between my statement that "siliceous ores carrying 6% or more sulphur can be chloridized better in some other furnace" than the Stetefeldt, and any subsequent statement that "for ores containing 3 to 8% of sulphur, the Brückner, Pearce, or Howell-White are to be recommended." But he will perceive, on reflection, that the two propositions are not inconsistent. The hypothesis, for instance, that ores carrying from 3 to 6% of sulphur could be chloridized as thoroughly by the Stetefeldt as by either of the three rival furnaces named, but that, for such ores, one of the three was to be recommended on other grounds, such as smaller cost of construction, or smaller loss in roasting, would remove the fancied contradiction.

Leaving these preliminary and subordinate criticisms, let us consider the first important point urged in opposition to my conclusions, namely, that the Aspen ore is exceptional and peculiar, and must be acknowledged to be "a difficult ore to chloridize in the Stetefeldt as well as in any other furnace." This difficulty in a Stetefeldt furnace is admitted by all who have made the attempt to overcome it; but the proposition cannot be admitted as regards "any other furnace."

On page 103 of Mr. Stetefeldt's book is given a description of the manner in which an ore should be tested to determine its fitness for lixiviation. It is there observed that roasting-tests are best carried out in the muffle of an assayer's cupelling-furnace, in clay dishes about 4½ to 5 in. in diameter, holding a charge of 3½ A. T. On the following page we read:

"It is not always possible to produce by muffle-roasting, on a small scale, the same effect that can be obtained by actual mill work; especially if an ore is treated requiring banking up on the cooling-floor for many hours, in order to reach a high chlorination of the silver. Hence, an unfavorable result is not always a proof that the ore is unsuitable for lixiviation."

The natural conclusion is, that if an ore is easily chloridized in small

* *Trans.*, xxiv., 3, Am. Inst. M. E.

† *Proc. Col. Sci. Soc.*

‡ Florida Meeting, March, 1895, *Trans.*, xxv., 137.

§ *Trans.*, xxiv., 10.

* *Trans.*, Am. Inst. M. E.

quantity, in an assay furnace, it would be as well, or better, chloridized on a commercial scale in a large furnace. As to the correctness of this proposition I will say nothing here; but, accepting it for the present as true, I give the results of its application to the Aspen ores.

The experiments, the results of which are recorded below, were made as follows: The raw ore was crushed so as to pass through an 80-mesh sieve, 150 grammes taken and thoroughly mixed with 16% salt and 4% of iron pyrites containing about 40% of sulphur, roasted from 15 to 30 minutes, commencing with a very low and ending with a light-red heat. After cooling, the roasted mixture was carefully removed from the dish and weighed, and again assayed to determine the loss by volatilization, the percentage of soluble salts also being determined. Leaching tests were now made to determine the percentage of silver-chloride formed in the roasting, and the proper method of applying the Russell solution to obtain the highest possible extraction of the silver.

TABLE I.—LABORATORY EXPERIMENTS IN CHLORIDIZING ASPEN ORES.

Name of Ore.	Analysis.							Silver chloridized.	Best extraction by Russell Process.
	Ounces Ag per ton.	SiO ₂ .	Fe.	CaO.	MgO.	BaSO ₄ .	Zn.		
Justice.....	13.2	14.9	20.8	6.5	.....	33.1	3.5	96.2	98.9
Sylvanite.....	36.0	53.8	11.1	5.4	.....	12.4	.....	92.0	96.5
Camp Bird.....	20.9	43.6	7.3	12.0	.....	22.4	0.8	98.6	99.0
Pride of Aspen.....	11.5	27.4	3.1	27.6	8.0	0.5	1.4	95.6	98.5
Compromise.....	12.5	44.2	4.3	17.1	.....	.....	0.8	95.9	97.0
Percy.....	25.5	18.1	8.2	18.9	.....	21.8	2.0	98.0	99.6
Franklin.....	41.8	28.6	4.3	21.8	.....	9.0	2.1	96.7	98.6
Smuggler.....	64.2	2.8	2.2	6.5	.....	78.0	2.4	90.9	97.9
Aspen.....	19.9	15.5	2.6	25.5	.....	.....	.....	96.5	98.2
Mixtures of different samples of Aspen ores.									
No. 1-2 samples.....	46.0	33.1	4.0	4.6	0.7	46.4	2.0	98.3	95.7
" 2-2	32.7	6.8	2.2	16.6	.....	41.5	3.3	95.1	96.3
" 3-3	38.0	25.2	3.4	12.5	2.8	33.2	2.2	98.5	98.5
" 4-9	25.7	18.3	8.5	20.2	.....	18.7	2.0	97.9	99.2
" 5-19	25.5	21.8	8.5	19.2	3.4	13.4	3.1	97.7	98.5
" 2.....	32.2	Roasted with 4 per cent. pyrite.				.....	.....	91.4	97.3
" 4.....	23.2	" " " 12 " " salt.				.....	.....	97.0	.....
" 4.....	23.2	" " " 4 " " pyrite.				.....	.....	91.9	96.6
" 4.....	23.2	" " " 10 " " salt.				.....	.....	94.9	.....
" 4.....	23.2	" " " 8 " " salt.				.....	.....	.....	.....

* Attention is called to these results, which were obtained without the addition of any pyrite in the chloridizing-roasting.

A great many experiments with results similar to the above might be recorded here. In fact, the results were all so uniformly good that they soon became monotonous, and the experiments were discontinued.

In view of the above results, I claim that Mr. Stetefeldt is not warranted in making the statement that the Aspen ores are difficult to chloridize in any furnace. Mr. Stetefeldt says that the fact that the sulphur in the Aspen ore (as mixed for roasting) exceeds the limit given by me from 2 to 7%, would force one to the conclusion that the Stetefeldt furnace at the Holden mill was a complete failure, and that Mr. Morse's statistics contradict this. Instead of contradicting, Mr. Morse has since confirmed this fact very conclusively.

Mr. Stetefeldt says: "It is well known that high chlorinations of silver-ores containing a large percentage of pyritic minerals can only be obtained after roasting in a Stetefeldt furnace by leaving the discharged ore for 24 hours, or longer, in heaps on the cooling floor. But why should this be made an objection?"

In my review of the Russell process, reasons were given for considering heap-roasting on the cooling-floor extremely objectionable. Mr. Morse, in his paper on "The Effect of Washing with Water upon the Silver Chloride in Roasted Ore," while differing with me as to the reactions involved, is equally emphatic in condemning this heap-roasting for ores containing as much zinc (from 1 to 3%) as those treated at Aspen. And Mr. Stetefeldt himself, on page 65 of the last edition of his book, accepting Mr. Morse's theory as to the cause of the trouble, indirectly condemns heap-roasting and the Stetefeldt furnace for all ores containing from 1 to 3% of zinc, and a sufficient amount of pyritic minerals to make such supplementary heap-roasting necessary.

He controverts my statement that the supply of free oxygen is extremely limited in the heap on the cooling-floor. The reactions given by him as occurring in this heap-roasting are undoubtedly correct, but he does not show that these are the only ones which occur; and in any event, the fact that three or four days are required to oxidize by means of these reactions the comparatively small amount of sulphur still in the ore, seems to me conclusive evidence that the admission of air to the interior is very slow and limited. This impression is confirmed by the fact that the crust of the heap chloridizes in as many hours as days are required to chloridize the interior to an equal degree.

My theory as to the loss of silver by volatilization in chloridizing-roasting is declared to present nothing new. But the question of originality is not so important as the question of fact.

In the first edition of his book, Mr. Stetefeldt said:

"It is a well established fact that the loss of silver by volatilization in roasting in a Stetefeldt furnace is a minimum and almost imperceptible, this loss being principally a function of time."

It was this statement which I controverted in the paper which he criticizes. What he now says is:

"The evaporation or volatilization of all substances is governed by the same general laws. The effective elements are: time, temperature, surface exposed, character of the atmosphere in which evaporation or volatilization takes place, density or pressure of the latter, and its motion or exchange in relation to the substance evaporated or volatilized. Thus, for instance, more silver is volatilized in roasting a small ore sample in a muf-

fle than in actual reverberatory-furnace work, because more surface is exposed, and the particles have more contact with air in the former case (The italics are mine.)

TABLE II.—RESULTS OF ASPEN ORE ROASTED IN MUFFLE FURNACE.

Name of Ore.	Amount taken.	Salt. Per cent.	Sulphur. Per cent.	Time of Roasting.	Silver Volatilized. Per cent.
Smuggler.....	.....	16	2	.....	35.7
.....	.....	16	2	.....	70.6
Percy.....	From 50	16	2	From 15	53.5
.....	.....	16	2	.....	46.5
Compromise.....	to 150	16	2	to 30	45.5
Mixture No. 1-2 Samples.	.....	16	2	.....	51.9
" 2-2	grammes.	16	2	minutes.	46.1
" 3-3 .....	.....	16	2	.....	33.4
" 2-9 .....	.....	16	2	.....	30.6
" 5-19 .....	.....	16	2	.....	29.4

TABLE III.—RESULTS OF ASPEN ORE ROASTED IN STETEFELDT FURNACE.

Ore.	No. of tons.	Salt. Per cent.	Sulphur. Per cent.	Silver volatil. Per cent.	AgCl formed in furnace. Per cent.	Decrease by washing. Per cent.
February run.....	2,090	11.32	9.49	7.4	37.04	32.41
March.....	1,319	11.52	8.18	7.62	43.32	37.16
April.....	2,435	9.75	8.48	4.9	46.94	19.58
July.....	2,123	12.03	7.3	10.8	53.51	8.6
August.....	2,687	11.61	7.1	11.18	59.82	3.32
September.....	2,656	11.27	7.4	11.57	56.78	0.51

TABLE IV.—RESULTS OF ASPEN ORE ROASTED IN REVERBERATORY FURNACE.

Name of Ore.	Amount.	Salt. Per cent.	Sulphur. Per cent.	Time of Roasting.	Silver Volatilized. Per cent.
Aspen.....	.....	16	2	.....	5.7
Camp Bird.....	From 1 to	15	2	From 6	0.8
Durant.....	.....	10	2	.....	4.8
Percy.....	2 tons of	10	2	to 9	5.4
Justice.....	.....	15	2	.....	4.3
Compromise.....	each.	10	2	hours.	0.7
J. C. Johnson.....	.....	15	2	.....	7.9

The above results need no comment, so far as the comparative volatilization of silver is concerned. Mr. Stetefeldt argues that the loss at Aspen might have been in dust escaping from the last dust-chamber to the chimney, and hence not fairly chargeable to volatilization. He cites the experience at the Ontario mill, where in flues about 150 ft. long 4 ft. wide and 6 ft. high, interposed between the dust chambers and the chimney, 1.26% of the silver in the ore is recovered. It would be interesting to know the composition of the material saved in these flues, and especially the percentage of condensed fume containing silver previously volatilized. At Aspen, a considerable amount of such material was saved in the rear end of the dust chamber, as may be seen from the following table:

TABLE V.—CHLORIDIZED ORE SAMPLES, BEGINNING WITH NO. 1 TAKEN FROM SHAFT OF STETEFELDT FURNACE, AND ENDING WITH NO. 21 TAKEN FROM FOOT OF STACK.

No.	Ounces Ag per ton.	Pb. Per cent.	Solubility. Per cent.	No.	Ounces Ag per ton.	Pb. Per cent.	Solubility. Per cent.
1.....	30.0	2.6	16.5	12.....	18.2	6.6	32.5
2.....	26.8	2.0	10.3	13.....	18.2	7.2	33.5
3.....	21.4	0.6	7.7	14.....	19.0	7.9	35.7
4.....	21.3	Tr.	6.6	15.....	19.2	9.9	38.2
5.....	17.0	1.0	11.7	16.....	19.7	13.2	38.5
6.....	17.0	2.3	15.7	17.....	20.3	17.8	40.2
7.....	18.4	3.0	18.8	18.....	24.0	14.0	36.5
8.....	17.2	3.0	20.3	19.....	24.4	10.5	26.4
9.....	18.8	3.9	22.8	20.....	21.6	13.2	40.5
10.....	19.1	4.6	24.0	21.....	22.2	12.9	36.2
11.....	17.5	5.0	26.0	.....	.....	.....	.....

The actual volatilization of silver in the furnace itself at Aspen was even greater than the figures I have previously given, by the amount of volatilized silver thus recovered.

That the conditions above stated are not peculiar to Aspen ores exclusively, was indicated by the treatment of several hundred tons of Creede ores in Aspen furnaces. These ores contained approximately 90% of silica, no lime, and 1%, or less, of sulphur. The detailed results are not in my possession; but I am informed that the chloridization in the furnace was remarkably good, but that the loss by volatilization was even greater than on any of the Aspen ores.

Mr. Stetefeldt concludes his paper with the frank admission that "the fact that the loss of silver by volatilization during chloridizing-roasting in the Stetefeldt furnace is a minimum, under all circumstances, as compared with roasting in any other furnace, lacks absolute proof." In view of the foregoing discussion I think we may fairly ask for evidence that such loss in that furnace is a minimum under any circumstances.

Cost of Railroad Construction in Japan.—The cost of construction per mile of line in Japan, according to the report for the year ending March, 1894, varied considerably, according to the circumstances under which it was carried out. That of the Tokio-Yokohama section of 18 miles was 162,741 yen per mile; but this being the first railway undertaken in the country was necessarily expensive, as it was superintended by foreign engineers and carried out to a considerable extent by foreign labor. The same was true, although to a less degree, of the Koke Otsa section, which was begun in November, 1870, and completed in September, 1879, and of which the cost per mile was 142,659 yen—or dollar. Probably the Yokohama Ozuki section, which was begun August, 1885, and completed April, 1889, may be taken as representing the best average conditions. Its length is 258 miles, and its average cost per mile was 52,156 yen. As indicating the great reduction in the cost of construction, the report shows that before the nineteenth fiscal year the amount of fixed capital per mile of line open in the government railways was 104,697 yen, whereas in the twenty-sixth year it was only 64,671 yen. The decrease arose not only from the cheaper method of construction adopted, but also from the fact that the services of foreigners were almost entirely dispensed with, and native material and manufacturers employed as much as possible. The proportion of working expenses to the revenue is 36%, and when compared with that of the previous year shows a decrease of 11%, obtained from a large increase in the earnings, and decrease in the expenses incurred in operation, especially in the locomotive expenses, and the low price of coal which prevailed during the year.

* Atlanta Meeting, October, 1885, *Trans.*, xxv., 587, Am. Inst. M. E.

ELECTROLYTIC MANUFACTURE OF WHITE LEAD.*

By R. P. Williams.

This new process of making white lead is a radical departure from all the old ones in not employing acetic acid at all, but in acting upon lead with nitric acid, which is generated by electricity.

The process consists of four reactions, as given below. First, the electrical preparation of nitric acid and sodium hydroxide. Second, the action of the nitric acid on lead, forming lead nitrate. Third, the reaction of lead nitrate and sodium hydroxide to form lead hydroxide. Fourth, the combination of lead hydroxide and sodium bicarbonate to form lead carbonate.

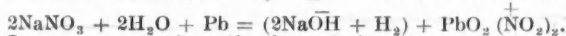
In the first step of the process, a solution of sodium nitrate is decomposed by an electric current from a dynamo. The strength of solution required is not important, 10° Baume, or say 1 lb. to the gallon, being sufficient. This solution is put into a series of cells, constructed of wood, and divided into two compartments by a porous partition. At the plus electrode is fastened a pig of lead, and at the minus a sheet of copper. The solution being run in from an overhead reservoir, and the current turned on, the nitrate is decomposed according to equation 1, nitric acid collecting at the plus electrode and sodium hydroxide at the minus. The nitric acid at once attacks the lead and forms lead nitrate, which dissolves, equation 2, whereas the sodium hydroxide produces no effect on the copper at the negative pole. Finally the lead nitrate solution and the sodium hydroxide solution are drawn off separately, and mixed as desired, in quantitative proportions, in a receptacle. The result, as shown in equation 3, gives lead hydroxide as a white, amorphous precipitate, and leaves sodium nitrate in solution. This is practically the original nitrate, and its regeneration shows one of the economic excellences of the process, for the nitrate can be used over and over again, as the source of more acid.

It has been found, at the experiment station, that but little additional sodium nitrate is required for a repetition of the process as complete as the original. The lead hydroxide is then filtered from the sodium nitrate. This is done automatically and continuously, by a rotary filtering device, and the sodium nitrate is pumped back into the original reservoir. The fourth step is, in some respects, the most interesting of all, and consists in adding to the lead hydroxide a solution of sodium bicarbonate (or of the normal carbonate). Reaction (4) at once takes place. It will be noted that sodium hydroxide is the product in solution, and lead carbonate the precipitate. Another beauty of this process is that the sodium hydroxide removes most of the impurities, if there are any, in the lead hydroxide; for instance, it will dissolve any salts of aluminum or of zinc, and it removes organic matter.

These impurities appear in the solution, leaving the precipitate remarkably white. Once more, this by-product, sodium hydroxide, by passing carbon dioxide into it, is converted into bicarbonate and the latter can be used again. Thus the main agent in each of the two principal steps, sodium nitrate and sodium bicarbonate, is made to do duty over and over again, with but slight additions.

- (1) $\text{NaNO}_3 + \text{H}_2\text{O} = \text{NaOH} + \text{HNO}_3$.
- (2) $2\text{HNO}_3 + \text{Pb} = \text{Pb}(\text{NO}_3)_2 + \text{H}_2$.
- (3) $\text{Pb}(\text{NO}_3)_2 + 2\text{NaOH} = \text{Pb}(\text{OH})_2 + 2\text{NaNO}_3$.
- (4) $\text{Pb}(\text{OH})_2 + \text{HNaCO}_3 = \text{PbCO}_3 + \text{NaOH} + \text{H}_2\text{O}$.

It is doubtful whether (1) and (2) take place as above, but probably the reaction is as follows, since hydrogen is liberated at the minus electrode:



Let us now turn from the theoretical to the practical part of the matter. The first question which naturally arises is, will this process so beautiful in theory, and as a laboratory experiment, work on a large scale and give sufficiently practical results to compete with the other methods of manufacture, and make it a lasting contribution to inventive science?

An experimental station was for several months in operation in Cambridge, Mass., erected and run under the direction of Mr. Arthur Benjamin Brown, the inventor of the process. This was capable of turning out some 500 lbs. of white lead per day. Its success was regarded as beyond question. The cost of white lead by this process is more than covered by the gain in weight, and is but a fraction of the cost by the Dutch method. The reasons are, first, in the electrolytic process pig lead is used as it comes from the smelting furnace. In the Dutch it has to be remelted, cast into "buckles" of definite size, and, after the action of acetic acid, from one-third to one-half is left uncorroded and has to be recast.

Second, the process is almost instantaneous, as every reaction takes place rapidly, while by the other mode from two to six months are required.

Third, in materials and labor there is great saving. No free acid is used, either acetic or nitric, and the agents sodium nitrate and bicarbonate are used repeatedly. By the old method a plant covering a large area is filled for months with fermenting tan bark or manure, acetic acid and lead, while the process is going on, and at its completion, the product is removed with much labor, and has to be thoroughly and repeatedly washed to dissolve out any lead acetate remaining. It must be ground and reground under water, and even then is not likely to be of uniform texture. It is also a poisonous and dirty process. The electric method being continuous, is complete the same day, requires but a very small force of men, as almost all the operations are automatic, and is a clean and non-poisonous process.

The texture of the product is almost molecular in fineness, as might be expected from its being produced by replacement in the hydroxide. Hence it needs no grinding. It is so fine as to remain suspended in water for a long time, and in order to filter it a special brand of cloth had to be made, as even filter paper would scarcely retain it.

One of the most important practical questions is: How does paint made from electrolytic white lead compare with that made from Dutch lead in durability, opacity and covering power? Specimens have been submitted to some of the largest dealers and painters in New England and

elsewhere, and Mr. Brown, the inventor, has spent the last two years, aided by a competent corps of assistants, not only in the development of his new process, but in making thorough and systematic tests of the product. Inside and outside surfaces have been exposed to the severest extremes of weather, to the varied fumes of the laboratory, and to other crucial tests. Dutch paint and electrolytic paint have been exposed side by side for two years, and no difference can be detected in durability or opacity. The covering power of the new paint is considerably greater than that of the Dutch. Experiments vary as to the increased percentage from 12 to 20, or even higher, but in no case was there found to be a smaller percentage.

What is the cause of such an increase? This leads us to discuss somewhat more fully the nature and composition of white lead made by the various processes. Dutch white lead consists, approximately, of two molecules of the carbonate to one of the hydroxide, $2\text{PbCO}_3 \cdot \text{Pb}(\text{OH})_2$. This, however, appears not to be constant, as might be inferred from its mode of manufacture. Lead hydroxide is a white, amorphous substance. Lead carbonate is either a spongy, transparent, globular powder or is crystalline. Whether globular or crystalline depends upon its mode of preparation. Now certain properties of these two forms are quite different, and this difference explains the use of one and the disuse of the other form as a pigment. The globules of the one form are said to be from 0.00001 to 0.00004 of an inch in diameter. These, in the grinding of lead with linseed oil, are supposed to take up the oil, somewhat as a sponge absorbs water. The Dutch process lead is the globular variety, and to this fact has been attributed the greater body and permanence of the paint made from it than that made by most other processes. The crystalline variety of the carbonate is found not to absorb oil to anything like the same extent as the globular, no matter to what degree of fineness it is ground, the surface of the minute crystals being impervious. Half a century ago Thenard invented the "quick process lead," or "French process." This is now carried on in Clichy, France, and some other places, and sold as "Clichy White." It is made by dissolving litharge in acetic acid and then passing into the sub-acetate of lead solution formed, carbonic acid gas. Thus is formed neutral lead carbonate. It was at first thought to be a revolutionary process, but it soon became apparent that the product did not give the capacity or body which Dutch lead gave, and of course it lacked permanence. Made in this way the carbonate is crystalline. Under the brush it is found not to cover as much surface and not to spread as well, or it is said to lack "body," although of the same composition as the other. Other rapid processes—and there have been hosts of them—have invariably met with no better success, for the reason that the carbonate formed is the crystalline instead of the globular variety. To this fact we may mainly attribute the long continued use of Dutch process lead. The committee of experts appointed by the British Home Secretary visited 46 works, and found only one using the precipitation process, and three the chamber process. They say: "While some of the substitutes are cheaper to make, and far less poisonous, yet they are far from equaling the Dutch lead as a pigment. Neither can they recommend other process than the old Dutch process for manufacturing the product."

Thus we see that until now no cheaper method has been found for producing the globular variety. The electrolytic process does produce the globular kind, and a finer variety even than the Dutch, so fine, in fact, that it was almost impossible to find a filter that would retain it. This probably accounts for the superiority of the electrolytic brand, as regards body and covering power over any other kind produced. Experiment shows that the pure carbonate will do as well as a mixture of carbonate and hydroxide. By the new process it is easy to make either the pure carbonate or mixture in any proportion of carbonate and hydroxide. This new process was invented in 1892 by Arthur Benjamin Brown, a chemist and mining engineer of Boston, and is only now made public.

AN ENGLISH ELECTRIC PUMPING PLANT.

An interesting example of the facility with which electricity lends itself to the transmission of power will shortly be seen on the premises of Smith's Dock Company, South Shields, says *London Engineering*. There is at present there a floating dock, upon which are erected engines and pumps for the purpose of pumping out the water when it is desired to float a vessel. The boilers which supply the steam are, however, on the shore, the connection being made by flexible steam pipes in a somewhat cumbersome and unsatisfactory manner. A new dock of the same type will shortly be installed, but in this case the power is to be transmitted from the shore by electric conductors. On the dock there will be erected eight 18-in. centrifugal pumps, each driven by an independent motor of 60 brake horse-power. The fan of the pump and the armature of the corresponding electric motor will be on the same vertical shaft, extending from the deck to the bottom of the floating structure, the weight being carried on ball bearings. The speed of rotation will be 385 revolutions per minute, and it is expected the plant will raise 16,000 tons of water per hour against a mean head of 18 ft. If this be realized, it will be possible to raise the dock with a ship of the largest tonnage in about half an hour. The generating plant will be fixed on shore at a distance of about 200 yards from the dock, and will comprise two sets of direct-coupled engines and dynamos capable of supplying 850 amperes at 500 volts. This current will be transmitted through Fowler-Waring armored cables to a cabin on the deck, from whence a single attendant will be able, by means of switches and regulating resistances, to control all the motors.

Wages in German Coal Mining.—In 1894 we find a large firm employing 9,000 persons paid the following average wages:

	Per day (eight hours).
	s. d.
Coal-getters.....	4 2
Stonemen.....	4 4
Repairers.....	3 3
Putters, etc.....	2 5
Horsedriers.....	2 0

The production of mineral per person employed (above and below ground) is about 290 tons per annum, at a cost of something like 5s. 9d. (\$1.38) per ton.

*Abstract JI, American Chem. Soc.

RIO TINTO COMPANY.

Mining on a large scale and most instructive in every respect has been carried out by the Rio Tinto Company with the best of professional advice and the experience of 23 years. Prior to that time the property had been for quite a long period in the hands and under the management of the Spanish Government. There was not the same incentive to economy of working, and there was not the same ability placed at the disposal of the Spanish Government, also there were probably many opportunities for little pickings, not to say corruption on a larger and smaller scale by the government officials. The result was that under this government management of a most magnificent property no profit or revenue could be obtained, but when sold and transferred to business people who meant to deal with the material available from a business-like point of view its success has never been in doubt.

In the early days of the history of the Rio Tinto mine not only having to pay the Spanish Government a large price for the property the outlays on capital account to put it upon a safe commercial basis were enormous, with the result that the capital account in shares and bonds ran up to a very large figure indeed. At the same time the shrewd firm of Matheson & Co., of London knew perfectly well the nature of the venture that they had engaged in, and after a period of suspense in which

leries by which the mine was worked not only by the present company, but by the Spanish Government before, the Romans before them, and the Carthaginians before the Romans.

The last report of the Rio Tinto Company has especial interest in the result of a most careful examination into the reserves of mineral, carried out with the aid of the diamond drill, and there is no doubt that the enterprise holds an absolutely unique position in mining. The reserves proved, and to quote the words of the chairman, Mr. Hugh Matheson, "now opened up," is not less than 135,000 tons; practically nearly enough for 100 years of work at the present rate of consumption of about 1,400,000 tons.

To quote from a recent report upon the Rio Tinto and other copper pyrites deposits in the south of Spain, by Mr. J. D. Delprat, in a paper read at the Baltimore meeting of the American Institute of Mining Engineers: "The principal features of the copper lodes are the following: They are nearly all lenticular masses of great lateral dimensions and unascertained depth. The iron cap, or as it is called in Cornwall, 'gossan,' varies in depth in different localities from 40 to 100 ft. or more. Below the 'gossan' is found the iron pyrites containing about 2 to 3% of copper. The deepest workings in the Rio Tinto mines, which are also the most extensive, have reached over 800 ft. without any marked decrease in copper contents, and the length and width of the Rio Tinto



OPEN CUT AT RIO TINTO.

few or no dividends were paid, and none at all from the profits of the operation of the mines, but only out of capital on the plea, that that expenditure of working capital would hereafter bring in profits.

The largest mining operations in the world as a rule are carried on in the most economical manner, and the Rio Tinto Company forms no exception to this rule. Their management is so good that their stockholders apparently are not very inquisitive as to the details of it, but it would be a positive advantage to the mining-engineering world to obtain detailed figures of their present cost of mining and removal of overburden. Not only would these figures be of advantage to many professional men, but they would also be of special advantage to large public questions that are being considered and works that are being carried out. For instance, the Chicago Drainage Canal as one of the latter, and the Nicaragua Canal in the future. When two prominent engineers, each of them highly thought of from his professional position and experience stand up and contradict the other upon the cost of doing certain work it would be very easy to apply the experience of such a company as the Rio Tinto to the case, were the fullest and latest figures available.

The scale of work at the Rio Tinto for the past year has been the mining and shipment of nearly 1,400,000 tons. In addition to which the quantity of overburden removed during the year was nearly 600,000 cu. m. Of course without further information it is impossible to give the exact tonnage that this measurement represents, but it approximates the handling of nearly 8,000 tons per diem.

The Rio Tinto Company has practically abandoned underground mining, and in our illustrations we give a good representation of the nature of their working, showing the railroad system in a corkscrew fashion from the lowest parts of the cut and the abandoned underground gal-

deposits are simply enormous, one of them being more than half a mile in length and in some places more than 300 ft. wide, absolutely clean and solid ore." The figures of cost given by Mr. Delprat are very interesting, the cost of removing overburden per cubic yard in 1891 being 15c., which is very conclusive in favor of the system of working by open cast adopted by the Rio Tinto Company. The limit at which the removal of overburden becomes unprofitable is generally put at four cubic yards of overburden for every ton of ore laid bare. The cost of quarrying the ore after having it laid bare may be taken as follows, exclusive of general charges: Breaking the ore, miners, \$0.038; materials (explosives), \$0.012; shops, \$0.004; tools, \$0.005; total, \$0.059. Loading into wagons, \$0.038; weighing, \$0.003; total cost per ton, put into wagons and weighed, \$0.10. While the breaking of ore in the open cast may cost \$0.07 per ton the breaking in galleries will cost on the average from \$0.52 upwards. When the ore is very hard it may reach \$0.85. A miner will break per shift in the latter case less than a ton, but in open cast 10 to 12 tons.

Iron Production in Germany.—In the month of February the German blast furnaces report a total production of 500,929 metric tons of pig iron, showing an increase of 66,225 tons over the corresponding month last year. There were 145 furnaces in blast during the month, an increase of five furnaces over January. The iron produced this year was graded as follows: Foundry iron, 68,333 tons; forge iron, 135,687 tons; Bessemer pig, 35,276 tons; Thomas pig, 261,633 tons. Thus, 59% of the total was iron intended for conversion into steel. For the two months ending February 29th the output of pig iron was 1,018,917 tons, showing an increase of 94,638 tons, or 10.3%, over last year.

TEXAS COAL-FIELDS.

Written for the Engineering and Mining Journal by R. S. Weitzell.

The bituminous coal-fields of Texas extend from a point on Red River, nearly north of Fort Worth, southwesterly across the state to the Colorado River. It is crossed by the several lines of railroad running out of Fort Worth and other points in the state west of Fort Worth, in a westerly, northwesterly and southwesterly direction.

The eastern margin of the lower stratum of coal is crossed by the Chicago, Rock Island & Texas Railway near Bridgeport, in Wise County, about 40 miles northwest from Fort Worth; by the Weatherford, Mineral

and Pacific Coal Company's mines at and near Thurber are the most widely known, because they are the oldest and much the largest. These mines have been in operation since 1886, the company having now four or five shafts in operation, employing 1,000 to 1,500 men and producing 1,500 to 2,000 tons of coal daily.

The other localities mentioned have but a single mine each with a present daily producing capacity of 100 to 200 tons each.

All these mines are operating in Stratum No. 1 of the Texas series, which ranges in thickness from 20 to 30 in., generally from 23 to 26 ins. The Stratum has a pretty regular dip to the northwest of from 60 to 80 ft. per mile, while the country rises in the same direction, so that it is but a short distance from the outcrop of the eastern margin, to where the coal reaches considerable depth beneath the surface.



LIXIVIATION PLANT.



OLD WORKINGS.

Wells & Northwestern Railroad near Rock Creek, in western part of Parker County, about 50 miles west of Fort Worth and 18 miles westerly from Weatherford, and by the Texas & Pacific Railroad, near Gordon, in Palo Pinto County, about 70 miles west of Fort Worth. From the three foregoing points fixed a reasonably close approximation to the line of the eastern margin of the field can be traced across any state map of Texas.

Notwithstanding there are at least seven lines of railways in the state that either penetrate or cross this field, yet there are but three lines on which any commercial mines are developed, viz., on the Chicago, Rock Island and Texas, at Bridgeport, the Weatherford, Mineral Wells and Northwestern, at Rock Creek, and the Texas and Pacific, at Thurber and Strawn.

The deepest shaft operating in No. 1 Stratum, is that of the American Coal Mining Company about 1½ miles east of Strawn (80 miles west of Fort Worth) on the line of the Texas & Pacific Railway, where the coal is reached at 320 ft.

The character of the overlying material of No. 1 Stratum is such that shafts can be sunk to it cheaper probably than to any other coal stratum in the United States, as there are (for the first 500 ft. above the coal, at least) no hard rock or quick sands to pass through, the material being mainly (probably about 90%) a so-called soapstone, easily and cheaply removed and impervious to water, and requiring very light timber lining, as the material will stand alone without any support.

Carefully-prepared estimate in detail by a competent mining engineer

and superintendent from present prices of machinery, material and labor (and fully verified by some actual experiences in recent shaft-sinking to this stratum) shows that \$20,000 is sufficient to sink a hoisting shaft 400 ft. deep, of sufficient cross-section to permit handling 600 to 800 tons per day through it, and with separate ventilating shaft, and equip it with all necessary head frames, chutes, screens, scalls, cages, hoisting and ventilating machinery for hauling 600 to 800 tons per day, and develop the underground working and equip it with track and cars sufficient to make the mine self-sustaining.

The prices of coal lands have not yet reached fancy figures, as plenty of the very best of them, immediately adjoining or in close proximity to the railway lines, can be had at from \$3 to \$10 per acre, the latter price applying to the very best farming lands in a fine state of cultivation lying right on the railway lines.

Some leases have been made recently in the vicinity of Strawn on terms more favorable to the lessee than would have been the purchase of the lands in fee at even the above-named figures.

THE COAL OF ALASKA.

Freeman H. Curtis was recently appointed postmaster at Seward, Coal Bay, Cook's Inlet, Alaska, the most remote postoffice of the United States. Mr. Curtis is an expert mining engineer. In an interview in *San Francisco Call* recently he said: "Both gold and coal have been known to be there for some time, but it is only within the past two or three years that any particular attention has been paid to developing those interests. The coal prospects give great promise, because of both the quality and quantity of the veins. The supply is virtually inexhaustible. It is of the Scotch Splint and English Cannel variety, being suitable for all domestic purposes and also for all kinds of stationary engines, including marine.

"There is sure to be increasing development in the coal fields on Katchemak Bay from now on. There are about 2,500 square miles of them and all extremely rich. As an example, there are at least 100 veins in sight within 15 miles.

Our company has about eight miles frontage on Coal Bay, and an area comprising 4,000 acres. We have taken out but little coal up to the present time, as most of our work has been confined to developing the mines. We have been at work now for about two years, have expended about \$60,000, and have had an average of 50 men employed. The operations being carried on mostly underground, we have been able to keep the men at work throughout the year.

"Now in the matter of climate. This is a region that is influenced by the Japan current. The average temperature during December, January, February and March last was 30 degrees above zero. The minimum during the winter was 18 below zero, while the average during the summer was 55 above.

We have brought two cargoes of coal down here and found no difficulty in disposing of them. The product was found highly satisfactory and we anticipate no trouble in marketing all that we get out. No attempt has been made to create a market for our coal, as we will not take it out in large quantities until our plant is thoroughly in shape and the work of development well under way. This will soon be the case. In Alaska alone there are about 40,000 tons of coal consumed annually. The Government uses about 15,000 tons, the canneries about 20,000, and about another 5,000 tons are needed for domestic and minor purposes. This coal now goes there from here and from the Sound ports. That we will be able to control the market for the kind of coal we will have to offer I am sure, for this coal is now selling for \$8 a ton, and we can afford to sell our product for \$4 a ton and make a fair profit."

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

WHAT IS NOT EVIDENCE OF SURVEY.—The voluntary affidavit of a county surveyor, acting unofficially, as to the location of lines of old surveys, filed in the general land office, does not become an archive, so that it can be authenticated by the commissioner, and thus become admissible as declarations of such party when he shall have died.—*Daniels vs. Fitzhugh* (35 Southwestern Reporter, 38), Court of Civil Appeal, Texas.

FOREIGN CORPORATION MAY BUY AND SELL MINING LANDS IN NORTH CAROLINA.—A foreign corporation created for the purpose of mining and milling gold and other minerals in the State may, if not prevented by its charter, acquire and dispose of real property in the furtherance of the objects of its creation.—*Barcello vs. Hapgood* (24 Southeastern Reporter, 124), Supreme Court of North Carolina.

INJUNCTION: MINING CLAIM.—Where the showing made by a party desiring a preliminary injunction tended to prove that the other party, as lessee of the owners of an interest in certain mining claims, in which the claimant owns the largest interest, was working such claims without the consent and against the wishes of the complainant, and not dividing the proceeds in good faith, such showing is sufficient to justify the injunction, in the discretion of the trial court, on the ground that the acts of the other party constituted an exercising of exclusive ownership by one tenant in common.—*Red Mountain Consolidated Mining Company vs. Essler* (44 Pacific Reporter, 523), Supreme Court of Montana.

FIRE IN MINE: CONTRIBUTORY NEGLIGENCE OF MINER.—Where a miner after having been notified of the outbreak of a fire in a mine in time to permit him to reach the shaft in safety, unnecessarily lingered in the mine, without notifying the men on the surface of his intention to do so, and it appears it would have been proper to stop a fan, which caused a circulation of air in the mine, or keep it running, according to the location of the fire, a non-suit, on the ground of contributory negligence should be granted in an action to recover for his death, as said miner had no right to assume that those in charge of the fan knew the location of the fire, though the jury also find that the negligence of the mining company in stopping the fan was one of the concurrent causes resulting in the death of such miner.—*Pugh vs. Oregon Improvement Company* (44 Pacific Reporter, 547), Supreme Court of Washington.

PATENTS RELATING TO MINING AND METALLURGY.

United States.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Scientific Publishing Company upon receipt of 25 cents.

WEEK ENDING MAY 5TH, 1896.

- 559,359. MANUFACTURE OF STEEL. James H. Carpenter, Reading, Pa. Filed November 30th, 1892. Process of making air-hardening steel, adding to the molten iron two to four per cent. of chromium, one per cent. of manganese and one to three per cent. of rutile.
- 559,433. ROCK AND ORE PULVERIZER. Carlus C. Birum, Utley, Wis., Assignor to the Green Lake Granite Company, Chicago, Ill. Filed March 1st, 1895. Combination of the body portion provided with the triangular recesses K in its sides near the periphery, and bolt-holes leading from the periphery into the recesses, with the removable rim, formed in sections I, and having bolt-holes adapted to correspond with the bolt-holes in the body portion, together with the bolts for securing the rim-sections in place.
- 559,593. PROCESS OF AND APPARATUS FOR EXTRACTING GOLD FROM ITS ORES. John G. Murphy, Middletown, Conn., Assignor, by mesne assignments, to Mary L. Murphy, same place. Filed July 10th, 1895. The process consists in reducing the ores to an impalpable powder by gentle attrition in a revolving cylinder from which only the thoroughly pulverized materials are permitted to escape by overflow into an amalgamating pan, amalgamating the pulverized materials within the pan with a quantity of water neither increased nor diminished during the process of amalgamation; and, finally, when the amalgamating action upon the ore has been completed, washing and diluting the pulp into a settler where the amalgam and impurities are separated.
- 559,619. ROTATING DEVICE FOR ROCK DRILLS. Henry C. Sergeant, Westfield, N. J., Assignor to the Ingersoll-Sergeant Drill Company, New York, N. Y. Filed August 15th, 1895. Combination with a circular ratchet, a rifle-bar and pawls attached to the bar for engaging with the ratchet to prevent the turning of the bar, of a cam applied to the bar for placing the pawls in inoperative relation to the ratchet, and permitting the turning of the rifle bar.
- 559,729. APPARATUS FOR PRODUCING ZINC AND LEAD BY ELECTROLYSIS. Richard O. Lorenz, Göttingen, Germany. Filed January 4th, 1895. An apparatus comprising a retort or vessel, which is oval in cross section, the retort being so inclined that the plane coinciding with its major axis and perpendicular to the sides of the vessel is inclined at an angle with a vertical line, anodes and cathodes sealed hermetically in the retort and having a like inclination, the anodes being arranged over or above the plane and the cathodes on the under side of and below the plane, the electrodes being formed of intersecting parts having openings between the intersections.
- 559,731. HOPPER FOR CHARGING COAL. Donald McDonald, Louisville, Ky. Filed August 15th, 1895. Combination with the base formed of upper and lower parallel plates spaced apart, connected at one side of the center by a tubular portion which forms the opening through the base, and connected at the opposite sides of the center by vertical posts or lugs, of the horizontally-turning hopper pivoted to the base and having a horizontally-flanged lower end resting on the upper plate of the base and adapted to close the base-opening when the hopper-opening is over the closed portion of the base, and a cover for the upper open end of the hopper and pivoted on the same axis with the hopper, a nut on the hopper-axis for bearing down on that side of the cover and means for securing the opposite side of the cover to the hopper.
- 559,779. ORE-CRUSHING MACHINERY. George Johnston, San Francisco, Cal. Assignor to the Edison Iron and Locomotive Works, same place. Filed September 24th, 1895. Combination with the pan and die of an ore-crushing machine formed with screen-openings, of the screens covering the openings, and the removable guard-plate adjustable to different heights as the plane of the die-ring may demand.

Great Britain.

The following is a list of patents published by the British Patent Office on subjects connected with mining and metallurgy:

WEEK ENDING APRIL 11TH, 1896.

- 24,861 of 1894. T. Parker, Wolverhampton, England. Treatment of zinc lead sulphides, by dissolving in hydrochloric or sulphuric acid, electrolyzing the solution for zinc and recovering the acid, and treating the residues for silver and lead.
- 9,332 of 1895. T. Twynam, London, England. Using the gases from a Bessemer converter as a source of nitrogen free from oxygen in the manufacture of cyanides from carbon alkali and nitrogen.
- 24,823 of 1895. H. Stinnes, Muhlheim, Germany. Improvements in coke ovens.
- 1,022 of 1896. A. Von Rad and J. Rosenfels, Augsburg, Germany. In making cyanides from nitrogen, carbon and alkali, the use of calcium carbide as a source of carbon, so as to allow of a much lower heat in the reaction.
- 3,984 of 1896. McGlewe Ore Concentrator Company, San Francisco, Cal. Detailed improvements in concentrators of the side bump traveling belt type.

WEEK ENDING APRIL 18TH.

- 7,560 of 1895. C. Hoepfner, Giessen, Germany. In the process of producing chloride of zinc from sulphide, mixing nitric acid with the acid and ore, so as to prevent the oxidation of the sulphide.
- 3,620 of 1896. J. W. Larnuth and B. H. Howarth, Manchester, England. Improvements in the mechanism of rock drills.

WEEK ENDING MAY 2.

- 24,837 of 1895. H. C. F. Stormer, Christiana, Norway. In electrolytic apparatus, in which mercury is used as cathode, arrangements for rapidly and completely separating the resulting amalgam in water, by keeping up a constant circulation of the amalgam in the water.
- 4,805 of 1896. J. P. Wetherill, Bethlehem, Pa. Magnetic separator, in which ferruginous substances not usually considered magnetic, such as hematite can be separated.

New Refractory Material.—Sternberg and Delettre have, according to the *Moniteur de la Ceramique et de la Verrerie*, invented a new process for the production of refractory material. They claim that by adding 10 to 15% of asbestos, either fibrous or pulverized, the ordinary material is made more fireproof and durable. The addition of asbestos is made while the clay, or whatever earth is used, is being mixed. Bricks produced from this material are said to prove excellent in the construction of converters, retorts, melting pots, etc.

Nickel and Cobalt in New Caledonian Ores.—Among the many gold medals being offered this year for competition by the Société Industrielle de Rouen is one for the best method submitted for quickly and accurately determining the percentage of nickel and cobalt in the ores of New Caledonia. Full particulars of the competition, as also samples of the ores, may be had from the Société Industrielle de Rouen (2 Rue Ampère, Rouen), to whom all competitive papers are to be sent in by September 30th next.

PERSONAL.

MR. HENRY JANIN, mining engineer, formerly of New York, now of London, Eng., is at present in New York City.

MR. HAMILTON SMITH, mining engineer, of London, Eng., is visiting this country in the interest of the Anaconda Company, Montana.

MR. EDWARD BATES DORSEY, mining engineer, of London, Eng., has been in New York City during the past week on his way to British Columbia.

PROF. W. H. SEAMON, of the School of Mines at Socorro, N. Mex., has returned from Washington, D. C., where he went to secure appropriations for the school.

MR. RICHARD PEARCE, the well-known metallurgist and general manager of the Boston & Colorado Smelting Works, at Denver, Colo., will sail for Europe this week, to be absent a few months.

MR. LETSON BALLIET, late professor of natural sciences, chemistry and physics at the Arkadelphia Methodist College, Ark., is at Salt Lake City for the purpose of examining the Mercur district. His office in the future will be at Helena, Mont.

PROFESSOR VAN DER NAILLEN, of the School of Engineering in San Francisco, Cal., left there recently for an extended trip through Europe. While abroad he will devote much of his time to the investigation of the latest developments in applied science, as well as to the securing of a complete equipment of newly developed and the new modern apparatus to facilitate experimenting in the higher branches of scientific research, as applied to electricity, mining engineering, assaying, etc.

MR. H. N. SIMS, for the past year acting manager of the Rockhill, Pa., Iron and Coal Company, has left that company and will open an office in Altoona, Pa., as a civil and mining engineer. He was assistant geologist on the second geological survey of the anthracite coal-fields of Pennsylvania for three years previous to 1885. Since that time he has been the mining engineer of the above company and was also engineer for the Shenandoah Furnace Company, of Shenandoah, Va., until the latter suspended operations.

OBITUARY.

EDWARD E. CLARK died in Salt Lake City, Utah, May 1st, aged 58 years. He had been engaged in mining throughout the West for 30 years, and at the time of his death was superintendent and part owner of the Eagle mine in the Camp Floyd district, Utah.

JOHN H. MCKELVY, president of the National Lead and Oil Company of Pennsylvania, died in Pittsburgh, Pa., May 13th, aged 59 years. He was widely known and prominently connected with numerous business enterprises and benevolent institutions.

THOMAS SEDDON, President of the Sloss Iron and Steel Company, died May 10th, in Birmingham, Ala., aged 47 years. He was a son of James A. Seddon, of Virginia, Secretary of War of the Confederate States, and was one of the chief developers of the mineral resources of the Birmingham district. He was one of the foremost coal and iron men of the South.

WILLIAM S. SLOAN, Vice-President of the Delaware, Lackawanna & Western Railroad, died at South Wilton, Conn., on May 10th, aged 36 years. He was the second son of Samuel Sloan, the President of the road. He graduated from Columbia College in 1862, and soon after became general freight agent of the railroad. He remained in that position until a short time ago, when he was elected vice-president.

JOHN C. DE LA VERGNE died in New York City on May 12th, aged 55 years. About 20 years ago he became interested in the Burr Brewing Company. With W. H. Burr, of this firm, he invented a refrigerating machine for use in breweries, and since that time Mr. De La Vergne has devoted most of his time to the business of manufacturing these machines. In 1883 there was a lawsuit between the partners in regard to the patents covering the machine, and it resulted favorably to Mr. De La Vergne, who then built a large factory and incorporated the De La Vergne Ice Machine Company, of which he was the president.

ENRICO CERNUSCHI, the famous political economist, died at Mentone, France, on May 11th. He was born in Milan in 1821, but later became a naturalized French citizen. He took an active part in organizing the Roman Republic of 1848. He afterward became a banker in Paris. M. Cernuschi came to the United States in 1877, and remained some months in New York, after which he traveled through the States. While in this country he contributed several articles on bimetalism to American newspapers. He was one of the delegates of France to the Monetary Conference of 1881, when the French and American delegates united in a declaration which Mr. Everts read to the conference, and he and the late Leon Say were among the vice-presidents of the Paris Monetary Congress of September, 1889. He is chiefly known as an ardent bimetalist, and had long been considered as the principal exponent of

the bimetallic theory, urging the ratio of 15½ to 1. He published a number of works on money, among which are "Mécanique de l'Echange" ("Mechanism of Exchange"), 1855; "Illusions des Sociétés Co-operatives" ("Illusions of Co-operative Societies"), 1866; "Silver Vindicated," 1876, and "Le Bimetalisme à Quinze et Demi" ("Bimetalism at 15½ to 1"). He was also the author of many pamphlets and essays. He was noted as a forcible, witty and brilliant writer, incisive in reasoning and dramatic in expression.

SOCIETIES AND TECHNICAL SCHOOLS.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL, MINN.—A regular meeting was held on May 4th. Papers in the matter of a bill to establish experimental engineering stations were referred to the government of the society. Mr. William de la Barre, of Minneapolis, read a paper on "Recent Improvements of the Water Power at St. Anthony Falls."

SOCIETY OF CHEMICAL INDUSTRY, NEW YORK SECTION.—The final meeting of the session will be held at the College of Pharmacy, 115 West Sixty-eighth street, on May 18th, at 8:15 p. m. Dr. G. Duisberg, director of the Farbenfabriken vorm. Friedr. Bayer & Co., of Elberfeld; Dr. C. Kolbe, Chemische Fabrik von Heyden, Radebeul-Dresden, and other foreign visitors will be present. The following papers will be read: G. Duisberg, on "The Education of Chemists"; Geo. W. Thompson, on "The Analysis of White Paints"; Frederick P. Dewey, on "Accuracy in Assaying"; F. L. Slocum, on "Estimation and Valuation of American Coal for Various Purposes."

ENGINEERS' CLUB OF ST. LOUIS, MO.—The special committee on convention of the American Society of Mechanical Engineers recommended that the club appropriate \$150 from its treasury to the entertainment fund. On motion so ordered. The secretary read a letter from J. C. Trautwine, Jr., asking the club's consideration of a bill now before Congress to establish engineering experimental stations. The matter was referred to Prof. J. B. Johnson for investigation and report. By request, Professor Johnson then read an abstract of Mr. J. W. Woermann's paper on "The Construction of a Low Crib Dam Across Rock River." The paper was illustrated by numerous photographs and blue prints. This dam is one of the structures of the Illinois & Mississippi Canal, known as the "Henne-pin Canal," and is intended to furnish slack water navigation in Rock River above the lower rapids. The exact location, design, methods of construction, foundations, material used, and the cost of the work, were fully given, together with a statement of the force employed and the time required to do the work. Prof. J. H. Kinealy then described a form of planimeter which could be made of a single piece of wire, showing the methods of operating it, and principles upon which it was based. Under certain limited conditions of service, and if used with great skill, quite accurate results were possible. After considerable investigation and study Professor Kinealy had worked out the mathematical theory of the instrument.

INDUSTRIAL NOTES.

In a few weeks T. J. Peter, receiver of the Alabama Iron and Steel Company, will start the rolling mill and nail factory at making cut rails.

The Louisville (Ky.) Forge Works, which have been shut down for some time, have again resumed operations. Two furnaces were blown in.

The Brown-Ketcham Iron Works Company, of Indianapolis, Ind., has lately issued \$100,000 bonds for the enlargement and improvement of its plant.

The Joliet (Ill.) Enterprise Works, recently purchased by the Consolidated Iron and Wire Company, has started up after an idleness of over three years.

An officer of the Burden Iron Company, Troy, N. Y., states that the plant will probably suspend operations for annual repairs the latter part of June.

Robert J. McIntyre, of Catasauqua, Pa., has received a contract for 400 iron columns, to be used in the construction of a B. & O. depot on Staten Island, N. Y.

It is reported that \$150,000 has been raised for the purpose of putting in operation the South Boston Iron Works, at Middlesborough, Ky., within 90 days.

An engine, boiler and entire milling plant, including a Huntington mill and a Woodbury concentrator, have been shipped from San Francisco, Cal., to Mollendo, Peru.

The Alcania Tin and Terne Plate Company, Youngstown, has secured the patent rights for making pure lead coated plates, which it will begin to place on the market shortly.

The Girard Stove and Foundry Company, of Youngstown, O., is erecting a 15 ton air furnace to facilitate the manufacture of rolls. A frame addition will be erected to cover this department.

The Watt & Brothers Steel Company, York, Pa., was recently granted a charter with a capital stock of \$30,000. It will shortly commence the erection of a plant and will be open for bids on new machinery, etc.

J. A. Little, A. W. Pollock, W. H. Borland and others of Washington, Pa., have organized a company for the manufacture of steel tools, and will apply for a charter at once. The capital of the new company is \$20,000.

The Pittsburg Reduction Company has recently purchased the property formerly used by the Excelsior Glass Company as an addition to its plant at New Kensington, Pa. The new property will be utilized as a crushing and separating works.

The Anna Furnace, at Struthers, O., purchased last October by Runyon, Stubbs & Co., of Cleveland, from the Brown-Bonnell Iron Company for \$150,000, secured the plant on May 1st, as per agreement. The furnace was rebuilt last year and has a capacity of 250 tons daily.

The Iron City Brick and Stone Company, of Pittsburg, Pa., is applying for articles of incorporation to manufacture building brick, fire brick, etc. Grant Dibert, Francis J. Torrance, William H. Robinson, Francis G. Gardiner and John M. Kennedy, Jr., are the incorporators.

The Fort Pitt Bridge Works, organized by Geo. W. Eberhardt, G. C. Dellenbach and others have secured the plant formerly operated by E. M. Butz & Co., known as the Pittsburg Architectural Iron Works, at Canonsburg, Pa. The plant was put in operation last week.

Wm. Kavanaugh & Co., of Harmony, Pa., manufacturers of drilling and fishing tools, iron forgings etc., will remove their plant to Zelenople, where an establishment 50x150 ft. will be erected. The building will be of brick and iron and will contain 6 forge fires 3 steam hammers, lathes, planers, etc.

After exhaustive tests, extending over several months, the Weidmann Silk Dyeing Company, of Paterson, N. J., have executed a contract with the Pneumatic Engineering Company, 100 Broadway, New York, for a pneumatic system of pumping. Compressed air will be furnished by two of Rand Drill Company's 16-in. x 14-in. x 22-in. class C air compressors.

Mr. M. B. Dodge, manager of the Dodge Mining Machinery Company, of San Francisco, Cal., has recently fitted up the offices formerly occupied by the Union Iron Works, Mission and First streets, as the office and salesrooms of his company. The company will carry a full line of rock crushers, mills, concentrators, amalgamators and other mining and milling machinery.

The United States Projectile Company, of Brooklyn, N. Y., is erecting a new building to meet the large demand for its products. The new building will be 100 ft. wide and 450 ft. long, of steel skeleton structure throughout. The steel work for the building has been designed and will be erected by the Berlin Iron Bridge Company, of East Berlin, Conn. The trusses have a clear span of 100 ft.

On May 20th next Strong & Ireland, auctioneers, of 60 Liberty street, New York City, will sell for Percy L. Klock, assignee of the Geo. L. Colegate Company, at the New York Real Estate Salesroom, No. 111 Broadway, the selling rights agreement under patent No. 475,482, for the exclusive sale of the swinging ball lightning arresters, also letters patent No. 284,400 relating to cloth steepers for copying presses.

The Pultney Foundry and Engineering Company has succeeded to the business of the Pultney Foundry and Engineering Works and at a meeting of the stockholders last week the following officers were elected: President, Wm. Pultney; vice-president, Robt. Gray; secretary, Robt. Gibson; treasurer and general manager, Robt. Pultney. The company's plant has lately been improved by adding a 20-ft. boring mill, built by the Bates Machine Company, Wilmington, Del.

Samuel A. Sague and Chas. E. Westhafer, Cleveland, and Wm. A. Taylor, Laurel E. James and Chas. H. Howland, of Cuyahoga Falls have organized the U. S. Standard Drawn Steel Company and will locate at Cuyahoga Falls, O. The offices of the company will be in Cleveland, O. Arrangements are being made for the Camp machine shop at Cuyahoga Falls for manufacturing purposes and it is the expectation that 50 men will be employed. The product will be drawn steel tubing and all drawn shapes, hexagons, squares and special sections, and it is the intention to engage also in the manufacture of brass and copper tubing.

The annual meeting of the stockholders of the Central Electric Company was held in Schenectady, N. Y., on May 12th. About the usual number of stockholders were present in person and by proxy, in all representing a little above 200,000 shares. The directors elected are as follows: Oliver Ames, 2d, Jefferson Coolidge, Jr., C. B. Coster, Thomas A. Edison, Eugene Griffin, Gordon Abbott, F. S. Hastings, Henry L. Higginson, George P. Gardner, J. Pierpont Morgan, Robert Treat Paine, 2d, Geo. Foster Peabody, C. A. Coffin. Officers for the ensuing year will be elected by the new board of directors.

The Parke & Lacy Company, of San Francisco, Cal., reports sales as follows: 100 ft. x 14 ft. Ropp straight line furnace to Philip Argall for the Metallic Extraction Company, Cyanide, Col.; a 10 in. x 12 in. double cylinder double drum hoisting engine, 2 40 H. P. boilers, feed pump heater and sheaves, complete hoisting plant, to the Amalle

Manufacturing Company, Amalie, Kern County, Cal.; 3 drill compressor, Ingersoll-Sergeant, plant with drills, etc., complete to the Oneida Gold Mining Company, Jackson, Cal.; 2 high speed coal hoisting engines, to the Beaver Hill Coal Manufacturing Company for its San Francisco bunkers.

The well-known firm of W. J. Clark & Co., manufacturers of the Salem Elevator Bucket, has recently been incorporated under the laws of Ohio, under the name and style of The W. J. Clark Company, with a paid-up capital of \$100,000. There is to be no change in the line of management of the business, except that with its greatly enlarged plant and improved facilities, the new company will be able to execute orders for buckets, or for sheet and plate metal work, much more promptly than heretofore, and thereby increase the business very considerably. Mr. W. H. Clark is president and treasurer, and Mr. W. J. Clark is vice-president and business manager of the new company.

TRADE CATALOGUES.

Mr. Timothy W. Sprague, associated with Mr. Charles Henry Davis, Consulting Engineers of New York and Boston, has just issued a pamphlet containing facts and figures of interest to mining men. The pamphlet contains, among other things, tables, one giving the approximate sizes and costs of power plants for coal cutting and haulage, and another giving particulars relating to mining locomotives.

Messrs. R. D. Wood & Co., of Philadelphia, Pa., the well-known constructors of gas and water-works, have issued a most artistic and complete catalogue on water and gas-works appliances. Typographically the book is entirely worthy of emulation, and the attention of manufacturers and others who may be contemplating the issue of catalogues is drawn to it.

Under the heading of "Water-Works," may be found descriptive matter, tables, valuable data and handsome half-tone illustrations, interesting alike to professional and to lay readers. Price lists of the various appliances accompany the text. Under "Gas-Works" there is almost a complete treatise on the subject, with full descriptions of the chemical and mechanical features of gas-making, illustrations, tables, etc. The latest appliances manufactured by the firm are described at length. Any one interested in gas or water-works would do well to write to R. D. Wood & Co. for this book.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" of what he needs he will be put in communication with the best manufacturers of the same.

We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufacturers in each line.

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

GENERAL MINING NEWS.

NEW OIL WELLS.—The report of the Oil City Derrick for the month of April gives the completion in New York, Pennsylvania and West Virginia fields of 569 new wells having a production of 10,640 bbls., daily. There were 1,143 wells under the drill at the end of the month. The Buckeye field in Ohio showed 432 new wells completed, having a production of 9,335 bbls. per day, and 569 new wells in progress. The Southeastern Ohio field records the completion of 45 new wells with an output daily of 413 bbls., and 72 wells being driven at the close of April. In the Indiana field 136 wells with a production of 2,825 bbls. were completed and there were 166 wells drilling at the end of the month.

OIL EXPORTS.—The Bureau of Statistics, Treasury Department reports the exports of mineral oils from the United States in February as follows: Crude oil, 8,063,139 gals.; naphthas, 59,914 gals.; illuminating, 53,241,457 gals.; lubricating and paraffin, 4,487,653 gals.; residuum, 43,176 gals.; total, 65,995,339 gals., a decrease of 10,989,389 gals., as compared with February, 1895. For the 10 months of the current fiscal year from July 1st to April 30th, the total exports of oil were 716,672,313 gals., showing a decrease of 31,502,548 gals., or over 4%, as compared with the corresponding period last year.

CALIFORNIA.

BUTTE COUNTY.

(From Our Special Correspondent.)

MAGALIA.—Roger Johnson has sued N. D. Rideout for an accounting of the Magalia stock. Mr. Johnson represents W. C. Pershbecker, the original owner of the mine. In June, 1890, Pershbecker turned the property over to Rideout to sell. They were to divide equally everything that should be received above \$200,000 up to 1893, and after that Rideout was to keep \$90,000 of whatever amount he should sell the mine for. Mr. Johnson charges that, instead of selling the mine, Rideout sold 10,000 shares of it, and he demands an accounting on the 0,000 shares, which he says are worth \$1,000,000.

This drift mine embraces 400 acres of patented land located 2½ miles from Centerville.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

GRANITE.—This mine, which has been lying idle for the past 16 years on account of litigation, is now being re-opened. There is a 10-stamp mill on the property.

MACHU.—At this mine, near West Point, the new hoisting plant is in position. Twenty-five men are employed in three shifts and work is being pushed. The ore looks well.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

READY RELIEF.—The owners of this mine have decided to lay a new pipe line to bring water from a spring 6,000 ft. distant. The increased development of the Ready Relief and Redman mines render the increase of the plant a necessity. This property is located in the Julian district.

SHASTA COUNTY.

(From Our Special Correspondent.)

HARRISON GULCH.—This mining district, which is located about 60 miles southwest of Red Bluff, is the scene of great activity. A great many claims have been located, all of which with few exceptions show free milling ore. The last run of 165 tons from the Lucky Baldwin and Gold Hill mines netted almost \$9,000 in free gold. These mines are under bond to San Francisco parties.

NICHOLS.—This property, on Little Backbone Creek, near Kennet, consisting of 16 claims, has been bonded by George Senn and Senator Gleaves. The main ledge runs directly into the mountain, and is said to be 5,000 ft. long by 145 ft. wide. The ore contains gold, silver and copper, and is of a smelting character. The ledge is supposed to be a continuation of the Iron Mountain. There are six tunnels from 60 to 90 ft. in length in the ore body.

SONOMA COUNTY.

(From Our Special Correspondent.)

JOHN GRIMMER.—At this claim, in the Pine Flat district, 15 miles north of Healdsburg, development work has progressed favorably during the past month. The ledge runs well in quicksilver, and also carries gold and silver. It is said that \$20,000 has been refused for the property.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

APP.—This mine is located one mile south of Jamestown. The 20-stamp mill is running on \$5 ore from the old dump, which can now be worked profitably. The drifts south of the shaft, from the surface down to the 800-ft. level, show a large quantity of good ore. In some places the chute is almost 40 ft. wide. The plant is to be increased by a 40-stamp mill. There are 45 men employed.

COLORADO.

BOULDER COUNTY.

(From Our Special Correspondent.)

ADIT.—This company, working the California-Dew Drop, has been driving the tunnel at the rate of 120 ft. per month, and will soon reach a point parallel with that where the great ore was found in the old California lode in early days. The tunnel will be 5,000 ft. in length and will tap the Dew Drop vein at a depth of 300 ft. below the present Dew Drop workings.

AMERICAN.—A contract has been let to run a 50-ft. drift on the American, following the vein.

ARGO.—Pay ore has been struck and the first consignment shipped to Boulder this week, which will be followed by regular shipments.

ATCHISON.—Barney Joyce has struck a seam of 6-oz. gold ore, and has a force of men at work pushing development.

BOULDER RECOVERY COMPANY.—This company will at once start up the Coburn cyanide mill at Magnolia, and will also immediately erect two or more 50-ton per diem plants of a similar character at Four Mill and Left Hand.

SLIDE.—J. W. Nicholson has assumed complete charge of operations at the slide, and a force of 50 men is employed developing the property. Some streaks of rich ore are in sight, but a great amount of work and a large outlay of money will be required to place the mine on as firm a footing as it was six months ago.

SMUGGLER.—Bartlett & Davis, lessees on the Smuggler, are still working the tunnel level and mining high-grade ore. Shipments continue regularly.

STAR.—Several sets of sub-lessees are taking out good ore, some of which is very rich, leaving a handsome profit after deducting the royalty, which is at the rate of 25%.

STARTER.—Mr. Dickerson will resume operations this week with a large force of men on the Starter. The old workings will be abandoned, and attention turned toward virgin ground.

UTICA.—A gold retort valued at \$6,000 was taken to Denver this week, being the output of the Utica for April. New machinery was recently put in and the workings are in good condition.

WABASH.—Although a recent location, the Wabash has revealed a large body of pay ore, similar to that of the Housatonic, and equaling the latter in value. It is operated by Samuel J. Evans.

WHITE HOUSE.—Martin et al. shipped 4 tons this week of very rich ore from a vein recently disclosed.

WHITE PINE.—The machinery has been put in working order and operations are progressing quite satisfactorily. The shaft will probably reach a depth of 1,000 ft. before the vein is cut, and drifting will then begin.

YELLOW GIRL.—The whim is in running order and the workings are being cleaned out and repaired preparatory to resuming work on the rich pay streak.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

SANTA FE.—The long drawn out litigation between contending owners of this mine will be heard in the District Court this month, and whichever side wins, they will start up work in the mine. Lessees have recently been working the upper levels, and taking out a high-grade mineral.

SEATON.—This mine, on Seaton Mountain, is reported to have been sold through Denver parties for \$500,000, but particulars regarding it are not now obtainable. Although one of the oldest locations on the mountain, the mine has but recently come to the front as a big producer.

SENATOR.—The principal stockholders of the Union Leasing Company, of Leadville, are operating this group of 23 claims near Dumont and within the past 10 days opened out a large body of mineral through a crosscut tunnel. For some time they have been paying all expenses from the handling of the lower grade ores treated at the Drummond and Donaldson mills.

SHAFTER.—This mine has been producing a large tonnage of mill dirt, enough to keep the Mixsell stamp mill running night and day. In driving an east strike a smelting streak opened out and tests are returning over \$100 a ton. New York business men own the mine.

SILENT FRIEND.—The new owners of this mine are arranging for the erection of a big concentrating plant on Clear Creek for the purpose of treating ores now blocked out in the mine. In starting an upraise a rich smelting streak 2 ft. wide was cut, assays from which ran high in gold.

SILVER AGE.—The St. Louis owners have arranged for sinking a new shaft near the mouth of the tunnel and are now putting up a plant of machinery. Some time ago a winze was sunk in the tunnel and levels extended both east and west, but to the east a large ore chute was cut and it is for the purpose of reaching this that the shaft is to be sunk.

SILVER HORN.—Some time ago parties working this property found the mineral streak becoming smaller in the adit level, and after driving it forward for several months they abandoned all work. A recent examination shows that they left the lode and were following a feeder. A test has just been made and that mineral overlooked is the richest ever found in the lode. Denver parties expect to take charge of the mine and work it with a large force of men.

SILVER QUEEN.—After being idle for several years the owners of this mine, near Idaho Springs, intend starting it up again and working it in a business-like manner. The mine in its day was one of the heaviest producers in the district, but development work was not kept up and it was allowed to go down.

SILVER RING.—Lessees working this mine have driven two adits for 700 ft. each and in the upper a nice pocket of silver-bearing ore has been cut. It returns over \$400 a ton.

SUN AND MOON.—The new Cleveland owners are preparing to work this property on an extensive scale. The water has been taken out of all shafts and sinking and drifting are now under way.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

PHARMACIST GOLD MINING COMPANY.—This company held its annual meeting at Colorado Springs last week, and elected the following directors: Sylvester Johnson, A. D. Jones, A. Hemenway, J. W. Miller and C. K. Holliday. F. H. Pettingill, one of the old board, declined to stand for re-election. The report showed the company about \$12,000 in debt, but with good prospects for the future.

(From Our Special Correspondent.)

ARCADIA MINING COMPANY.—The Lone Star, owned by this company, adjoining and in conflict with the Abe Lincoln has also erected a steam hoist on its shaft, 80 ft. deep, and is prepared to do development on a moderate scale.

CALEDONIA.—This property is still being developed by the MacMasters Bros. with gratifying results. The vein is being broken and sent to surface and being sorted for the smelters.

CHRISTMAS MINING COMPANY.—At its annual meeting the company decided to erect at once a steam plant and suitable ore bins. The shaft is 185 ft., and a drift has been extended north 80 ft. all in ore of a low grade from 1 to 2 oz. Capt. Samuel Rowe, of Michigan, has been appointed manager, in place of Mr. Sampson recently deceased.

C. O. D.—This mine has been closed for a week on account of the big influx of water. The capacity of the pump was reported 600 gals. per minute, but it was altogether too small for the volume of water that was encountered, and large pumps have been ordered and will shortly be at work. No shipments have been made of late.

CRIPPLE CREEK CONSOLIDATED MINING COMPANY.—The May Queen, on Womack Hill and owned by this company, is driving single track tunnel through the hill from south to north. A tunnel has been nearly driven through the hill from east to west. Mr. Walter Head has leased a portion of the May Queen, and is now erecting a steam hoist on a 70 ft., it being his intention to sink deeper and prospect south. Some rich though very small pockets of ore have been found on this hill.

E. POSTER GOLD KING.—This property, on Gold Hill, is being developed by a shaft worked three shifts; the present depth of shaft is 165 ft. Shortly a drift will be extended north, to intersect the ore shoot which is supposed to be in that direction.

GENEVA.—This mine, on Gold Hill, and worked by Tuth & Penrose, is a steady shipper to the Cripple Creek sampler, sending 8 tons a day. The shaft is being sunk below the 300-ft. level. There are 20 men employed.

ISABELLA MINING COMPANY.—The Buena Vista, owned by this company, last month shipped 980 tons of \$57 ore or nearly \$56,000 for April, the largest quantity shipped in one month, showing an increase of 100% over April of 1895. The mine now employs about 115 men.

JEFFERSON MINING COMPANY.—The Mattie L., on Gold Hill, owned by this company, is shipping about 10 tons per day of ore, which averages from \$100 to \$150 per ton. Only one slope is being worked at present, but in the course of a week or two three stopes will be at work. A new hoist has recently been added. The company employs 43 men.

JUBILEE.—This mine, on Globe Hill, intersected a new vein at the 80-ft. by means of a 35-ft. cross-cut. The shaft has been sunk 160 ft. The whole of the crosscut was mineralized, but too low grade to be of value.

KEYSTONE.—This property is under lease and bond to Messrs. Fogleman & Smith, who made an important strike during the past week. The property had been under lease and bond for 12 months, but the lessees refused to take the bond up, and the present lessees in driving less than 2 ft. found the phonolite dike which carries both gold and tellurium.

MARINETTE MINING COMPANY.—The Abe Lincoln, on Globe Hill, owned by this company, has sunk a shaft 125 ft. deep, it being the intention to sink vertically 300 ft., and to thoroughly prospect the ground at that depth. The property is well equipped with steam plant and necessary buildings.

PORTLAND MINING COMPANY.—This property, on Battle Mountain, is again shipping large quantities—about 100 tons daily—of ore from its various properties. The new machinery has not yet been started, but it is stated that it will be in running order next week. The directors met and declared a dividend of 1c. per share, or \$30,000 for the month of May. The dividend will come opportunely to our business men who suffered during the fires.

SQUAW MOUNTAIN TUNNEL COMPANY.—The tunnel has pierced Squaw Mountain 1,400 ft. in a southeasterly direction. The company is now sinking a winze on the first vein that was discovered. A small shipment was recently made which netted \$181 per ton.

TRAIL.—This mine, on Bull Hill, is being actively worked by a Mr. Perry, of Denver, who employs 38 men all of whom are engaged in development work. Steam drills are being used in the sinking of the shaft. The object is to keep work well pushed ahead, until communication is effected with a certain shaft, when large shipments will be made regularly.

GILPIN COUNTY.

(From Our Special Correspondent.)

GALENA.—This mine, above Central City depot, is to be worked again. The shaft is 600 ft. deep, and the drifts are said to show a good deal of concentrating ore of fair grade, but little of which has been stopped. This property has been idle for the last 10 years.

MAMMOTH MINING COMPANY.—This company is starting a tunnel from Packard Gulch, on the Waterberry claim, covering the vein of the same name. The tunnel will be driven in with air-drills to the junction with the Mammoth vein, which latter it is proposed to work from it. Work in the Mammoth deep shaft will be practically discontinued, the pumps being merely kept going to hold the water. Possibly, also, diamond drill borings will be made on each side of the main vein, to test the branch veins supposed to exist.

MARY MILLER.—Messrs. Drake are expecting to start the tunnel again shortly, and drift toward their ground on the Williams vein, which latter should be out at a depth of 1,100 ft. The tunnel starts from Clear Creek, below Black Hawk, and is already in some 2,000 feet. Like most other veins on the outskirts of the main Gilpin ore-belt, the Mary Miller carries high-grade silver ore, which is shipped to the smelters.

VENDOME MINING COMPANY.—This company has placed a contract with Messrs. McFarlane & Co. to build a 30-stamp fast-drop mill at Nevada, just above the Hubert Mill, also supplied by the mines under the same management. The mill is to be completed by August 1st, is to be provided with double bumping-tables, and an unusual length, 16 feet, of silvered plates. The contract price is said to be \$20,000.

WASHINGTON.—This mine, in Lake Gulch, owned by Messrs. Drake, has been sold to Chicago capitalists for \$55,000, of which \$20,000 is said to have been paid over for possession. The property comprises three patented claims, the Washington, Bonanza and Washington Extended, covering the same vein for 3,500 ft., from Lake to Russell Gulch. The mine has hitherto been worked by lessees, and the production has been mostly smelting ore. Considerable mill-dirt has also been met with, but this, while assaying well, is not free-milling.

GUNNISON COUNTY.

COLORADO FUEL AND IRON COMPANY.—An important case was concluded in the District Court at Gunnison last week, wherein Roger C. Evans received a jury verdict of \$35,000 damages from this company. Evans has just come into possession of a valuable tract of coal land at Crested Butte by virtue of a coal filing in 1880. Owing to the fact that a portion of it was embraced in the Ute reservation the Commissioner General of the land office suspended final purchase of the land for the time being. A year after his filing Byron McMaster filed on the same land and purchased it for the Durango Trust Company. In 1892 Roger began suit in the local land office to recover the property, and the case went before the Secretary of the Interior. Some years ago this land was leased for 99 years to the Colorado Fuel and Iron Company, and they have taken out about 150,000 tons of coal, covering an area of 80 acres. Roger brought suit to recover damages and was awarded the verdict given above. The jury concluded that the coal in place was worth 20c. per ton.

HINSDALE COUNTY.

SILVER CORD EXTENSION.—This mine near Capital City, is being developed by tunnel, which is now in for a distance of 90 ft., with cross drifts run in each direction, developing a strong vein. There is a pay streak said to be several inches wide.

LAKE COUNTY.

(From Our Special Correspondent.)

AIMEE.—Several parties are figuring with the owners for a lease. This property was once a famous producer, but for some time has lain idle. The shaft is down 580 ft.

BELGIAN.—Daily shipments by the lessees from the Flagstaff ground are light but regular. A rich strike was made this week but it proved to be only a streak.

CATALINE.—This property lies near the Big Six and lessees have opened up ore in the shaft. This has not yet been developed to any extent.

COLUMBIA GROUP.—The lessees have just placed a big new plant of machinery on the ground. They are developing a fine streak of ore, some of which assays as high as 5 oz. gold to the ton.

CONGRESS.—These people are after the rich shaft of the Northern Company. They are now down 500 ft., and have encountered some fine contact matter.

FIRST NATIONAL.—Arrangements are under way to resume operations. A first-class plant of machinery is in position.

FOUR PER CENT.—Lessees have opened up a fine body of iron ore, but the market is too dull for shipments at the present time.

HOPE.—Some lead ore has been encountered; also a good streak of low-grade ore that assays from 2 to 20 oz. silver.

LONDON MINE.—It is learned here that this property, located on Mosquito Pass, is to resume operations shortly. The mine is developed by a tunnel and was just beginning to pay when the decline in the price of silver stopped operations.

NISI PRIUS.—This ore right along has been a sulphide, but this week the lessees opened up a fine streak of chlorides which assays high. No assay figures, however, were given out.

PREMIER MINING COMPANY.—Articles of incorporation were filed by New York parties on May 9th. The incorporators are: Samuel Williams, B. F. Connor, L. W. Baldwin, John J. Tracey, J. F. Workum and S. F. Jarvis, all of New York, and Geo. W. Curtis, of Leadville. Capital stock, \$100,000 divided into 100,000 shares. Principal office in New York; offices in Chicago and Leadville.

REX GOLD MINING COMPANY.—The personal property of this company was sold this week for \$2,900. The mining property will be sold May 16th, the entire sale being a sheriff's levy to make good a judgment of over \$36,000, held by J. J. Brown. It is the general belief that when Mr. Brown gets the property he will push important development work.

RIALTO MINING COMPANY.—This company, headed by N. M. Esty, H. C. Mitchell and W. Koberle, have leased the Walnut, Chestnut, Experiment and Pyrenees claims on Carbonate Hill, and it is thought that they intend sinking another deep shaft.

ROBERT E. LEE.—The new lessees have begun operations. Shipments of iron ore have been commenced. Drilling for the second contact will be started this week.

SELMA.—Operations ceased temporarily a few weeks ago, but are to be resumed this week.

SOUTH EVANS GULCH.—During the past few weeks activity in this section has been very noticeable. This big stretch of land, extending from Little Ellen hill on the south to Big Evans on the north, is dotted with new shaft houses, while several good finds have been made in the territory.

GEORGIA.

LUMPKIN COUNTY.

CROWN MOUNTAIN.—A test run of 5½ tons from this mine recently gave a yield of slightly more than 1 oz. to the ton.

FINDLEY.—This mine is being developed, and a large body of ore is now exposed on the hill above the mill.

FREE JIM.—Eb. Crisson is finding some gold on this lot, says the Dahlonega *Nugget*. A test run of 18 tons yielded 6 oz.

IDAHO.

BOISE COUNTY.

SUMMIT.—This mine is now owned by Denver men who have commenced sinking a shaft to develop it at the depth of 300 ft. The ore body is from 8 to 10 ft. in width.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—On May 1st a strike was declared on by the miners in this mine. The men struck for an increase of 50c. per day, which the superintendent said he could not grant until he heard from the company in London. The wages heretofore paid were \$3 for miners and \$2.50 for shovelers. This strike threw 150 men out of employment.

TRADE DOLLAR.—This mine, at Silver City, shipped seven bars of bullion recently. This mine employs over 100 men and ships a carload of concentrates each month. A gang of men are now at work grading for the new mill to be erected at Boonville, four miles below Silver City.

KANSAS.

MONTGOMERY COUNTY.

MURPHY OIL WELL.—This well, near Table Mound, a sheer wildcat, is developing into one of the best wells yet found in the vicinity. Four wells were located in about 1,000 ft. of it in various directions. The Bayliss well, 1,000 ft. almost due west, was expected to be an oil well. Instead, it proved to be a big gaser. The Kingle well, 1,000 ft. northeast, was expected to be an oil well, but it, too, proved to be a big gaser. Sutherland well No. 2 was drilled in territory where nothing but very small wells had been found before, and it is reported to be making 60 bbls. daily. Mrs. Eaton has about 11 acres of land lying just a few hundred yards southwest of Redington's best wells, and between the Mann and Oliver wells and the Stillwell well, appearing to be the best territory in the field. A well was drilled on the southwest quarter of her tract and came in a salt water well with a fair flow of gas. The Forest Oil Company recently drilled another well a little northeast of the center of the tract, and it started off as natural as a good producer. A 40-quart shot was put in it and it produced more oil in the first 24 hours than any well yet found.

MICHIGAN.

COPPER.

QUINCY MINING COMPANY.—In requesting proxies for the annual meeting of this company, to be held June 3d, Secretary Tod says that the concurrence of two-thirds of the stockholders under the laws of Michigan is required to authorize the proposed amendments to the articles of association in order to perfect the increase in the capital stock of the company in conformity with the resolutions adopted at the special meeting of the stockholders, March 15th, 1894.

MINNESOTA.

(From Our Special Correspondent.)

NEW EXPLORATIONS.—A large number of explorers, some under employment by a company that is endeavoring to find out what there is in the region, and others simply to "catch on," is heading for the north shore mineral district, down Lake Superior from Duluth. The existence of all kinds of minerals is claimed for the district, chiefly nickel and iron.

ORE SHIPMENTS.—Shipments of iron ore from the ports of Two Harbors, Duluth and Superior last week were about 90,000 tons, of which Two Harbors took a little more than Duluth, and Superior only about 6,000 tons. From Two Harbors shipments are so far almost entirely confined to the vessels of the Minnesota Iron Company and allied interests, showing that the independent fleet is not yet done with the rush of grain. The chartering for the week has been very heavy, and no less than 5,000,000 tons of ore is now covered for the season at rates fixed by the vessel interests connected with the ore pool.

SAULT STE. MARIE.—It is now hoped that the second American canal at the Sault Ste. Marie, the outlet to Lake Superior, will be ready for use by August. This canal will permit the passage of vessels out of Lake Superior with as large cargoes as they can carry over the connecting channels at the foot of Lake Huron, about 15½ ft. at the present time, and will permit a use of 20 ft. of water when the connecting channels are deepened to allow it. This will add about 35% to the iron ore fleet of the lake. There was a blockade at the canal last week, which was only raised by the opening of the Canadian canal, and then not for three days, so considerable was the pressure of vessels. There will doubtless be numerous occasions this summer when there will be costly and long delays at the canal, both for ore and other shipping. This canal last year passed, according to the report that has just

been issued, 12,502,000,000 ton-miles of shipping, and the freight paid was \$14,239,000. The average freight rates were 1.14 mills per ton per mile.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

AUBURN MINING COMPANY.—This company has shut down its mine, throwing about 100 men out of work. The mine has about 50,000 tons in stock and this will be shipped at once. No date for resumption is set. Winston Bros. continue their stripping operations, begun last week.

COMMODORE MINING COMPANY.—Shipments have begun on a small scale at this mine from the new developments. Work begins soon on a three-compartment shaft, which is to be sunk at an incline of 60° and will be 400 ft. deep.

CLEVELAND LANDS.—At these lands, under option by the Humphreys interests, six pits have been sunk into ore in the past few weeks. The new mine lies close to the Franklin and northeast of the town of Virginia. There is a surface over the ore of from 15 to 50 ft., and the ore is of an excellent Bessemer grade. Work will be continued and increased.

EVELETH TOWNSITE.—The explorations carried on here for the past few months with a view to seeing whether there was enough ore to open a mine have been stopped, it being proven that the ore was not in sufficient quantity.

FRANKLIN MINING COMPANY.—From this group of mines the daily shipments are now 2,500 tons and about 1,500 tons are daily hoisted. Tracks are being laid to the Victoria and about 500 tons a day will be added to the shipments on their completion. No. 2 shaft of the old Franklin will soon be in working order again.

HALE MINING COMPANY.—At this mine W. E. Dorwin has begun his contract to ship to the Thomas Iron Company 75,000 tons of ore.

LONGYEAR & BENNETT.—This firm has struck another mine, this time in section 28, 58-20, where a drill has gone into ore 229 ft. and is still going down. There is some 70 ft. of surface over the ore, which is of high grade. A number of excellent prospects have been found in the same vicinity, and the find is considered of considerable importance as settling a basis of ore elsewhere.

NORMAN IRON COMPANY.—This mine is shipping about 400 tons, and, so far as the public knows, will continue this pace during the season. It has 14,000 tons in stock, which will be shipped later in the season.

SECURITY EXPLORATION COMPANY.—This company has sunk into 208 ft. of ore in the old Shaw mine close to the Virginia, recently bought by the Minnesota Iron Company. There is a mine on the Shaw with very light stripping and of a good quality of ore in the deeper workings. This property was under lease to the Consolidated Company at the time of the formation of the latter and its passing into Rockefeller's hands, but it was dropped by the company as of little value. Explorations up to that time did not reveal good ore.

IRON—VERMILION RANGE.

(From Our Special Correspondent.)

PIONEER IRON COMPANY.—This company has begun shipments, sending its first cargoes to dock late last week. There is no more talk of the sale, so freely predicted by local papers all winter, and which this *Journal* at the time denied.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The sales of zinc ore were only 37,770 lbs. less than last week, and the sales of lead ores were 79,230 lbs. less than last week. The top price paid for zinc ore was \$21 per ton, with an average of \$18. The output of zinc ore was less than last week, as several large concentrating plants shut down on account of the cut in the price of ore. The price paid for lead ore was \$16.25 per 1,000 lbs. with 50c. added for haulage. The different camps turned in as follows: Joplin zinc, 1,262,500 lbs.; lead, 222,250 lbs.; value \$16,118; Webb City, zinc, 840,410 lbs.; lead, 29,670 lbs.; value \$8,051; Cartersville, zinc, 1,009,210 lbs.; lead, 200,070 lbs.; value, \$12,390; Galena, Kan., zinc, 2,210,000 lbs.; lead, 361,000 lbs.; value, \$25,606; Stott City zinc, 40,500 lbs.; value \$405; Oronogo zinc, 17,310 lbs.; value, \$247. Totals for the district: Zinc, 5,379,930 lbs.; lead, 802,990 lbs.; value \$62,877.

GILBREATH & Co.—On the Edgar land Gilbreath & Co. have just opened up a fine lead and jack prospect at 160 ft. in open ground and will make a large turn-in this coming week.

MASTIN LAND.—Thomas Mastin owns 40 acres east of the Scotia, and has put down a shaft in which he struck a large body of zinc ore at a depth of 60 ft. in soft ground. He is drifting at 75 ft. on a 15-ft. face of pebble jack, and will make a large turn-in this week.

SADLER LEAD AND ZINC COMPANY.—This company is composed of Pennsylvania capitalists who own in fee simple 220 acres of land located one mile southeast of Duenweg, of which only 40 acres have been prospected. They have two shafts down, one at a depth of 131 ft., with a good face of lead, and the other at the 140-ft. line, with a 7 x 12-ft. face of zinc ore in timbering ground. They have made three good turn-ins. They are also prospecting this 40 acres with a steam drill, and have struck ore in every hole below a 140 ft.

SANSON-ZEIDTLER MINING COMPANY.—This company has leased 40 acres of the McConey land, situated on Turkey Creek, near Sargeant lead smelter. The tract has been surveyed into mining lots 200 ft. square. The pump shaft is down to 80 ft. and the water is hoisted with a steam pump. They are drifting on 15 ft. face of rosin jack in the open ground.

SASSAFRAS COMPANY.—This company has put down a drill hole on the Letral land, one and a half miles south of Joplin. At a depth of 45 ft. the miners struck a body of ore, and at once began sinking a shaft.

SCOTIA.—Col. H. H. Grigg has lately opened up two large producing mines on his own land southwest of Joplin. At the Scotia mine he is drifting at 70 ft. on a 22 x 60 ft. face of rich rosin zinc ore in soft ground, with a good cap rock. He handles his dirt on a screen or sluice and 6 hand gigs, 3 roughers and 3 cleaners, producing over 10 tons of high grade zinc ore each shift. He employs only 16 men at this mine. Last week he sold two carloads of zinc ore at \$23 per ton and 178 tons of rough ore which had accumulated in less than three weeks' time. He is also operating the Conley mine, in which he is drifting at 70 ft. on a 14-ft. face of free zinc ore in timbering ground. This mine is producing from 15 to 20 tons of high-grade zinc ore each week.

SHERICK & ARMILL.—W. C. Hinkson and James Butler, of Galena, Kan., are developing a 160-acre lease of the Sherick & Armill land, one and a half miles south of Grand Falls, and have a shaft down to a depth of 18 ft. on a fissure vein of lead and zinc, which they struck at a depth of 6 ft.

MONTANA.

GRANITE COUNTY.

BLOOMINGTON.—A deal has been consummated between the Scherr Brothers, of Deer Lodge, and Messrs. Saddler & Saddler and Christian Schar, of Chicago, by which this mine becomes the property of the Chicago syndicate. The new company will at once erect a 10-stamp mill on the property.

JEFFERSON COUNTY.

EVA MAY.—This mill, which had been shut down for six weeks on account of bad roads, has been started up again to its full capacity and about 75 men are now at work in the mine. It is reported that the management of the Eva May properties has practically passed to Captain John Sheehan as general manager.

FREE COINAGE.—Another strike has been made in this property. A chute of ore about 8-in. wide was struck in the east drift run from the 300-ft. level. A barren spot had been encountered in this drift, but after penetrating this for about 20 ft. it opened out into the chute. Ore has also been struck in the crosscut run from the 350-ft. level.

GOLD DUST.—J. A. Houston, president of the Houston Mining and Milling Company, operating this mine, received returns from the smelter recently of two tons of ore shipped from the Gold Dust as a test of the value of the ore. The returns as given were \$56 per ton; 15% copper and 20 oz. silver.

HIGH ORE MINING COMPANY.—This company in High Ore gulch is still working on its tunnel, which is in about 500 ft., and the face of it is in stringers of good ore.

HOMESTAKE.—Crosscutting from the bottom of the 100-ft. shaft on this property was begun recently. About 12 ft. from the shaft the lead was struck, and a chute of ore about 2 ft. wide was cut.

MERRILL MINING COMPANY.—It is reported that this company will this spring put in a plant capable of working 400 tons of ore daily.

THURSDAY.—Geo. B. Hopkins, one of the owners of this property, an extension of the Haldemac on the east, will put a steam hoist on the mine, which is now 100 ft. deep, and sink the shaft another 100 ft. Levels will soon be run from the bottom of the shaft to determine the value of the property. Several assays were made of the vein matter while the shaft was being sunk that gave good results.

LEWIS & CLARKE COUNTY.

OVERLAND.—A recent strike in this mine, three miles south of East Helena, made by Frank Esler at the 300-ft. level uncovered a large body of free milling gold ore. The vein has been crosscut 19 ft. without striking the hanging wall. The entire vein is free milling. The strike is on the mineral belt in which are located the Whitlach Union and Bonanza Chief.

MISSOULA COUNTY.

WHITE CLOUD.—The work of building the mill at this mine is advancing rapidly and the mill will probably be in operation by July 1st. The mine is being put in shape for working and will be ready to furnish ore for the mill as soon as the latter is ready.

SILVER BOW COUNTY.

BUTTE TUNNEL.—The work of tunneling under Butte, which has been progressing since last fall, has been suspended temporarily. The company utilized the Destroying Angel shaft, which was sunk years ago to the depth of 200 ft. at the southern edge of the city. From the bottom of this shaft the company cut directly north, following under Main street. It has traversed about one-third of the distance under the city, and has encountered several ledges containing a fair grade of mineral, but no ledge of the richness hoped for.

NEVADA.

STOREY COUNTY—COMSTOCK LODGE.

HALE & NORCROSS MINING COMPANY.—The Supreme Court of California decided on May 8th that the judgment against the directors of the Hale & Norcross Mining Company for \$210,000, with interest amounting to \$40,000, need not be paid until the final determination of the case. Some months ago the court affirmed the judgment of the lower court in the suit of Fox against the Hale & Norcross Mining Company on a portion of the issues, and found that the method by which the ore of the company had been milled had deprived the stockholders of \$210,000. The court also found that Judge Hebbard had erred in some of his calculations and sent the case back to be tried upon other issues. Judge Hebbard ordered the judgment for \$210,000 to be entered up as soon as the remittitur was received, and set the case for trial upon the remaining issues. In doing so, he followed what he supposed to be the instructions of the Supreme Court, which were to "enter judgment against H. M. Levy and Alvinza Hayward, as of the date of the former judgment."

The attorneys for the defense contended that the judgment should not be entered up until the final determination of the case, because there could not be two judgments in one case. They appealed from Judge Hebbard's order entering the judgment, and it was this order that has now been reversed. "That the judgment as entered is final," said the Court, "in form and character as to the issues involved therein no question is made. Nor is it controverted that the general rule in this State, as elsewhere, is that there can be but one final judgment in an ordinary civil action or proceeding. The court has no power to review its own final judgments, and we cannot now inquire whether our judgment on the final appeal was or was not warranted by law. The only question that we can consider on this appeal is whether the judgment now appealed from was entered in accordance with the mandate of this court." Continuing, the Court stated in substance that in construing its original judgment in the case the fair presumption was that no direction to enter a final judgment on some of the issues in advance of the trial on the remaining issues was intended. It should further have been assumed by Judge Hebbard that the judgment for \$210,000 should be part of the final judgment on part of the issues in the case. They did not so instruct him, but they now declare that nothing less than explicit language to the contrary would justify any other interpretation. The opinion was written by Justice Van Fleet and concurred in by McFarland, Henshaw, Temple and Beatty. Justices Garoutte and Harrison dissented. Since the appeal in this case was taken the trial upon the other issues has taken place in Judge Hebbard's court, and he has been withholding his opinion until the determination of the question as to whether he erred in entering up the judgment. The effect of the decision is merely to delay the payment of the money until the final judgment is rendered.

JUSTICE MINING COMPANY.—At the annual meeting of this company, held in San Francisco, Cal., on May 4th, 45,150 shares of the stock outside of the company's treasury were represented, and the following directors were elected: A. Waterman, H. Zadig, E. P. Barrett, P. Amersax and S. Jacobs. A. Waterman was chosen president, H. Zadig vice-president, R. E. Kelly secretary and R. P. Keating superintendent.

Following are extracts from the latest weekly official letters of the mine superintendents:

CONSOLIDATED CALIFORNIA & VIRGINIA.—In the 1,750 level, from the fourteenth to the twentieth floors at the north end of the stopes, in old ground of former workings, and from the northwest drift upraise on the east side of the ledge, we have extracted during the week 150 tons of ore, the average assay value of which, per samples taken from the cars in the mine, was \$63.21 per ton. In working to the southwest from the above mentioned upraise on the ninth, tenth and eleventh floors (above the sill floor), we have followed a streak of ore 2 ft. wide, assaying from \$20 to \$25 per ton. We shipped to the Morgan mill 285 tons and 1,710 lbs. of ore, assaying, per railroad car samples, \$43.62 per ton. The average assay value per battery samples of all ore worked at that mill during the week (460 tons and 200 lbs.) was \$40.50 per ton. Bullion shipped to the office in San Francisco, assay value, \$15,446.

HALE & NORCROSS.—No change is reported in the condition of the stopes above the 975 level. We extracted from the various openings during the week 28 carloads of ore, assaying, per car samples, \$24.23 gold and 23.87 oz. of silver per ton. Shipped to Dazet mill during the week 61 tons and 1,400 lbs. of ore, being the final shipment of the accumulation in the bins on March 14th. Wagon samples assayed \$26.42 gold and 28.56 oz. silver per ton. Forwarded to San Francisco office April 27th, 75½ lbs. crude bullion, valued by assay at \$2,218.

OPHIR.—In the openings above the sill floor of the old Central tunnel workings of the Ophir mine, in the northwestern part of the mine, five continue to follow small streaks of ore, and extracted therefrom during the week 16 tons of ore assaying \$53.90 per ton.

STOREY COUNTY—BRUNSWICK LODGE.

BRUNSWICK EXPLORATION COMPANY.—The following official report of Superintendent Kevin, of this company, gives the particulars of the recent

strikes of ore on the 200-ft. level of shaft No. 1 and at other points in the Brunswick lode: Shaft No. 1—This shaft has been sunk 11 ft. on the incline, passing through porphyry and quartz; total depth 425 ft., 200 level—The north drift started from the station (Hale & Norcross) has been advanced to a total length of 167 ft.; face in porphyry and quartz which assays about \$16 per ton. The south drift, which was started from the end of east crosscut No. 1, has been extended to a total length of 188 ft. At a point 6 ft. from the face ore was encountered showing a width of 2½ ft. and assaying \$75 a ton. The face now shows 3 ft. of ore of an average value of \$53.75, gold predominating. Shaft No. 2—The north drift, started at a point in west crosscut No. 1 25 ft. from the south drift, was extended 20 ft., passing through porphyry; total length, 29 ft. Gould & Curry Company's tunnel—The main north drift has been extended to a total length of 732 ft.; face in porphyry. At a point in this drift 700 ft. from the mouth we ran a west crosscut for a distance of 12 ft. to the foot wall, cutting through a body of quartz 2½ ft. wide, of an assay value of \$6 per ton.

OCCIDENTAL.—In the west crosscut No. 1 from north drift has been extended to a total length of 407 ft. The crosscut has reached the footwall of the vein at a point 50 ft. north of the ore body found on the 650 level, and we have started to drift south along the footwall in fair grade ore. We are also drifting north along the hanging wall in the ore first encountered by the crosscut.

WHITE PINE COUNTY.

STAR & GRAY EAGLE.—These two old mines are to be started again in the near future. Hon. A. C. Cleveland, William Bliss, of Carson City, and J. H. Bews are now estimating the cost of putting them in working order. When these mines are well opened there will be about 100 miners put to work.

NEW MEXICO.

TAOS COUNTY.

(From Our Special Correspondent.)

COLORADO TUNNEL.—This tunnel is now being worked by two shifts. Only one small vein of little importance has yet been struck, but some of the best known veins in the district are on the line of the tunnel.

COMANCHE PLACER.—Baumert & Fitch have made and are now putting in 200 ft. of sluice boxes on this placer. A large amount of prospecting was done last summer and the fact demonstrated that there is considerable pay gravel. The only difficulty is the flatness of the gulch in which it lies, which has been overcome by long trenches which reach to lower ground in the gulch below.

MEMPHIS.—This property, recently located by C. C. Cotton, has been a surprise to its owners. Several good assays have been made from the rock; the last and best test made by J. H. Moreland, of Idaho Springs, Colo., was as follows: Gold, 4.40 oz., silver, 27 oz.; total value, \$245. This sample was from a small streak presumably black sulphurets, the first found in the district.

SNOWSTORM.—A 100-ft. shaft with a 34-ft. crosscut to the vein has just been completed and some good ore has been encountered in the vein. A tunnel will be started on the vein in the bottom of the gulch this week and run in under the shaft. The hill being very steep, it will gain depth almost foot for foot. The ore is a sulphide and has improved with depth.

OKLAHOMA.

PHENIX OIL COMPANY.—This company, with a capital of \$3,000,000, has been organized to operate one million acres of oil territory in the Osage Indian Reservation in Oklahoma. The officers and directors are as follows: President, Albert T. Fancher, Buffalo, N. Y.; vice-president, N. G. Read, Boston, Mass.; secretary, Edwin B. Foster, New York City; treasurer, J. B. Foster, Westley, R. I.; general manager, James S. Glenn, Buffalo, N. Y.; directors: J. B. Foster, E. B. Foster, Albert T. Fancher, James S. Glenn, N. G. Read, Major E. C. Gordon and C. E. Darlington. The territory is leased on a royalty from the Osage Nation. It is reported that it was secured in competition with the Standard Oil interest. The lease has been approved by the Secretary of the Interior. The company takes over a number of producing wells. The tract adjoins the oil fields of Wilson, Neosha and Chauquaqua counties, Kansas, in which the Forest Oil Company, a branch of the Standard, is operating a hundred wells. On the same belt the Troy, Empire State, Geiser Oil and Sun Oil companies and Linerman Brothers are operating holdings ranging from 10 to 50,000 acres each.

OREGON.

BAKER COUNTY.

LIVERNE MINING COMPANY.—The Ohio mine is owned by this company, of Liverne, Minn., which is about to be incorporated under the laws of Oregon. It joins the Columbia mine, owned by the Cable Brothers, on the west side, and makes a good showing for the length of time it has been developed. A working tunnel, 7 ft. high and 5 ft. wide, is being driven and has now reached a depth of 325 ft.

PENNSYLVANIA.

ANTHRACITE COAL.

COXE BROTHER & COMPANY VS. LEHIGH VALLEY RAILROAD COMPANY.—Judge Acheson filed an opinion in the United States Circuit Court at Philadelphia, on May 11th, deciding in favor of the

Lehigh Valley Railroad Company in the proceedings instituted against the road by the Interstate Commerce Commission. The action was an outcome of the suit of the Coxe Brothers & Co., anthracite coal miners and shippers of Drifton, against the railroad for alleged discrimination in freight rates. Simon Stern, of New York, represented the Interstate Commerce Commission, and John G. Johnson, of Philadelphia, was the attorney for the railroad. On October 19th, 1888, Coxe Brothers & Co. filed a complaint with the Interstate Commerce Commission against the Lehigh Valley Railroad. The proceeding resulted in a finding by the Commission that the rates and charges, established by the defendant, and then in force over its line, for the transportation from the Lehigh anthracite coal region in Pennsylvania to Perth Amboy, N. J., were unreasonable and unjust. On March 13th 1891, the Commission made an order directing that the charges should not be over a certain rate per ton. The railroad company filed an answer denying that the rates were unreasonable or unjust and declaring the finding of the Commission was against the evidence. The case then came before the court. Judge Acheson, after reviewing the circumstances of the litigation, said: "The railroad company's report for 1887, upon which the Commission based its estimate, does not furnish the data by which the actual cost of carrying coal from the Lehigh and Mahanoy mines to Perth Amboy can be ascertained. The Commission, therefore, resorted to an estimate of the carrying cost. That estimate, however, as we have seen, rests upon an erroneous principle and is unreliable. Hence the order based thereon cannot be sustained, and is not to be judicially enforced." After quoting decisions of the United States Supreme Court in interstate commerce cases, Judge Acheson concluded: "These views of the Supreme Court decidedly show that the Interstate Commerce Commission is not clothed with the power to fix rates which it undertook to exercise in this case. The petition of the Interstate Commerce Commission must be dismissed." The court ordered that a decree to this effect be drawn. The Lehigh Valley Railroad did not obey the order of the Interstate Commerce Commission in the case and the Commission applied to the United States Circuit Court for an injunction to restrain the railroad from violating the order and for a decree compelling its enforcement. The opinion of Judge Acheson was upon this application.

DELAWARE & HUDSON CANAL COMPANY.—At the annual meeting of this company, held in New York on May 12th, John Jacob Astor was elected a manager in the place of John A. Stewart, who declined a re-election. No other changes were made. The report of the year's operations, the figures from which have already been printed, was approved. The managers met for organization on the 13th and re-elected all of the old officers. Mr. R. M. Olyphant's election means his twelfth consecutive term as president. There is now in the sinking fund maintained to pay off the loan of the city of Albany to the Albany & Susquehanna Railroad Company about \$150,000. The Delaware & Hudson Canal Company will therefore advance about \$100,000 to make up the amount maturing in November and about \$250,000 for the payment of the bonds maturing in May, 1897, a total of about \$350,000. The Delaware & Hudson is now paying \$70,000 a year on account of these bonds, that is, 6% interest on the loan and 1% into the sinking fund. After the loan is paid off this sum will go toward repaying the advances of the Delaware & Hudson Canal Company, and when that is accomplished, say in about five years from May, 1897, will be applicable for an increase in the dividends on Albany & Susquehanna stock.

HAZLETON STRIPPINGS.—The coal stripping operators near Hazleton are preparing to start up work. A. S. Vanwickle started up his Coleraine stripping, on May 6th, giving employment to 500 men. Contractors Dick & Co. have extended their plants so as to require several hundred men additional. The Lehigh & Wilkes-Barre Coal Company issued orders at all collieries about Hazleton to start up the stripping work by May 15th. This means employment for over 1,000 men.

STROUDSBURG COAL FIELDS.—Eight hundred acres of land believed to contain anthracite near Snydersville, have been leased by a number of Scranton capitalists. Prospectors are now at work on the ground.

BITUMINOUS COAL.

BELL, LEWIS & YATES COAL COMPANY.—This company has sold its plant to a syndicate composed of New York capitalists and some stockholders of the Buffalo, Rochester & Pittsburg Railroad. The syndicate is headed by the New York Guaranty Trust Company. Adrian Iselin & Co., of New York City, who headed the syndicate, have confirmed the report. The coal lands cover 12,000 acres in Jefferson and Clearfield counties, Pa. Of these four-fifths are held in fee simple, while the other fifth is controlled by a lease which is practically perpetual. The mines are said to have a capacity of 10,000 tons daily. Besides the mines there are 100 coke ovens. The four company stores, owned by Bell & Lewis, are also included in the deal, and several hundred miners' houses as well. Thirty miles of railroad also pass to the possession of the Rochester & Pittsburg Coal & Iron Company. The roads are the Reynoldsville & Falls Creek and a branch called the Falls Creek. These lines connect

with the Buffalo, Rochester & Pittsburg, the Erie, the Alleghany Valley and the Ridgeway & Clearfield. With the roads go the engines, cars and all the equipment. Possession of the property will be given to the new owners on May 15th. The purchase price could not be learned exactly.

SOUTH DAKOTA.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

EDGEMONT SMELTER.—Current report has it that the erection of a large smelter at Edgemont is now practically assured. The capital will be furnished by the Pennsylvania syndicate controlling Edgemont townsite and the irrigation and manufacturing projects now on foot at this junction point of the Montana and Black Hills divisions of the Chicago, Burlington & Quincy Railway. W. A. Farish, of Denver, mining engineer, has for a month past been engaged in a careful examination of the refractory gold deposits of both Lawrence and Pennington counties with a view of determining the probable volume of smelting ores.

GOLDEN SLIPPER.—This property with a record of having paid all expense of development from the surface, with a surplus of from \$10,000 to \$15,000 in ores still standing in the workings, is about to resume operations. A difference of opinion as to the mode of working among the owners led to a practical suspension in development since December 1st last.

KEYSTONE DISTRICT.—Another free gold find of the Holy Terror order is reported from the Keystone district. It was made by Messrs. Snowie, J. Phinney and Graham, prospectors in that district, upon an abandoned fractional claim lying west of Buckeye Gulch and near the Cross mine. The ground was formerly owned by a prospector named Ainley, who allowed his location to lapse. Snowie made the discovery last fall, but "covered" his find until the claim was open to relocation. The ledge is about 12 in. wide and the quartz, similar to that of the Holy Terror but richer, carries heavy shot gold and nuggets worth from 50 to 75c. imbedded in the ore.

SUNNYSIDE.—The hoisting works, pump and ore bins upon this property are now completed, and sinking will be resumed at once. The Crow Peak mill has been purchased and will be set up at the mine.

TEA BOND.—Many erroneous reports relative to the cause of the failure of the bond upon this property have appeared in the Chicago and Omaha papers. As a matter of fact the deal included the Tea and Dolcode claims, and some 10 other locations upon which practically no development had been done. The Tea yielded from a prospecting shaft quantities of very rich specimen ore, and sustained a mill test of 25 tons which gave returns of some \$8 per ton free gold. A working shaft 100 ft. in depth was sunk at some distance from the ledge and another ledge of very low grade quartz was encountered in this shaft, but no drifting was done and work was suspended before a pay chute was encountered. Samples from this shaft of course gave very low returns, and Mr. Clarence King's report was unfavorable. The returns from the 75-ft. shaft upon the Dolcode were so good, however, that the Chicago gentlemen for whom the examination was made, while refusing to take the entire property at the bonding price, asked for an 8 months' bond upon the Dolcode. As the owners have taken out ore averaging \$25 from grass roots, they refused to give a long-time bond and the deal failed.

Work has been resumed at the Dolcode. A hoist and pump have been put in, and much of the ore recently taken out has been sacked. The ledge varies from 20 in. to 3 ft.; is well defined and carries a gouge which frequently yields nuggets large enough for scarfpins.

TENNESSEE.

CAMPBELL COUNTY.

An agreement between the miners and operators of the Jellico district has been reached. At a meeting held in Jellico last week a scale the same as last year was agreed to. It will be referred to the local assembly by the miners for ratification. A final meeting will be held shortly to draw up contracts if ratified by the miners.

UTAH.

SUMMIT COUNTY.

CONSTELLATION SILVER MINING COMPANY.—The annual meeting of the stockholders of this company was held in Park City, May 5th. The following is the new board of directors: W. H. Wert, W. C. Lyman, Dr. E. P. LeCompte, Henry Sutton, E. T. Palmer, E. L. Lyman, C. H. Valentine. The officers are: President, W. C. Lyman, Salt Lake; vice-president and manager, W. H. Wert; secretary and treasurer and superintendent, Henry Sutton. This company owns 13 claims about a half mile southeast of the Ontario mill. The developments are a shaft 250 ft. deep, well timbered. The shaft will be sunk 500 ft. before drifting for the ore body will begin. To keep the treasury replenished an assessment of one cent was levied.

JUAB COUNTY.

LOWER MAMMOTH.—This property has already shown up some good ore in the upper workings, and a tunnel is being driven to the lower levels and is now in a distance of 310 ft.

SHOEBRIDGE BONANZA.—A company is being formed in Salt Lake City for the development of this

mine, near Silver City. The old Shoebridge mine is located between the Sunshine and the old Showers, the last named mine being the property of the Walker Bros.

UTAH COUNTY.

MALVERN GROUP.—The last installment of the \$100,000 paid for the Malvern group, in the Camp Floyd district, was paid recently and a company has been organized to work the property. The capital is \$1,500,000, divided into 600,000 shares. Following are the officers and directors: President, John Dern; vice-president, W. A. Sherman; treasurer, G. W. E. Dorsey; secretary, C. H. Jacobs; E. H. Airis and Frank H. Officer. This group consists of 10 claims, adjoining the Sunshine on the south, and contains the extension of the Sunshine vein.

WASHINGTON.

KITTITAS COUNTY.

BLUETT GOLD MINING COMPANY.—This company, in Peshastin district, started 30 stamps working on \$13 gold ore recently, and will run two shifts night and day continuously until November.

SNOHOMISH COUNTY.

CLEVELAND.—The Portland syndicate which has secured a bond on the Cleveland is making preparations to get ore from that copper property, and the owners of the New York, which is on the same lead, are making like preparations at that property.

RED BIRD.—At this property, near Granite Falls, the owners have stripped the lead above the track, and have found several stringers about one foot wide and running \$20 per ton.

WYOMING.

ALBANY COUNTY.

(From Our Special Correspondent.)

ALBANY PLACERS.—Reports just brought in from the Albany and Spring Creek placer companies are to the effect that they will commence hydraulic mining on May 9th.

POLE MOUNTAIN.—There is at present great excitement over some rich copper finds around Pole Mountain, some 13 miles southeast of this place. The vein is a true fissure between granite walls and at a depth of 10 ft. the pay streak is 18 in. wide. Several assays made by Denver assayers on an average of the pay streak give from 21 to 45% copper and from \$2 to \$42 gold. The ore body passes across the summit of the mountain and has been located for a distance of four miles. A town site was located this week and the prospects are favorable.

CARBON COUNTY.

(From Our Special Correspondent.)

CARBON COUNTY MINING AND MILLING COMPANY.—The president of this company has gone east to purchase a smelting plant for the reduction of the company's ores at Cooper Hill.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 15.

Statement of shipments of anthracite coal (approximate) in tons of 2,240 lbs., for the week ending May 9th, 1896, compared with the corresponding period last year.

	1896.		1895.
	Week.	Year.	
Pennsylvania Railroad.....	50,798	1,229,724	1,394,212

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending May 9th, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	
Shipped East and North:			
Allegheny, Pa.....	38,968	874,256	692,335
Barclay, Pa.....	685	18,987	
Beech Creek, Pa.....	46,972	1,146,922	1,103,900
Broad Top, Pa.....	5,759	184,688	196,361
Clearfield, Pa.....	69,362	1,751,551	1,711,448
Cumberland, Md.....	174,687	1,150,967	1,150,237
Kanawha, W. Va.....	123,958	1,554,520	1,243,009
Phila. & Erie.....	549	23,050	25,795
Pocahontas Flat Top.....			
Totals.....	300,940	6,704,944	6,123,085

† Week ending May 2d.

	1896.		1895.
	Week.	Year.	
Shipped West:			
Monongahela, Pa.....	26,144	357,580	319,056
Pittsburg, Pa.....	29,302	705,865	811,949
Westmoreland, Pa.....	50,850	753,907	876,014
Totals.....	106,596	1,817,442	2,007,019
Grand totals.....	467,536	1,840,492	2,132,814

Production of coke on line of Pennsylvania Railroad for the week ending May 9th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 83,731 tons; year, 1,663,368; to corresponding date in 1895, 2,049,455 tons.

Anthracite.

The anthracite market, as it is to be expected, continues exceedingly quiet. While sellers are as a unit in the decision to maintain the circular, very little new business is doing. The chief movement of coal just now is confined to deliveries on orders placed at last month's prices. Deliveries on these will continue for, say, six weeks longer, and will be sufficient to meet the current requirements of buyers.

The Western trade is also quiet, but is quite satisfactory in point of steadiness.

It is not to be expected that there should be much activity at this time. The tone of the market is remarkably well maintained, and statistically, the

trade is in much better condition than last year. The companies are keeping down their output within safe bounds. For the first quarter of this year anthracite shipments amounted to 9,446,093 tons, a decrease of 637,799 tons as compared with the corresponding period of 1895. The output for April, 1896, has not yet been figured out, but it will not differ much from the March output, which was 2,998,254 tons. The various companies are desirous of keeping up the present rate of restriction and if they should follow it through May and June, it will mean shipments of less than 19,000,000 tons for the first half 1896, thus giving pretty steady employment to miners during the second six months and minimizing the danger of the low prices of the past two years.

Bituminous.

The wholesale soft coal trade is very quiet. Both consumers and producers are still adhering to the "waiting policy" of the past few weeks, though some of the smaller contracts are now reported to be in the market.

Present deliveries are mostly for the trade around Cape Cod, while New York is taking but a small amount of coal to fill its wants and the Sound is showing little or no activity. Many of the producing companies, while they feel they are losing good time, have decided to await for the consumers' wants to force them to any action. The chief aim of the coal companies at the present time is to keep their agents from naming alongside prices; consequently the agents are taking the risk of the freights themselves, which is against the contract between the companies. It is thought that most of the selling agents are being kept in check in this respect, and the trade working along on an f. o. b. basis.

It is stated that the full details of the one or two contracts made with the New York, New Haven & Hartford Railroad are in the hands of the executive committee, and that a satisfactory action has been taken upon the matter. We understand that the bituminous association is holding its own and that it has straightened out many of the annoyances which have come to its notice. It is generally considered that should the "association" control the trade for the next month as it is doing now, business will be coming its way. We hear of one or two small contracts which have been bid upon at the combination figures.

All-rail trade is quiet, and the combination prices are being held. South American business has dropped off on account of the lack of vessels for this sort of trade and owing to the high freight rates of the few vessels which are willing to take it.

Transportation from mines to tide is slow, though this is not felt to any extent, in consequence of the inactive state of business. There are no blockades or side-tracking of coal and shipments at the various ports are being made promptly with the exception of one point. Cars are in sufficient supply for the demand, and generally speaking, there is no trouble from this quarter. The points off the mainline which are usually embargoed during active seasons are still open for present shipments, and will remain so until business is better.

In the coastwise vessel market there is a scarcity of vessels brought about by fogs and adverse winds, but as soon as these conditions disappear there will be a sufficient quantity of light vessels for all wants. Norfolk is still reported with a large amount of light vessels waiting for tonnage. Such a state of things is due to the contracts which were to have stopped running May 1st, and on which the contractors put in vessels before the date of the closing of these agreements.

We quote current rates of freight from Philadelphia: To Boston, Salem and Portland, 65c.; Providence, New Bedford and the Sound, 60c.; Wareham, 80c.; Lynn, 75c.; Newburyport, 75c.; Portsmouth, 65c.; Dover, \$1.10 and towage; Saco, 90c. and towage; Bangor, 65c.; Norfolk and Newport News, 5c. @ 10c. above these rates.

Buffalo, N. Y.

May 14.

(From Our Special Correspondent.)

There are no changes to note in the supply, demand or prices of anthracite coal. Business is very dull. Bituminous coal is quiet, and quotations may be made a shade firmer, but no changes have been made in the published lists. Manufacturers are busy with orders, but complain that collections are very slow.

Coal freighting has not opened very lively. Vessel men think rates are too low, so send their vessels light or else to Ohio ports for soft coal. The shipments of coal westward, from May 4th to 10th both days inclusive, were 64,500 net tons, distributed thus: 27,950 tons to Chicago; 15,650 tons to Milwaukee; 8,450 tons to Duluth; 8,900 tons to Superior; 600 tons to Ashland, and 1,210 tons to Toledo. The rates of freight were 50c. to Manitowoc, 45c. to Racine and Kenosha, 40c. to Chicago and Milwaukee, and 35c. to Duluth, Superior, Ashland and Toledo. Closing with vessel owners generally asking 50c. to Lake Michigan and 30c. to Lake Superior ports.

From opening of navigation to April 30th, this year 82,664 tons of coal passed west and through the American Sault Ste. Marie Canal.

Chicago.

May 13.

There is but slight change in the condition of the Chicago anthracite coal trade, the buying, if anything, being just a trifle better than last week. There is a slightly improved appearance in the market, and the small increase of orders during the week may possibly mean a better market right

along. Prices are \$5@5.25, and have more of a tendency to strength than has been observed for some time past.

The bituminous coal trade remains in about the same condition, buying still continuing in a slow way indeed. The Chicago & Great Western Railroad will put into effect on May 12th a proportional rate on soft coal and coke from Chicago to St. Paul and Minneapolis, as follows: Soft coal, minimum weight 15 tons, \$1.80 a ton of 2,000 lbs.; coke, minimum weight 12 tons, \$2.20 a ton.

Pittsburg.

May 14.

(From Our Special Correspondent.)

Coal.—Trade since our last has not been very active; the lower ports are well supplied. The new mines are generally running full; the late rise enabled the coal men to bring home a large supply of empties, sufficient to give the miners employment for some time. The situation of the railroad coal trade has experienced little change since our last report, although stocks in the Northwest are said to be very light. But little coal has been purchased so far by the lake shippers, their demand being fully supplied by their own mines.

In the Westmoreland coalfields a new railroad extension will open up many more acres. The Belt developed 600 acres of rich coal lying between Herminie and Cowansburg. Work has already begun on the extension of the Hempfield Railroad. The new extension will connect with the White Coal Company, will proceed with the Youghiogheny Railroad, and the terminus will be less than two miles from the Baltimore & Ohio. The extension will be completed within two months.

The new Butler & Pittsburg Railroad is said to be interested in a syndicate of Pittsburg and Eastern capitalists, which has secured an option in about 12,000 acres of coal lands near Verona, and has just completed a series of drill tests, which show an abundance of good coal awaiting to be opened up. The Turtle Creek route, talked up for the new road, would cut through these lands. In case some other way into Braddock is chosen by the Carnegie road, a branch will be run into this field.

The Bell, Lewis & Yates deal, a very important one, is referred to elsewhere.

Connellsville Coke.—Production fell off about 600 tons and shipments declined 37 cars, compared with the previous week. The slight decline is attributed to hesitancy on the part of furnacemen and a disposition to go slow until the market shows a stronger demand. The several attempts to shake off the dullness that has ruled the coke trade all year have not been successful. Operators are not without hope that the near future will make the better trade a permanent reality and base their hope on the movement in iron and steel. In the running order of 11,651 ovens in blast, 4,598 ovens made six days, 6,983 ovens five days, 70 ovens four days, an average of 529 days, as against 550 the preceding week. No ovens are likely to be blown out, but the running order of the plants may be reduced. The production for the week in tons, estimated upon the ovens drawn, amounted to 111,447 tons. The shipments were distributed as follows: To Pittsburg and river points, 2,106 cars; to points west of Pittsburg, 3,676 cars; to points east of Pittsburg, 1,630 cars; total, 6,812 cars. The price of furnace coke is nominally \$2, at the ovens; the middlemen as well as some furnaces are selling below that figure.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 15, 1896.

Fig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '95.		From Jan., '96.	
	May 17, 1895.	May 15, 1896.	F'ces.	Tons.	F'ces.	Tons.
Anthracite.....	35	20,876	42	21,910	413,526	582,418
Coke.....	121	130,794	138	172,480	2,721,452	3,312,839
Charcoal.....	19	4,250	15	5,230	85,218	101,300
Totals.....	175	155,920	195	199,620	3,220,196	3,996,557

The iron market continues unmistakably dull. Buying of raw materials is confined to immediate wants, which are apparently small, except in structural material. In that department a good demand is reported. The tonic which the steel combine physicians prescribed has not worked so far, but fresh doses are to be administered by the doctors of minor importance, such as the Bar Iron Association, the bolt combine and others. The patient is so reduced that he does not even protest against these doses.

Meantime stocks of raw material are accumulating, and the furnace reports show a total stock of 769,500 tons on May 1st, as compared with 525,000 tons on January 1st. The chief increase has been in anthracite pig, stocks of coke by showing little change.

The Merchant Bar Iron Association held a meeting this week in Cincinnati. The meeting was private, but it is announced that another one will be held next week, and that an advance in prices, which has been promised for some time, will then be decided on.

The demand for iron will be a little more active owing to the large orders for freight cars. These include contracts for 2,500 coal and box cars for the Philadelphia & Reading and 5,000 for the Baltimore & Ohio, besides some smaller contracts. Most of these contracts were taken by Western shops.

Some large orders for locomotives have also been placed, and the railroad trade is increasing in every direction but steel rails. Some good bridge bids are noted including one for 23 bridges over the new depressed line into Boston, which the New York, New Haven & Hartford is building.

The latest combination is that of the bolt and nut makers. Their second meeting was held in Boston this week, when it is stated that the combination was completed, all the makers consenting, and agreeing not to sell below the pool prices. An immediate increase of some 50% in prices is promised. The market is again to be stimulated by high prices—with the probable result of stopping sales altogether for the time.

An Indianapolis despatch reports that the Premier Steel Works in that city, which were built four years ago by the Depauws at a cost of \$500,000, and which have been in the hands of a receiver since May, 1893, lying idle, have just been leased to a syndicate composed of the American Tin Plate Works of Elwood and the American Wire Nail Company of Anderson. Within 60 days the new combination will begin the manufacture of steel billets, steel beams and structural iron. The capacity for steel billets alone is 100,000 tons annually. This is a direct move against the steel combination, and may be followed by others. It may be noted also that many manufacturers are making inquiries as to the cost of basic steel plants.

NOTES OF THE WEEK.

The new steel steamer *Coratia* made her first voyage recently, taking 4,301 tons of iron ore from Escanaba to Ashtabula. This is claimed to be the heaviest cargo ever taken on the lakes, and the owners of the vessel claim that she could have taken 1,500 tons more, had there been more water in the Detroit River.

The Association of Sheet Iron and Steel Manufacturers met in Pittsburg on Wednesday and decided that any increase in wages was not possible at the present time. The bi-monthly meeting to adjust the wages of puddlers under the bar iron agreement was also held this week in Youngstown, but no change was made.

The wage committee of the Amalgamated Association has been appointed and meets to-day to consider the scale for the coming year. It is believed that an increase will be asked for. The system now in vogue of making bi-monthly adjustments will likely be abolished, as it has not proved satisfactory. The puddlers participating are opposed to the plan, and will send representatives to the convention instructed to vote and work for a straight annual scale, the plan that had previously been in force since the organization was formed.

New York. May 15.

The local market is still very quiet in every direction, except in structural material. Generally there is little selling, and the run of small orders from the shops is light. A number of the Newark shops have been laying off men. Down East there is a little better report as to work, but a good deal of grumbling about slow collections. In the City shops work is not pressing.

New building plans continue to be filed, and there is negotiation going for a good deal of material. The latest big building is that of the Ivins Syndicate, for which room is being made by tearing down half a dozen buildings on Park Row. This is to be one of the biggest in the city, about 120 ft. front and 26 stories high above the sidewalk, besides three below.

Pig Iron.—Not much business is reported. None of the foundries are especially busy, except the pipe makers, and they are generally stocked for the season. From Alabama some adjustment of prices in the lower grades is reported, and the scale now stands, f. o. b., at furnace: Foundry, No. 1, \$8.25; No. 2, \$7.75; No. 3, \$7.25; No. 4, \$6.90. Soft, No. 1, \$7.75; No. 2, \$7.25. Forge, gray or mottled, \$6.75. This does not mean that a good order, with cash, will not bring the iron for a shade less. In the local market the same remark would apply if there were any big orders. Meantime we cannot report any material change in prices.

We quote for Northern iron as follows: No. 1 foundry, \$12.75@13.25; No. 2 foundry, \$12@12.50; gray forge, \$11.25@11.75. For Southern irons we quote: No. 1 foundry, \$11.75@12.25; No. 2 foundry, \$11.25@11.75; No. 1 soft, \$11.25@11.75; No. 2 soft, \$11@11.50; forge, \$10@10.50. All prices are for tide-water delivery.

Cast Iron Pipe.—No large transactions are noted, but some small contracts are under discussion.

Spiegeleisen and Ferro-Manganese.—Only a few sales are noted, and quotations are unchanged at \$19.50@20.50 for imported spiegeleisen and \$47@47.50 for ferro.

Steel Billets and Rods.—No sales are reported at the pool price, which is \$21.75 per ton for New York delivery. Rods are quoted nominally \$27@27.50, with only a few small sales.

Merchant Iron and Steel.—Business is not active and there is no rush to buy, in spite of the prospect of an advance in bars. We quote for common bars, 1 1/2@1 3/4; refined bars, 1 1/2@1 3/4; soft steel bars, 1 1/2@1 3/4; Other quotations are: Steel hoops, 1 1/2@1 3/4; steel axles, e.65@1.80c.; links and pins, 1 1/2@1 3/4; tire steel, 1 1/2@2c.; spring steel, 2 1/2@2 3/4c. Open hearth machinery steel is 1 1/2@1 3/4c.

Plates.—Demand is a less active and prices are unchanged. We quote for universal mill plates, 1 1/4@1 1/2. Other quotations are: Tank, 1 1/4@1 1/2; boiler shell, 1 1/2@1 3/4; good flange, 1 1/2@1 3/4; fire-box, 2 1/2@2 3/4. Charcoal iron plates are 2 1/2c. for shell, 2 1/2c. for flange, and 3 1/2c. for firebox. Rivets are 3@3 1/2c. for best iron and 2 1/2@2 1/2c. for steel.

Structural Iron and Steel.—Business continues good and there is talk of some big contracts, as noted above. Beams are a little higher; other prices unchanged. We quote for angles, 1 1/2@1 3/4; channels, 1 1/2@1 3/4; tees, 1 1/2@1 3/4; beams (up to 15-in.), 1 1/2@1 3/4; for large lots and 2@2 1/2c. for small orders.

Steel Rails and Rail Fastenings.—Last week's sport has subsided and no new orders were noted. The street rail orders under negotiation depend largely upon financial arrangements, which are still unsettled. Steel rails are quoted at \$23.75 per ton at tidewater for standard sections; girder rails at \$29@32 at tidewater.

Rail fastenings are quiet. Fish and angle-plates, 1 1/2@1 3/4; spikes, 1 1/2@1 3/4; bolts, 1 1/2@2 1/2c. for square nuts, and 2 1/2@2 1/2c. for hexagon nuts. Prices for bolts are provisional, pending the orders of the new combine.

Scrap Iron.—The demand for casting scrap is light, but prices are steady, and there is not much good scrap offering. We quote \$10.50@12 per ton for good machinery scrap; \$9.50@10.50 for ordinary foundry, and \$6.50@7.50 for stove-plate and mixed.

Buffalo, N. Y. May 13.

(Special Report of Rogers, Brown & Co.)

The most noticeable features to report from this district this week are that consumption has unquestionably dropped off and although some few concerns report plenty of work, yet the majority are running light. All are inclined to be hopeful for the future. Sales are few and far between. Both Northern and Southern furnaces are firm at present prices and not a few state that as soon as they work up last year's ore purchases they will be compelled to do one of three things: Obtain higher prices for their product; run at a loss; or go out of blast. Local furnaces are busy now that the Erie Canal has opened. This has reduced stocks and there is but little, if any, pig iron on hand at the furnaces in this vicinity. We quote on cash basis f. o. b. cars Buffalo as follows: No. 1 foundry, strong coke iron, Lake Superior ore, \$13.50; No. 2 foundry, strong coke iron, Lake Superior ore, \$13; Ohio strong softener No. 1, \$13.50@14; Ohio strong softener No. 2, \$13@13.50; Jackson County silvery No. 1, \$15.25@15.50; Southern soft No. 1, \$12.40; Southern soft No. 2, \$11.90; Hanging Rock charcoal, \$18; Lake Superior charcoal, \$14@14.50.

Chicago. May 13.

(From Our Special Correspondent.)

In no one branch of the iron trade has there been any activity, nor has there been any increased business in any line over the preceding week. There is much of a disposition on the part of consumers to stop out of the market as long as is possible, and buy only for temporary wants. In structural material the market was never more quiet, and in steel rails, rods and billets there is but little doing. Reported contracts for cars have not apparently helped the bar trade.

Pig Iron.—Sales of pig iron ran from carload to 100 ton lots during the week and there were but few of those. A couple of thousand tons would be a good aggregate of both Northern and Southern iron sold during the week. Prices are fairly held in Northern iron with Southern quite weak. Lake Superior charcoal iron has been more active than any other brand, and there is a tendency to increase price in that iron somewhat. We quote: Lake Superior charcoal, \$13.50@14; local coke foundry No. 1, \$12.25@12.50; local coke foundry No. 2, \$11.75@12; local coke foundry No. 3, \$11@11.50; Southern coke, No. 1, \$12.10@12.35; Southern coke, No. 2, \$11.60@11.85; Southern coke, No. 3, \$11.10@11.60; Southern, No. 1, soft \$11.60@11.85; Southern No. 2, soft, \$11.35@11.60; Jackson County silveries, \$14.50@16; Ohio strong softeners, \$15@15.50; Alabama car-wheel, \$16.85@17.35.

Structural Material.—There is but little business. Prices are as follows: Beams and channels, 1 1/2@1 3/4; angles, 1 1/2@1 3/4; plates, 1 1/2@1 3/4; tees, 1 1/2@1 3/4. Small lots from stock are quoted 1/4c. to 1/2c. higher.

Bar Iron.—General trade is dull and inquiry light. Quotations are for common iron 1 3/4@1 3/4; for refined 1 3/4@1 4/8.

Steel Rails.—There has been a few sales of rails during the past week, aggregating not more than a thousand tons. Quotations are \$29 and upward.

Billets and Rods.—But little business has been transacted. Billets are quoted \$21.25 and rods \$29.50@30.50.

Old Rails and Wheels.—A few small sales of old iron rails have been made at about \$14.50. Old wheels are quiet and quoted at \$13.50.

Cleveland, O. May 11.

(From Our Special Correspondent.)

Iron Ore.—The week has been quiet in the ore market. A few sales are reported each day, but they are of a minor character. Usually at this season of the year the expected output is pretty well sold up. It is estimated that only from 3,000,000 to

3,500,000 tons of 1896 ore has yet been disposed of. This includes the ore which furnacemen, who have mines, are getting out for themselves. The actual sales would be considerably less than that amount.

For the little ore that is now being sold the special demand is still for the very low phosphorus ores. The mines that produce these fancy grades are few and the output is limited. Several of the companies could have sold their entire output, but while making generous concessions to the early purchasers, declined to let all of their product thus go. The Illinois Steel Company's purchases were largely of this variety, and what little the Carnegie interest has purchased has been of the same grade. The specifications in orders for steel rails and other finished product for a considerably lower percentage of phosphorus than usual has created the active demand for the highest priced ores. The standard mines are not selling much ore yet.

Unless the sales of ore increase the lake freights which have heretofore been strong will soon begin to sag. They are already showing that tendency on Lake Michigan, while 70c. is still the nominal mill rate from Escanaba, shippers are offering only 65c. to-day and will be able to secure tonnage at that figure unless conditions change. Late last week the Marquette wild rate advanced from 85c. to 90c. and is now quiet at that quotation. From Duluth the rate is steady at \$1. Little has been done this week in season charters.

Non-Bessemer ores are quiet and prices are steady at \$2.75 for standard hematites. No change has occurred in the prices for the Bessemer products.

Pig Iron.—The market lacks special feature. The sales that are being made are for small amounts, even the price lacks character, though the nominal quotation is still \$13.25, Cleveland, for Bessemer pig. Northern Strong is quoted \$12.50@13 for No. 1, and \$12@12.50 for No. 2.

Philadelphia. May 15.

(From Our Special Correspondent.)

Pig Iron.—The market is dull all through. Neither brokers nor furnacemen have any explanation to give concerning its strange collapse just when better things were expected. Prices are not notably lower, though it is understood large contracts could be closed on more reasonable terms. Special brands keep well sold up, but the abundant offerings all week of other brands keep prices in buyers' favor. People are awaiting some change. No. 1 iron is quoted at \$13; No. 2 at \$12.25; forge at \$11, with shadings for some few brands.

Steel Billets.—Until speculative holdings disappear there will be no change. The quoted price is \$21. Consumers are waiting to see what will happen to the combination.

Merchant Bars.—The iron trade has not improved. Less business was given out than was expected. Car builders seem to get along without iron. Inquirers are scarce, and concessions can be had on large orders. Refined, \$1.20.

Nails.—Business is slow. Buyers consider that nails are high and that makers will find it a wise thing before many weeks to meet buyers' views. The consumption is heavy.

Skelp.—There are no new developments in the market. Parties representing buyers do not care to consider any of the offers that have been made during the past few days.

Sheet.—The mill men say there has been no important business this week. Prices are kept at the lowest possible point in order to encourage buyers. Manufacturers are bidding on two or three large orders this week.

Merchant Steel.—Season contracts are of fair size, and there is more disposition to close, as good arguments are used to show that prices may harden. All kinds of merchant steel are meeting with fair sale, but the concessions made this week show the talk of stronger prices has no substantial foundation.

Pipes and Tubes.—Some fresh encouragement was developed to-day in an inquiry or two for a large lot of wrought-iron pipe work. The requirements for cast are certainly large and promising.

Plate.—Manufacturers are anxious to induce parties having the giving out of work to hurry up. We are told there is big work right within our grasp, and cases are mentioned of expected orders ranging from 50 to 200 tons. The Girard estate order for between 2,300 and 2,400 tons was taken at home. Three or four other local requirements will soon be placed for shapes and plates. In fact brokers who are trying to make big commissions on some big sales, say there has been no time within many months when there was as much work hanging fire.

Steel Rails.—A fair volume of business is being done in small orders for both standard sections and girders.

Old Rails.—Demand is unusually quiet.

Scrap.—The scrap dealers are accumulating all kinds of scrap, for which there is very little demand.

Pittsburg. May 14.

(From Our Special Correspondent.)

Raw Iron and Steel.—The business situation during the week has developed very little change. The principal feature of the iron market is its narrowness, a condition that is steadily becoming more aggravated. The question of prices does not seem to be involved to any great extent, but merely the

disposition of consumers to take material is at stake. There is little demand, and, apparently, no reasonable reduction in prices would induce buying, which, in most departments is limited to the current requirements of consumers, and the general hesitancy to abandon the conservative policy is largely attributable to a desire to test the strength of recently formed combinations for the maintenance of advanced prices. The contest between the middlemen and the manufacturers bids fair to be a long one. The great drawback to trade is the enormous production, which is largely in excess of wants at the present time. The Youngstown manufacturers of iron are still much perturbed about the policy the Bessemer billet pool contemplates. Acting on information within their possession as to what their policy will be, several open-hearth steel plants are projected to supply themselves with steel billets for bar and sheet purposes. Some parties predict that within a year the Mahoning Valley will be dotted with open-hearth furnaces. It looks as if consumers intended to make a big contest.

Latest.—The dullness previously noted continues. Bessemer ranges from \$12.57@ \$13, Pittsburgh grey forge, \$10.85@ \$11; steel billets, \$19.35@ \$19.90. Other articles show no special changes.

The following tables show the weekly prices of Bessemer pig for April during the past two years. They will be found useful for comparison:

1895.		1896.	
April 3	\$10.50@ \$10.75	April 3	\$13.35@ \$13.90
" 10	10.60@ 10.85	" 10	13.30@ 13.85
" 17	10.65@ 10.9	" 17	13.25@ 13.75
" 24	10.65@ 10.9	" 24	13.40@ 13.60
May 1	10.75@ 10.90	May 1	13.00@ 13.40

Below are given the weekly prices of steel billets for April during the past two years:

1895.		1896.	
April 3	\$15.45@ \$16.00	April 3	\$17.40@ \$20.00
" 10	15.70@ 15.90	" 10	19.85@ 20.25
" 17	15.75@ 15.85	" 17	19.50@ 20.00
" 24	15.6@ 16.00	" 24	15.40@ 20.25
May 1	15.5@ 15.80	May 1	19.35@ 20.25

COKE SMELTED, LAKE AND NATIVE ORE.	Tons.	Cash.
2,000 Bessemer, May, and June, Pitts.	1,000 Billets, May, at mill.	19.90
1,500 Bessemer, May, Pitts.	900 Billets, May, at mill.	19.90
1,000 Bessemer, May, Pitts.	500 Billets, May, at mill.	19.35
1,000 Bessemer, June, Pitts.	500 Billets, May, at mill.	19.59
1,000 Bessemer, May, Pitts.	500 Billets, May, at mill.	20.00
500 Gray Forge, May, Valley.	SKELP IRON.	
500 Mill iron, May, Pitts.	1,000 Wide grooved, Pitts.	\$1.25 4 m.
500 Gray Forge, May, Pitts.	600 Narrow grooved, Pitts.	1.25 4 m.
500 Bessemer, May, and June, Pitts.	400 Sheared, Pitts.	1.45 4 m.
500 Off Bessemer, Pitts.	SKELP STEEL.	
225 No. 2 Foundry, prompt, Pitts.	800 Sheared, Pitts.	\$1.35 4 m.
100 No. 1 Silvery, prompt, Pitts.	600 Wide grooved, Pitts.	1.15 4 m.
75 No. 2 Silvery, prompt, Pitts.	500 Narrow grooved, Pitts.	1.15 4 m.
50 No. 2 Foundry, prompt, Pitts.	MUCK BAR.	
	500 Neutral, Pitts.	\$20.50
	STEEL WIRE RODS.	
	800 5-gauge, delivered, Pitts.	\$27.50
	SHEET BARS.	
	900 Delivered, Pitts.	\$21.50
	FERRO-MANGANESE.	
	100 80 per cent. delivered, Pitts.	\$1.25
	SCRAP AND OLD RAILS.	
	500 Iron rails, Pitts.	\$16.50
	500 Steel rails, Pitts.	13.00
	300 Steel rails, Pitts.	13.85
	300 No 1 Wro't scrap net, Pitts.	13.00
	200 No 1 cast scrap, gross, Pitts.	10.50

Cartagena, Spain. May 1.

(Special Report of Barrington & Holt.)

We have to report at present considerable competition for the output of iron and manganese iron ores from the mines in this Sierra, as the demand for good ore exceeds the supply. Several contracts for both iron and manganese ores have been made for delivery over the balance of the year, while many inquiries have been refused, owing to the scarcity of ore. During the past month 13 cargoes of manganese and 8 cargoes of dry ore have been shipped from Cartagena.

We quote as follows, all prices being f. o. b. shipping port: Ordinary 50% Portman ore, 5s. 6d. @ 6s. per ton; special low phosphorus, 5s. 8d. @ 6s. 2d.; extra quality, 6s. 4d. @ 6s. 10d.; specular ore, 60% iron and under 0.03% phosphorus, 8s. 9d. For manganese ore we quote for No. 1, 20% iron and 20% manganese, 13s. 6d. per ton; No. 1, B., 25% iron and 17% manganese, 10s. 8d.; No. 2, 30% iron and 15% manganese, 10s. 3d.; No. 3, 35% iron and 13% manganese, 9s. 4d.

Exports of metals, other than iron ore and lead, from this port for the past month have included

2,105 tons zinc ore to Antwerp; 80 tons copper ore and 2½ tons tin ore to England; 75 tons iron pyrites, 60 tons lead ore and 7,963 kilos of silver to Marseilles. We quote for iron pyrites, 40% iron and 45% sulphur, 10s. 6d. per ton; for best quality yellow ochre, 40s.

METAL MARKET.

NEW YORK, Friday Evening, May 15, 1896.
Gold and Silver.

Prices of Silver per Ounce Troy.

May.	St. Ex.	London Pence.	N. Y. Cis.	Value of sil. in \$.	May.	St. Ex.	London Pence.	N. Y. Cis.	Value of sil. in \$.
9	4 88½	31	67½	525	13	4 88½	30½	67½	524
11	4 88½	31	67½	525	14	4 88½	31½	67½	525
12	4 88½	30½	67½	523	15	4 88½	31½	68	526

The refusal of the India Council, on Wednesday, to follow declining tendency of the exchanges was followed by a stiffening of the rates, and a large inquiry for silver followed, which culminated today at 31½d., with large sellers.

The United States Assay Office in New York reports the total receipts of silver at 69,000 oz. for the week.

Gold and Silver Exports and Imports.

At all United States ports, April, 1896, and years from January 1st, 1896 and 1895:

Specie and bullion.	Exports.		Imports.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
April	\$3,782,266	\$1,142,502	\$5,426	\$95,119	E. \$2,550,071
1896	16,916,572	23,747,264	80,319	453,022	I. 7,233,395
1895	33,514,726	19,033,291	310,912	432,354	E. 14,359,983
SILV.					
April	5,139,978	568,662	14,665	1,490,055	E. 3,695,926
1896	20,420,322	4,391,752	554,109	5,513,136	E. 11,039,543
1895	15,254,515	2,596,547		3,810,759	E. 8,847,209

These figures are furnished by the Bureau of Statistics of the Treasury Department and include the exports and imports at all United States ports.

Gold and Silver Exports and Imports, New York

For the week ending May 15th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$3,673,579	\$29,837	\$817,300	\$126,043	E. \$4,294,999
1896	21,971,216	16,851,490	14,269,923	80,742	E. 15,388,969
1895	32,331,454	18,407,238	11,938,683	586,511	E. 25,325,378
1894	35,578,111	7,813,268	15,691,573	594,911	E. 42,890,518
1893	56,788,696	5,682,464	11,561,934	1,117,724	E. 61,520,412
1892	23,548,893	6,068,361	9,284,719	546,136	E. 26,219,115

Of the gold exported for the week, \$3,350,000 went to Germany and \$83,579 to the West Indies; the silver went to London. The gold imported came from the West Indies; the silver from South America.

Average Monthly Price of Silver

in New York and London, per ounce Troy, from January 1st, 1896, and for corresponding months, 1895 and 1894.

Month.	1896.		1895.		1894.	
	Lon. Pence.	New York Cents.	Lon. Pence.	New York Cents.	Lon. Pence.	New York Cents.
January	30 69	67 13	27 36	59 69	30 81	66 63
February	31 01	67 67	27 47	59 90	29 18	63 43
March	31 34	68 40	28 33	61 98	27 22	59 49
April	31 10	67 92	30 39	66 61	28 95	62 92

FINANCIAL NOTES OF THE WEEK

As we indicated last week the export of gold has been considerable, the total during the week amounting to \$4,550,000, with the possibility of an addition to this figure before the steamers start on Saturday. This brings up the total since April 4th to nearly \$14,000,000.

There is no doubt a special demand for gold bullion from Russia in connection with some formulated scheme of reform of the monetary conditions in the country. Fortunately two large negotiations have taken place in London covering a value of more than \$8,000,000 by the sale of New York City and State of Massachusetts bonds, and at very satisfactory prices to the borrowers. This will be quite a considerable aid in the relief of the exchange market, but at the same time it is admitted by most bankers and the Treasury authorities that without such further substantial sales of securities abroad, the outflow of gold is bound to be both considerable and steady.

The trade returns for April and for the past 12 months are in themselves extremely satisfactory, especially in view of the doubt that now exists in the minds of many home and foreign traders as to what the financial policy of this country is going to be.

Naturally there is much discussion in business circles as to what line of policy the President for the next term will adopt with regard to the gold standard, and even in the comparatively short interval that will elapse between change of occupants of the presidential chair, it is now being discussed whether it will be necessary to issue more bonds on the part of the Government. So far as present appearances go, if any attempt is made to maintain the gold reserve at \$100,000,000 new bonds will have to be issued before the end of June, that is to say within 40 days.

There are many people in the West, fighting honestly for what they think, their own interests, and who wish to see a failure in the present administration of the Treasury, so far as it will serve to promote the free coinage of silver. We may expect deadlocks in the political conventions, and the same policy in the Senate and Congress afterwards in this direction, but as we must admit that at least some of the prominent members of each party are able men, it is almost impossible that such tactics will be carried out for any length of time.

A noticeable figure has disappeared from the financial, or perhaps more correctly described, the bi-metallic world, M. Henri Cernuschi. The amount of reading and careful study that he has brought to bear on the subject of bi-metallicism has, perhaps, never been equalled, but at the same time he had views which were controverted by many others who were also students of the subject.

The following statement, from the Bureau of Statistics, Treasury Department, shows the foreign merchandise trade of the United States for the month of April and the ten months of the fiscal year from July 1st April 30th:

	April		Ten Months	
	1895.	1896.	1895-96.	1895-96.
Exports	\$65,253,641	\$70,944,443	\$688,303,156	\$749,038,129
Imports	68,749,958	58,705,209	604,279,067	666,353,062
Excess	\$3,494,317	\$12,239,044	\$184,024,089	\$182,685,063
Net excess of exports, gold				54,509,738
Net excess of exports, silver				26,745,607

Total excess of exports \$161,027,808
Imports. † Exports.

The large decrease of imports in April of this year is to be noted.

Specie shipments from San Francisco in April included \$392,169 silver and \$4,508 gold to China, \$153,390 silver to Japan, \$50,190 gold and \$6,000 silver to Honolulu, \$380 gold to Mexico, \$1,102,785 gold and \$30,000 silver to New York, a total of \$1,929,422.

There was a further marked falling off in the shipments of Mexican dollars in April. The total for March was \$792,267, while for February there was over \$2,000,000 shipped. High price for the coin in this market and unsatisfactory condition of the Chinese exchanges this way are assigned as causes for the decrease in the movement. The amounts and descriptions of specie shipped from San Francisco in the first four months of the year compare as follows:

	1895.	1896.
Silver bars	\$3,390,300	\$1,711,440
Mexican dollars	1,309,890	3,270,980
Peru sols	3,968	12,890
Silver coin	245,542	41,500
Gold bars		42,481
Gold coin	3,631,484	8,558,243
Gold dust	250	280
Currency and bonds	232,495	759,413
Total	\$8,671,464	\$13,697,794

The destinations of the above shipments were as follows:

	1895.	1896.
Hongkong	\$2,475,869	\$1,658,577
Shanghai	1,871,300	2,138,850
Japan	27,374	1,276,790
Central America	268,298	1,000
Honolulu	90,060	87,900
Mexico	4,650	3,416
New York	3,790,973	8,531,811
Total	\$8,671,464	\$13,697,794

The large increase in shipments to Japan this year is to be noted.

The statement of the United States Treasury on Thursday, May 14th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

	May 7.	May 14.	Change.
Gold	\$121,590,755	\$116,154,105	D. \$5,436,650
Silver	23,946,554	25,226,812	I. 1,279,258
Legal tenders	79,014,373	81,887,097	I. 2,872,724
Treasury notes, etc.	31,757,967	32,342,122	I. 584,155
Totals	\$256,309,689	\$255,600,136	D. 709,553
Govt bank dep	25,777,312	23,708,107	D. 19,205

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$132,591,280. Against these are held in the Treasury 12,347,497 cent standard silver dollars, and the silver bullion purchased at a cost of \$120,243,783, making a total of \$132,591,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—of

the week ending May 9th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

Table with 3 columns: 1894, 1895, 1896. Rows include Loans and discounts, Deposits, Circulation, Specie, Legal tenders, Total reserve, Legal requirement, Surplus reserve.

Changes for the week this year were increases of \$3,393,200 in loans; \$11,400 in deposits, and \$136,900 in specie; decreases were \$19,900 in circulation; \$2,835,900 in legal tenders, and \$2,701,150 in surplus reserve.

The following table shows the specie holdings of the leading banks of the world at the latest dates covered by their reports. The amounts are reduced to dollars, and comparison is made with the holdings at the corresponding dates last year:

Table with 4 columns: Bank Name, Gold, Silver, Total. Lists banks like Asso. Banks of New York, Bank of England, Bank of France, etc.

The return for the Associated Banks of New York is of date May 9th; all the others are of date May 14th, except the Bank of Italy, which is dated March 31st, and the Bank of Russia whose return is dated April 1st-13th.

Shipments of silver from London to the East for the year up to April 30th are reported by Messrs. Pixley & Abell's circular as below:

Table with 3 columns: 1895, 1896, Changes. Rows include India, China, The Straits, Totals.

Arrivals for the week this year were £96,000 in bar silver from New York, and £20,000 from the West Indies; a total of £116,000.

The demand for Indian exchange continues good and the 60 lakhs of Council bills offered in London were all taken at an average of 14 1/16d. per rupee.

Domestic and Foreign Coins.

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

Table with 3 columns: Bid, Asked. Rows include Mexican dollars, Peruvian soles, Victoria sovereigns, etc.

Other Metals.

Copper.—The market is exceedingly firm, and a very large business has been done. For lake copper there has been freely bid and paid, but most of the larger producers are now out of the market.

£49 5s. @ £49 10s.; best selected, £50 @ £50 5s.; strong sheets, £54 10s. @ £55; India sheets, £52 10s. @ £53 10s.; yellow metal, 4 1/2 d.

The following figures give the production (in tons of 2,240 lbs.) of copper in the United States, and also by the chief foreign mines, and the exports from the United States for April and the four months ending April 30th:

Table with 3 columns: March 1896, Four mos. 1895, 1896. Rows include Production fine copper, Reporting mines in U.S., Pyrites and outside sources U.S., Reporting foreign mines.

Total production, long tons... 23,977 80,230 96,327 Exports from U.S., fine copper. 10,684 19,463 38,040

The exports from the United States were nearly double those of last year.

Tin continues firm, with a good consumptive demand. We quote 13 1/2 @ 13 3/4 c. for spot and May, and 13 1/2 @ 13 3/4 c. for futures.

Foreign prices are slightly higher, the closing quotation being £59 17s. 6d. @ £60 for spot and £60 10s. @ £60 12s. 6d. for three months prompt.

Lead has eased off somewhat, but there is no actual pressure to sell. Nearby delivery is obtainable from 3.02 @ 3.05.

In London Spanish lead is quoted £11 @ £11 1s. 3d., and English lead 5s. higher with a good demand. St Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull, with buyers very scarce.

Spanish Lead Market.—Messrs. Barrington & Holt, of Cartagena, Spain, report as follows under date of May 1st: In sympathy with English prices local quotations for pig lead on wharf have been greatly falling and are to-day about one real lower than a month ago.

The average quotation for April was 56 3/4 reales per metric quintal of lead which, taking exchange on London at 29 3/8 pesetas per £1 is equivalent to £10 10s. 6d. per ton of 2,240 lbs. f.o.b., Cartagena; silver to be paid at the rate of 15 reales per oz. Quotations for lead ore are as follows: Potters ore, 8s. 9d. per cwt.; Linares ore, 6s. 9d. per cwt. for sulphide and 4s. 6d. for carbonate.

Spelter continues irregular, but prices are well maintained at about 4c.

From Europe higher prices are again reported, good ordinaries having advanced to £17, and specials to £17 3s. 9d.

Antimony remains dull with little doing.

Nickel.—Demand is moderate and prices are unchanged. We quote 35 1/2 @ 38c. per lb. for small orders, and 34 @ 35c. for ton lots. The London price is 13 1/2 @ 15d. per lb.

Platinum.—Prices are steady and unchanged and we quote \$13 @ \$14.50 per oz. New York. London quotations are 40 @ 51s. per oz.

For chemical ware, best hammered metal, Messrs. Elmer & Amend, New York, furnish the following quotation, the prices given being respectively for orders of over 250 grams; for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 48c., 49c., and 50c. per gram. Wire and foil are 45c., 46c., and 47c. per gram. The current retail price for crucibles is 60c. per gram.

Quicksilver.—Quotations continue at \$37.50 per flask, New York. The London price is £6 15s. per flask; with £4 13s. 9d. @ £6 14s. quoted from second hands.

The receipts of quicksilver at San Francisco for April and for the first four months of the year compare as follows:

Table with 3 columns: April, Four months. Rows include 1894, 1895, 1896.

Exports by sea from this port in April were 462 flasks, including 345 to Mexico and 115 to Central America. Exports in the same way for the first four months of the year were as follows: New York, 2,500 flasks; Hongkong, 3,000; Mexico, 1,388; Central America, 460; New Zealand, 10; British Columbia, 3; total, 7,361 flasks, against 5,259 flasks for the corresponding period in 1895, and 7,987 flasks in 1894.

The Minor Metals.—Quotations for these metals are given in the table below, the prices being for New York delivery:

Table with 3 columns: April, Four months. Rows include Aluminum, Bismuth, Phosphorus, Platinum, Tungsten, etc.

The variations in price are chiefly on size of order.

Average Monthly Prices of Metals

In New York since January 1st, 1896, and for the corresponding periods in 1895, 1894, 1893 and 1892, in cents per pound.

Table with 6 columns: Month, 1896, 1895, 1894, 1893, 1892. Rows include Copper, Tin, Lead, Spelter.

Imports and Exports of Metals.

Table with 4 columns: New York, Week, May 7, Year, 1896. Rows include Aluminum, Antimony ore, Brass, Copper, Iron ore, Lead ore, Magnolia metal, Nickel, Steel, Tin, Zinc.

* Metal Exchange Reports. † Week ending May 14.

Table with 4 columns: Baltimore, Week, May 7, Year, 1896. Rows include Bismuth metal, Chrome ore, Copper, Iron ore, Lead, Limestone, Manganese ore, Spiegeleisen, Steel, Tin, Zinc.

** From our special correspondent. † Week ending May 14.

Table with 3 columns: Philadelphia, Week, May 9, Year, 1896. Rows include Antimony, Copper, Ferro-Manganese, Ferro Silicon, Iron ore, Manganese ore, Spiegeleisen, Tin, Tin and black plates.

†† From our special correspondent.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, May 15.

Heavy Chemicals.—There has been an improved feeling in this market lately. Caustic soda is only in light demand, but prices are somewhat firmer. Alkali and carbonated soda ash have been in better inquiry and several sales for future delivery are reported. The same applies to salt cake. Sal soda continues quiet. Bleaching powder is without

marked change, business being light at regular prices. We quote: Caustic soda, 2 1/2% @ 2 1/2 c. for spot, according to test carbonated soda ash, 45%, is 95 @ 120 c., according to quantities and packages. Alkali is 77 1/2 @ 87 1/2 c., according to test and package. Bleaching powder, prime brands, 1 1/2 % @ 1 1/4 %.

Acids.—This market has continued quiet. The trade now doing consists chiefly of the usual deliveries on existing contracts. Prices are without change of consequence and we quote as follows: per 100 lbs. in New York and vicinity, in lots of 50 carboys or over: Acetic acids (in barrels), \$1.25 @ \$1.40. Muriatic acid 18", 70 @ 80 c.; 20", 75 @ 85 c. Nitric acid, 36", \$5.25 @ \$4.25; 40", \$4 @ \$4.50; 42", \$4.50 @ \$5.50. Oxalic acid, \$7.25 @ \$7.50. Mixed acids, according to mixture. Sulphuric acid, 60", 75 @ 80 c.; 10 @ 15 c. higher for small quantities; chamber acid, \$6.00 @ \$6.50 per ton at factory. Blue vitriol, \$3.87 1/2 @ \$4, according to size of order.

Brimstone.—The market continues dull. We quote for shipments, best unmixed seconds, \$16; thirds are 50 c. less.

Fertilizing Chemicals.—The fertilizer market continues quite and featureless. Considering the slack demand prices have ruled quite steady, and we quote: Sulphate of ammonia, gas liquor, \$2.30; bone, \$2.25 @ \$2.30. Dried blood, high grade, \$1.75 @ \$1.80; low grade, \$1.60 @ \$1.65 per unit. Azotine, \$1.50. Concentrated phosphate (30% available phosphoric acid), 70 @ 71 1/2 c. per unit. Acid phosphate, 13% to 15%, av. P₂O₅, \$4 @ 55 c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 90 @ 92 c. per unit. Acidulated fish scrap, \$10 @ \$11 and dried scrap with few or no sales, nominally \$18 @ \$19 f. o. b. fish factory. Tankage, high grade, \$18.50 @ \$19.50; low grade, \$18 @ \$19. Bone tankage, \$21; ground bone, \$22.50 @ \$23.00. Bone meal, \$22 @ \$23.

Sulphate of Potash: 90-95%, New York and Boston, \$1.90 1/2; Philadelphia, Baltimore and Norfolk, \$1.98; Southern ports, \$2.

Double Manure Salts: 48-53%, New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03 1/2.

Muriate of Potash.—New prices for muriate are New York and Boston, 1.78 c.; Philadelphia, Baltimore and Norfolk, 1.79 1/2 c.; New Orleans, 1.81 1/2 c., for 80 @ 85% (basis of 80%), in lots 50 tons and upward.

Kainit.—Quotations for 1806 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.80 per ton; Norfolk, \$9.15, and New Orleans, \$9.30 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 30 1/2 c., 37 1/2 c. and 38 c., respectively.

Nitrate of Soda.—Spot, \$1.70 @ \$1.75; to arrive, \$1.75.

Liverpool. May 6.

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

Dullness is still the prevailing feature in the chemical market.

Soda ash is in moderate demand. Quotations vary according to export market, and the nearest spot range for tierces is about as follows: Leblanc ash, 48%, \$4 @ \$4 5/8; 58%, \$4 5/8 @ \$4 10/8. Ammonia ash, 48%, \$3 25 @ \$3 10/8; 58%, \$3 7/8 @ \$3 12/8. 6d. per ton, net cash; bags 5s. per ton less. Soda crystals are inactive at \$2 7/8. 9d. per ton, less 5% for barrels and 7s. less for bags.

Caustic soda is in limited request. The nearest spot range, according to market, is about: 60%, \$6 5/8 @ \$6 10/8; 70%, \$7 5/8 @ \$7 10/8; 74%, \$8 5/8 @ \$8 10/8; 76%, \$9 @ \$9 5/8 per ton, net cash.

Bleaching powder is slow of sale and hardwood is nominally quoted at \$7 25 @ \$7 5/8 per ton, net cash. Chlorate of potash is idle and is quoted at 4 1/4 @ 4 1/2 d. per pound. Bicarb. soda is moving off at \$6 15s. per ton less 2 1/4 % for the finest quality in one cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is quiet but steady at \$8 5/8 @ \$8 7/8. 6d. per ton, less 2 1/2 % for good gray and 2 1/4 % for 25% in double bags, f. o. b. here, according to quality. Nitrate of soda does not show much business, but values are steady on spot at \$8 5/8 @ \$8 7/8. 6d. per ton, less 2 1/2 % for double bags, f. o. b. here, according to quality. Carb. ammonia, lump, 3 1/4 d. per pound, powdered, 3 1/4 d. per pound, less 2 1/2 %.

MINING STOCKS.

Complete quotations will be found on pages 486 and 487 of mining stocks listed and dealt in at:

New York. Aspen, Colo. St. Louis.
Boston. Colorado Springs. Paris, France.
Philadelphia. Duluth, Minn. Mexico.
Baltimore. Helena, Mont. Shanghai, China.
Pittsburg. Salt Lake, Utah. Valparaiso, Chile.
Denver, Colo. San Francisco. London, England.
Chicago and Cleveland, page 484.

NEW YORK, Friday Evening, May 15.

Interest in the mining stock market during the past week has attached chiefly to the developments in the Brunswick lode, which has had a favorable effect on the price of some of the Comstocks. The San Francisco market has been more active than for months past, but the New York public does not seem to take much interest in mining stocks.

Of the Comstocks Chollar had sales of 700 shares at \$2.10 @ 2.85; Consolidated California & Virginia an equal number of shares at \$2.75 @ \$3.25; Mexican, 1,000 shares at 95c. @ \$1.30. The majority of the other Comstocks also show advances in price,

though toward the close the San Francisco market began to show symptoms of weakening.

The California stocks have been quiet without any especial feature of interest.

The Colorado shares show the usual trading.

Boston. May 11.

(From Our Special Correspondent.)

The market for copper stocks in the early part of the week was dull and prices had a declining tendency but the advance in ingot copper the past day or two has stimulated speculation, and to-day the prices, under the lead of Boston & Montana, improved with an advance all through the list. Boston & Montana sold in early dealings at \$75.50, to-day it touched \$80 and closed only a fraction under. Butte & Boston advanced from \$2.25 to \$3 with a better demand for it than for a long time. Calumet & Hecla continues firm at \$300 to \$303 on very small dealings. Quincy was weak and sold quite freely at \$110 to-day. However, it sympathized with the rest of the list and advanced to \$115. The scrip sold at \$79 to \$81.25. Tamarack was the weakest stock on the list and early declined from \$90 to \$84, but later it recovered and sold to-day at \$90 again. Osceola, after selling at \$24.25, took an upward turn and sold up to \$27.50 to-day.

Kearsarge, also, felt the improved tone to the market and advanced from \$9 1/2 to \$12 1/2, with an active demand. Franklin sold in small lots at \$11 1/2 and \$11. Atlantic was fairly firm at \$17. Tamarack, Jr., declined from \$12 1/2 to \$9, but recovered later to the former figure. Wolverine advanced from \$6 1/2 to \$7 1/2, and Arnold sold at \$1. Old Dominion copper advanced from \$15 to \$18 to-day and closed firm at \$17 1/2.

The gold stocks have been very active this week, under the lead of Merced, which declined on heavy dealings to \$8, with later recovery to \$12 1/2, followed by further decline to \$9, closing weak. Pioneer was raided by the bears, who succeeded in breaking it to \$7 1/2. It quickly rallied and to-day sold up to \$8 1/2 and closed strong. Santa Ysabel is very quiet; only 100 shares sold this week at \$12.

Gold Coins declined from 65c. to 50c., one sale of 10,000 shares made at the lowest price; the last sale to-day was at 52 1/2 c. The market closed strong for the copper stocks, and fairly firm for the gold mines.

Chicago. May 13.

(From our Special Correspondent.)

The business for the week has been remarkably light, but slightly in excess of the previous one. The unusual heat at this early season of the year has not been conducive to activity and has driven several of the most active brokers to the country. It is not likely that any marked recovery from the present dullness will take place until after the two great political conventions have been held. Prices have held their own and in some cases have scored fractional advances. Cosmopolitan jumped up 20% on the closing day of the week in consequence of the telegraphic reports from the property and closed firm at the advance.

Finance has been practically out of the market, only 3,000 shares having been sold, and closing weak.

Imperial guaranteed advanced 1 1/4. A good many inquiries concerning the guarantee features of this stock are coming in from outside points. The guarantee of the company as announced in last week's report is to pay a monthly dividend of not less than 1% commencing with the present month. The May dividend will be payable June 10th, and regularly thereafter dividends are promised on the 10th of each succeeding month.

The Medina has made a rich strike at the bottom of their shaft on the Little Darling claim, now down 98 ft. of a narrow streak of high-grade ore assaying 26 oz. gold, or \$520 per ton.

Little Gem, Peerless and Sumpter have all been in fair demand with few fluctuations in prices.

The brokers have presented a petition to the trustees asking them to follow the example of other mining exchanges in holding but a single daily call during the heated term. This matter is now under consideration, and it is probable that commencing next week the afternoon call will be discontinued for a few weeks.

The following table gives the highest prices with sales of the stocks recorded on the Chicago Mineral and Mining Board for the week ending May 13th:

Stocks.	May 7	May 8	May 9	May 11	May 12	May 13	Sales.
Alchemist	.07 1/2	.08	.07 1/2	.....	.09	.10	54,600
Boston & C. C.	.....	.....	.....	.....	.....	.....	.....
Capazone	.....	.....	.03 1/2	.03 1/2	.....	.....	2,500
C. C. & C. C.	.....	.....	.....	.07 1/2	.07 1/2	.07 1/2	7,500
C. C., G. M. B. & L. Co.	.10 1/2	.11	.....	.....	.....	.....	200
Chl. & G. Mt.	.....	.....	.....	.....	.....	.....	.....
Cosmopolitan	.05 1/2	.05 1/2	.05 1/2	.24 1/2	.24 1/2	.06	100,500
Delaware Cr.	.24 1/2	.....	.....	.....	.....	.....	5,000
Finance	.....	.....	.....	.....	.....	.....	3,000
Hawkeye	.31 1/2	.....	.....	.....	.31	.04	2,000
Imperial	.....	.15	.....	.....	.....	.15	200
" Pfd.	.21	.....	.21 1/2	.21 1/2	.21 1/2	.21 1/2	13,500
Little Gem	.04 1/2	.04 1/2	.....	.04	.04	.04 1/2	39,000
Medina G. M. Co.	.07	.....	.06 1/2	.07	.07 1/2	.07 1/2	18,000
Peerless G. M. Co.	.11 1/2	.11 1/2	.....	.11 1/2	.11 1/2	.11 1/2	28,500
Rhyolite	.....	.....	.....	.10	.....	.....	8,000
Sunnyside	.....	.....	.....	.....	.....	.....	.....
Gilpin	.....	.....	.....	.10 1/2	.08	.....	3,200
Total shares sold, 286,300.							

Cleveland, O. May 14.

(From Our Special Correspondent.)

There is still a divergence of opinion between buyers and sellers of iron ore stocks, and the market in consequence shows little life. There are buyers who would pick up stocks which they thought were cheap, but owners are holding for what they believe the property is intrinsically worth. Bids of \$18 for Republic this week do not bring out their certificates, and \$20 is asked. There are several blocks of Lake Superior in the markets, but their bids of \$30 fail to produce a transaction. Quotations follow:

Name of Company.	Par val.	May 14.	
		Bid.	Ask.
Aurora	\$25	.....	88
Chandler	25	\$38	40
Cleveland-Cliffs Iron Co.	100	43	45
Jackson Iron Co.	25	70	75
Lake Superior Iron Co.	25	30	32
Lake Superior Consolidated	100	20	21
Minnesota Iron Co.	100	70	71
Pittsburg & Lake Angeline	25	80	85
Republic Iron Co.	25	18	20

Colorado Springs, Colo. May 9.

(From Our Special Correspondent.)

The mining stock market has continued to exhibit the features which have characterized it these past two months. The lower-priced stocks have been in little or no demand, and quotations consequently display no upward tendency. The better class of stocks are also quiet but rule fairly steady, considering how dull the market is. The activity in both mining and building operations at Cripple Creek has been such as to encourage our brokers in the belief that a reaction for the better will be experienced before many weeks. I am informed that inquiries from the East have been more numerous than for some time past.

The Colorado Springs Mining Stock Association will be in their new exchange in a few weeks, perhaps by June 1st. This is another evidence of the prosperity which has attended this well managed institution.

Messrs. Gardner & Co. furnish the closing quotations of the Colorado Springs Mining Stock Exchange for the week ending May 7th, as follows:

Name of Company.	May 8	May 9	May 11	May 12	May 13	May 14
	Alamo	.05 1/2	.05 1/2	.05 1/2	.05 1/2	.05 1/2
Anaconda	.63	.63 1/2	.63	.63	.61	.63
Arsentum-Juniata	.54	.54 1/2	.55	.55 1/2	.55	.54
Blue Bell	.06	.06	.06	.06	.06	.06
Cripple Creek Con.	.13 1/2	.14	.14	.14 1/2	.14	.14 1/2
Golden Kleece	1.70	1.67	1.62	1.71	1.71	1.71
Isabella	.58 1/2	.54 1/2	.55	.57	.57	.58
Mollie Gibson	.61	.60	.60 1/2	.61	.61	.61
Mount Rose	.59 1/2	.59 1/2	.59 1/2	.59	.59 1/2	.59 1/2
Pharmacist	.07 1/2	.07 1/2	.08	.07 1/2	.08	.07 1/2
Portland	1.52	1.60	1.55	1.61	1.8	1.70
Silver State	.01 1/2	.01 1/2	.01 1/2	.01 1/2	.01 1/2	.01 1/2
Union	.9	.89	.8 3/4	.90 1/2	.89 1/2	.9 1/2
Work	.10 1/2	.10 1/2	.11	.11	.11	.10 1/2

In addition to the above quotations Messrs. A. Pick & Co., of New York, furnish the following:

Name.	May 8	May 9	May 11	May 12	May 13	May 14
Bankers	.12 1/2	.12 1/2	.12 1/2	.....	.....	.....
Des Moines	.....	.....	.....	.....	.....	.....
Gold & Globe	.23	.22 1/2	.22	.....	.....	.....
Gold Standard	.09	.09	.09	.....	.....	.....
Isabella	.54 1/2	.55	.57 1/2	.....	.....	.....
Jefferson	.18	.18	.18	.....	.....	.....
Keystone	.....	.....	.....	.....	.....	.....

Salt Lake City, Utah. May 9.

(Special Report of James A. Pollock.)

There has probably been more investment money turned loose during the past week than for two or three months previously. Local investors turned their attention more generally to the cheaper and speculative stocks, with some few exceptions in favor of the more attractive of the investments. Outside orders were largely of the investment class, however.

Ajax remained practically unchanged, although toward the end of the week the inquiry became more marked and there was a consequent stiffening of quotations. Anchor has suspended operations for a short time in order to make some needed changes and repairs. The stock showed considerable life during the week. Alliance was inactive, as was also Natural Gas. Centennial Eureka was very strong, with very limited offerings of stock and none below \$80. Dalton & Lark will pay its usual dividend of 1/2 c. per share May 15th. Both the Dalys were very strong, this being especially the case with the Daly, which sold above \$8 toward the close of the week. Eagle is driving away with vigor again and the showing is reported to be very good. Despite good reports received from the Four Aces, the stock did not advance as was anticipated and toward the end of the week displayed material weakness as compared to prices of 10 days ago. Galena pays 5c. per share, or \$5,000 in dividends May 10th. This stock was strong, selling at advancing figures. Geyser did little business and is not likely to do much until its legal tilt with the Marion Company is ended. This struggle is about to commence in earnest. Horn Silver was in fair demand around \$2 and small blocks could have found takers at 15c. higher. Little Pittsburg was not as active

as usual. The properties are still covered with snow.

Ontario was strong, with little of the stock offered. Silver King paid its regular monthly dividend of 25c. per share May 7th. This stock showed great strength and there is little of it offered under \$20. Sioux Consolidated was inactive. Swansea did considerable business. Tetro was a favorite at advancing figures. Utah will pay 2c. per share in dividends May 10th. Utah Consolidated, a neighbor of the Sioux, is a new applicant.

San Francisco. May 9.
(From Our Special Correspondent.)

Speculation in the Comstocks has been stimulated this week by continued talk about the new discovery in the Chollar, and by the decision in the Hale & Norcross case. The market opened quite actively, and though there was some slackening off later, when the announcement was made that work in the Chollar would be suspended until new machinery could be put in, prices continued good and dealing was larger than for some time past. It is still an inside market, however, and the public is not coming in to any notable extent.

Some closing quotations are: Consolidated California & Virginia, \$2.20@2.25; Chollar, \$1.45@1.50; Ophir, \$1.50@1.60; Hale & Norcross, \$1.30@1.35; Occidental, \$1.20@1.25; Bodie Consolidated, 55c.; Bulwer, 30c.; Mono, 14c. It is something unusual to have five Comstocks above the dollar mark.

Mining assessments becoming delinquent in May amount to \$102,810, of which \$15,000 is for California and \$87,810 for Nevada mines.

The total sum disbursed by the mining, milling and other corporations on and around the Comstock for April was \$60,376, or \$1,000 more than the March disbursements. The amount paid by each company was as follows: Hale & Norcross, \$2,481; Hale & Norcross mill, \$416; Andes (estimated), \$1,200; Consolidated California & Virginia, \$9,958; Mexican, \$1,788; Ophir, \$2,340; Best & Belcher, \$1,472; Gould & Curry, \$1,117; Alta, \$1,323; Utah, \$433; Occidental, \$3,300; Brunswick Exploration Company, \$3,486; Savage, \$2,980; Crown Point, \$2,201; Yellow Jacket, \$1,354; Confidence, \$311; Challenge, \$119; Belcher, \$2,197; Segregated Belcher, \$642; Imperial, \$69; Bullion, \$976; Chollar, \$2,568; Potosi, \$2,678; Union Shaft, \$2,450; Sierra Nevada, \$706; Alpha and Exchequer, \$708; Nevada mill (estimated), \$2,500; Electric Light (estimated), \$500; Water Company (estimated), \$3,000; quartz mills (estimated), \$5,000.

THE NEW EXCHANGE.

Business on the Gold Mining Exchange continues good and there is quite a show of activity on the call board every day. The number of stocks dealt in is still quite limited, but will probably soon be increased. The number of shares sold is large, and there seems to be a good deal of outside interest in the buying, which is growing, as the Exchange and its methods are becoming better known and appreciated.

Some quotations noted are as follows: Amalie, \$185; Sebastopol, 53@56c.; Savannah, 38@41c.; Lockwood, 36@38c.; Grant, 24@25c. Several new companies, it is understood, are to be listed soon.

London. May 2.
(From Our Special Correspondent.)

The South African section of the mining market has been fluttered during the past week by the events at Pretoria, but they have had less effect on quotations than one would expect. The news from Bulawayo is much more encouraging than it has been since the Matabele rising commenced, and the fact that Earl Grey has arrived there without any opposition, would indicate that the rising is not such a formidable one as was at first supposed. In the stock market the chief efforts of the jobbers is to lower the price of Chartered. It is considered certain that there will have to be another issue of half a million shares, and that the issue will be made at the market price of the day. The jobbers would like to see the price of issue low, so as to leave them a greater margin of profit. On the other hand the directors and present shareholders desire the price of issue to be high and are doing their best to counteract the tactics of the jobbers. The quotation of the stock has varied slightly during the week, but is practically at the same level that it has been at for several weeks past, viz., about £3 5s. @ £3 10s.

The Transvaal stocks have not been very active during the week, but have been quite steady with a good tone.

The Indian section has been strong all week, the leading stock being Coromandel, an off-shoot of the Mysore Company. The result of the first crushings is expected shortly, and as there is every indication that the mine will have the same characteristics as its parent, there is a good market for the stock. New Zealand stocks have been active, but nothing of note has occurred. During the past few weeks there has been a great deal of steady buying of Broken Hill Proprietary and of British Broken Hills, chiefly on Australian account. The Colonials must have information which is not known in London, for there is no sulphide process of proved value known here, though the Burnham Syndicate process looks promising. The prospects of a revival in American mining to which I referred in last week's letter continue promising. It will be of interest to Americans to know that Mr. Gillson, of San Francisco, has been appointed assistant manager of the Exploration Company in London.

It may safely be said that of all American mining countries, British Columbia is occupying most attention in England. A great many small syndicates have been formed privately during the past 12

months, and by the end of the present summer, these syndicates will have acquired a good many interests in the Province. A company to work a property in British Columbia has been introduced to the public this week. This is the Big Valley Creek Gold Mines, Limited, with a capital of £125,000 to work a placer property occupying one square mile in Big Valley Creek and Two Bit Creek in the district of Cariboo. It is 12 miles from the Williams Creek mines, and the record of the latter is relied on in recommending the present property. It is proposed to start operations on the bed of the river in Big Valley Creek by constructing a dam and diverting the stream, and afterwards to commence hydraulic mining on each side of the stream. Very little is said in the prospectus of the tested value of the river bed and gravels, but it is assumed that there is 100,000,000 cu. yds. of gravel containing an average of 40c. to the yard. The purchase price of the property is £100,000, payable in 94,000 fully paid shares and £6,000 in cash. The vendor is Major Dupont, who is to be appointed resident managing director.

At the meeting of the New Guston Mining Company, Limited, the directors were not able to declare any dividend for 1895. The total output of ore was 14,833 tons, a larger amount than has ever been mined, but as the average sale value was only £2 4s. 1d. per ton there was no profit made. Most of the ore was treated by the Silverton Smelter, which is partly owned by the Guston Company, and other ores were sold to smelters at Pueblo and Durango. During the present summer very little mining will be done and the whole attention will be paid to development and prospecting in the hopes of discovering ores of greater richness. Mr. Harvey, who has been manager at the mine for several years, has resigned and is succeeded by Mr. Harold Wilson.

Paris. May 3.
(From Our Special Correspondent.)

The resignation of M. Bourgeois and the formation of a new moderate ministry have affected the market, upon the whole, less than might have been expected. The new ministry is not displeasing to the financial world, in spite of the fanatical protectionism of its head, M. Melinc. It remains to be seen whether it will have the courage to formulate and carry out a policy of its own, or whether compromises with the radical element will be thought necessary. At any rate, the conflict between the Senate and the Chamber, which threatened serious consequences, has been postponed for the present, and that is a gain. The ministerial crisis might have caused some disturbance had not the great bankers quietly joined in supporting the quotation of rates, and other stocks felt the effect of their steadiness.

The metallurgical stocks continue strong, as it is apparent that a good business and good prices are assured for the present season, and perhaps longer. The iron trade all over Europe, in fact, is in more promising condition than for several years past.

The speculation in the copper stocks has been active, and we begin to look for a reaction. Rio Tintos have been evidently pushed above their real value, and while the same thing can hardly be said of the others, a fall in Tintos would carry down the whole list.

The South African stocks continue very quiet, and the political uncertainty prevents either buying or selling. The course of President Kruger is generally approved here, and one does not know how to characterize strongly enough the course of the Chartered Company, and the manner in which a large part of our neighbors have approved its grasping and treachery. One almost regrets that the death sentences at Pretoria are not to be carried out, and that their number did not include the real leaders. The dangerous point at present is that there seems still to be a powerful clique in Johannesburg and London determined to promote bad feeling and war, if possible.

As to other stocks, your Rebecca is strong, and there has been quite a demand for it at good quotations. There is a growing interest in Russian mines, and I hear that two or three new gold mining companies are to be brought out here. There has been a good deal of buying of the Russian coal and iron shares which are dealt in here, of which Dombrowa, Donetz, Briansk and Huta-Bankowa are the principal ones. Of these shares, Briansk has been quoted this week at 1,300@1,350 fr.; Donetz, 780@800 fr., and Huta-Bankowa at 2,550 fr.

A coal discovery of some importance is reported at Gravelines. The quality is said to be equal to the best Pas de Calais coal, and the beds are so situated that exploration work to determine their probable extent will not be costly.

The new census of Paris has been completed and the figures have been announced. They include all actual residents at the present time, and the totals compare as follows with those of previous years since the census has been taken on the same basis as at present:

	Population.	In-crease.	Per ct.
1881	2,239,928		
1886	2,230,945	21,617	0.9
1891	2,424,795	163,760	7.2
1895	2,511,955	87,250	3.6

Many changes may be noted among the 20 arrondissements and 80 quarters into which the municipality is divided. The largest increase was of 15.2% in the Sixteenth Arrondissement, which includes the quarters of St. Germain l'Auxerrois, les Halles, the Palais Royal and the Place Vendome; the most notable decrease was of 2.7% in the First Arrondis-

sement, which is made up of the quarters of Auteuil, Muette, Porte Dauphine and Bassins.

The death of M. Leon Say removes a man who not only possessed the qualities of a student and writer on economics, but added to them those of a man of affairs and a great financier. His services to France can hardly be overrated. He was at work almost up to the day of his death, and one hoped for still a long period of usefulness for him. AZOTE.

MEETINGS.

Name of Co.	Location of office.	Date.	Time.
Dominion Mfg. & Chemical	Mineral City, Va., 1609 No. Weber St., Colorado Springs, Colo.	May 19	11 a. m.
Jay Gould	Pittsburg Block, Helena, Mont.	" 28	3 p. m.
Julia Con.	309 Montgomery St., San Francisco, Cal.	" 25	2 p. m.
Leon Gold	415 1/2 Montgomery St., San Francisco, Cal.	" 21	1 " "
Minnesota Iron & Park View	Duluth, Minn., 106 East Pike's Peak avenue, Colorado Springs, Colo.	June 24	11 a. m.
St. Paul & Butte	Butte, Mont., 289 Broadway, New York, N. Y.	May 30	7.30 p. m.
Tom Moore	816 Equitable Building, Denver, Colo.	June 15	10 a. m.
Yellow Jacket		May 29	" "
		" 29	10 a. m.

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Delinq.	Sale.	Amt.
Alpha Con.	Nev.	16	May 12	June 2	.05
Buckeye	Utah	2	" 4	May 19	.0094
Burlington	Cal.	2	" 27	June 17	3
Caledonia	Nev.	46	" 16	June 27	.05
Camp Floyd	Utah	1	" 16	June 1	.01
Challenge Con.	Nev.	21	Apr. 29	May 29	.05
Channel Bend	Cal.	2	May 22	June 13	.05
Crown Point	Nev.	67	" 6	May 26	.20
Flint Creek	Mont.	"	" 22	June 12	.004
Gold Queen	Utah	"	" 11	" 1	.10
*Golden Sand.	Cal.	2	" 20	" 8	.01
Gould & Curry	Nev.	78	Apr. 25	May 20	.15
*Lady Emma	Cal.	"	May 25	June 25	.20
Mohawk Con.	Utah	"	June 1	" 29	.014
New Era	S. D.	3	" 1	" 19	.014
North Eureka	Utah	1	May 20	" 27	.004
Occidental Con.	Nev.	22	" 10	May 28	.10
Old Flag	Cal.	2	" 10	" 26	.03
Overman	Nev.	75	June 5	June 25	.10
*Peabody	Cal.	6	" 3	" 24	.10
Potosi	Nev.	45	May 14	" 4	.20
Ruby Bell	S. D.	13	June 1	" 19	.03
*Siskiyou Con.	Cal.	11	" 8	" 29	.01
Surprise	Cal.	1	May 30	July 1	.20
Tetro	Utah	3	" 2	May 25	.01
Utah Con.	Nev.	22	" 6	" 27	.05

*New assessment.

DIVIDENDS.

NAME OF COMPANY	Current Dividends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Amount.		
Alta Con.			\$10,000	\$50,000
* Alaska-Mexican			34,200	137,031
* Alaska-Treadwell			150,000	2,825,000
Anacosta	May 1	\$750,000		
Big Six	" 20	2,500	2,500	2,500
Boston & Mont.	" 20	\$300,000	600,000	4,025,000
Bullion Beck & Ch.			65,000	2,015,000
* Calumet & Hecla	May 15	\$50,000	1,506,000	44,850,000
* Cariboo				63,000
* Centennial-Eureka			150,000	1,650,000
C. O. D.			5,000	25,000
* Dalton & Lark	May 15	\$12,500	50,000	50,000
Dominion Coal			600,000	
* Florence	May 1	\$10,000	54,390	89,348
* Galena	" 10	\$5,000	11,000	31,000
* Gold Coin			45,000	60,000
* Golden Fleece	May 15	\$18,000	90,000	491,179
Gold & Globe Hill	" 15	\$2,250	17,250	36,625
Hecla Con.			30,000	2,130,000
Highland			25,000	3,159,918
* Homestake	May 25	\$31,250	156,250	5,868,750
Horn Silver			50,000	5,130,000
* Iron Mountain			25,000	135,000
* Isabella			67,500	90,000
Le Rol.			25,000	10,000
Mercur.			75,000	425,000
Minnesota Iron			247,500	2,992,500
* Mont. Ore Pur. Co.	May 20	\$40,000	200,000	360,000
Moon-Anchor	" 15	\$6,000	12,000	12,000
Moose			6,000	186,000
Napa Con.			30,000	770,000
* Ontario			60,000	13,235,000
Oscuela Con.			75,000	2,025,000
Otago Conchy.			1,000	1,000
Portland			60,000	683,000
Quincy			40,000	8,070,000
* Silver King			187,500	637,500
Small Hopes			25,000	3,275,000
* Smuggler-Union			50,000	50,000
Union	May 5	\$12,500	12,500	62,000
* Utah	" 10	\$2,000	10,000	142,000
* Victor	" 15	\$20,000	100,000	565,000
Victor M. & L.			9,000	33,000
* War Eagle			25,000	157,500
Totals			\$1,711,000	\$5,358,590

* April dividend paid.

This table does not give all the dividends paid by mining companies, as it is impossible to obtain a complete list of dividends declared. Many companies are close corporations and refuse to give the information. Readers of the *Engineering and Mining Journal* will confer a favor on the publishers if they will notify the *Journal* of any errors or omissions in the above table.

STOCK QUOTATIONS.

BOSTON, MASS.* Table with columns for Company Name, Location, Par value, and dates May 8 through May 14, plus Sales.

NEW YORK.* Table with columns for Company Name, Location, Par value, and dates May 9 through May 15, plus Sales.

INDUSTRIAL COAL AND COAL RAILROAD.* Table with columns for Company Name, Par value, and dates May 9 through May 15, plus Sales.

* Official quotations Con. Stock & Petroleum Exchange. Total sales, 33,750.

COLORADO SPRINGS, COLO.* Table with columns for Company Name, Par value, and dates May 4 through May 9, plus Sales.

ST. LOUIS, MO., STOCKS. Week ending May 13. Table with columns for Company Name, Office, Par value, Bid, Asked, Last Dividend.

SAN FRANCISCO, CAL.* Table with columns for Company Name, Location, Par value, and dates May 9 through May 15, plus Sales.

BALTIMORE, MD.* Week ending May 14. Table with columns for Company Name, Locs tion, Par value, Bid, Ask.

MISCELLANEOUS SECURITIES. May 14. Table with columns for Company Name, Location, Par Value, Bid, Ask.

* Official quotations and sales Colo. Springs Mg. Stock Assoc. * Board of Trade Exchange.

LONDON. April 30.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations. Lists various mining companies like N'th Americans, Alaska, De Lamar, etc.

DENVER, COLO.

Table with columns: NAME OF COMPANY, Par val, May 4, May 5, May 6, May 7, May 8, May 9, Sales. Lists companies like Addie C., Agate, Alamo, etc.

PARIS. Week ending May 1.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Divs. last year, Prices. Lists companies like Acieries de Crenset, Agues Tendras, etc.

MEXICO. Week ending May 7.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices. Lists companies like Amistad y Concordia, Angustus, etc.

VALPARAISO, CHILE. Fortnight, Mar. 28.

Table with columns: NAME OF COMPANY, Capital, Share value, Last dividend, Prices. Lists companies like Arturo Prat, Caracoles, etc.

SHANGHAI, CHINA. April 10.

Table with columns: NAME OF COMPANY, Country, No. of shares, Value, Last dividend, Price. Lists companies like Jelebu M. & Trad., Funjom M. Co., etc.

PHILADELPHIA, PA.

Table with columns: NAME OF COMPANY, Loca, Par val, May 7, May 8, May 9, May 11, May 12, May 13, Sales. Lists companies like Acety. L.H. & P., Bethlehem, etc.

SALT LAKE CITY, UTAH. Week ending May 9.

Table with columns: Name of Company, Par value, Bid, Asked, Actual selling price. Lists companies like Ajax, Alliance, Am. Nat. Gas, etc.

PITTSBURG, PA. Week ending May 13.

Table with columns: NAME OF COMPANY, Loca, Par val, Bid, Ask, Selling price. Lists companies like Mansfield, N.Y. & C. Gas Co., etc.

HELENA, MONT. Week ending May 7.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price, Date. Lists companies like Am. Dev. & M. Co., Bald Butte, etc.

DULUTH, MINN. Week ending May 9.

Table with columns: NAME OF COMPANY, Par value, Bid, Asked, NAME OF COMPANY, Par value, Bid, Asked. Lists companies like Adams Iron, Biwabik, etc.

NOTE.—In most Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Prices are in Mexican dollars.

Special Report of Jackson Bros. Values are in Chilean pesos or dollars.

All the companies are located in Colorado. Total shares sold: listed, \$2,200; unlisted, \$33,500.

Official quotations Philadelphia Stock Exchange. Total sales, 2,728.

Special Report of James A. Pollock. All the companies are located in Utah.

Official quotations Pittsburg Stock Exchange.

Special Report of Samuel K. Davis. Total shares sold, 12,640.

Special Report of J. P. Bissett & Co. The prices quoted are in Shanghai taels.

Special Report of S. E. Smith.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Name and Location of Company, Capital Stock, Shares, Assessments. Includes entries for Adams s. l. c., Etna Cons., Alaska-Mexican, etc.

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,300,000.

NOTE.—Corrections to this table are made monthly. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

CLASSIFIED LIST OF ADVERTISERS.

Air Compressors and Rock Drills
 Bullock, M. C., Mfg. Co.
 Burleigh Rock Drill Co.
 Clayton Air Compressor Works.
 Fraser & Chalmers.
 Ingersoll-Sergeant Drill Co.
 Laidlaw-Dunn-Gordon Co.
 (See Diamond Drills)

Air Hoists.
 Whiting Foundry Equipment Co.

Aluminum Bronze
 Fairbanks Co.

Amalgamators
 Bucyrus Steam Shovel & Dredge Co.
 Fraser & Chalmers.

Amalgam Plates.
 Western Plating and Mfg. Co.

Anti-Friction Metals
 Besley, Chas. H., & Co.
 Chester Steel Cast. Co.

Architects and Builders
 Berlin Iron Bridge Co.
 Pittsburgh Bridge Co.
 Pollock, Wm. B. & Sons.

Assayers and Chemists' Supplies
 Alsworth, Wm.
 Baker & Adamson.
 Baker & Christian.
 Beckler, Christian.
 Bullock & Crenshaw.
 Denver Fire Clay Co.
 Eimer & Amend.
 Henry Hill Chem. Co.

Attorneys, Corporation
 Emig, C. E.

Automatic Boiler Feeds
 D'Este & Seelye
 Fenberthy Injector Co.

Babbitt's Metal
 Besley, Chas. H., & Co.

Bankers and Brokers
 Arkell, E., & Co.
 Bartle & Co.
 Bonbright, W. P., & Co.
 Bretung, E. N.
 Carduff, A. A.
 Crandall & Huff.
 Crisp, Cr. Syn. Inv. Co.
 Decker, L. K.
 Duer, G. A. C.
 Dorsey, H. H.
 Doubleday, Rope & Co.
 Edsall, Clarence & Co.
 Fall, Brooks & Cramer
 Farnsworth, C., & Co.
 Fitts, G. W., & Sons.
 Fletcher, C. S., & Co.
 Freyschlag, Kirby & O.
 Gardner & Co.
 Grant, E. H.
 Handy & Harman.
 Harriott, W. M.
 Hendrickson, W. J.
 Heron Bros.
 Hodgins, L. W.
 Hicks & Benzie.
 Johnson, L. L.
 Keith, F. M.
 Kenrick, W. F.
 Kinney, M.
 Krellander, C. F. & Co.
 Ketting
 Carpenter, Geo. B., & Co.
 Hendrie & Bolthoff
 Mfg. Co.
 Leiphelmer, N.
 Miller, Chas. N., & Co.

Belt Lacing
 Bristol Co.

Blasting Caps.
 Metallic Cap Mfg. Co.

Blasting Batteries
 Climax Fuse Co.
 Lau, J. H., & Co.

Blowers, Pressure
 Connorsville Blower Co.

Boilers
 American Engine Co.
 Denver Eng. Wks. Co.
 Enterprise Boiler Co.
 Fraser & Chalmers.
 Heine Safety Boiler Co.
 Philadelphia & N. G. Wks., Ltd.

Brattice Cloth
 Besley, Chas. H., & Co.

Brewers
 Pabst Brewing Co.

Brick Machinery
 Freese, E. M., & Co.

Bridges
 Berlin Bridge Co.
 Pittsburgh Bridge Co.
 Scaife, Wm. B. & Sons. (See Machinery.)

Car Wheels.
 Whiting Foundry Equipment Co.

Carbons
 Bishop, Victor, & Co.
 Lexow, Theodor.

Chain and Link Belting (See Belting.)

Chemicals
 Baker & Adamson.
 Bullock & Crenshaw.
 Eimer & Amend.
 Henry Hill Chem. Co.
 Rosessler & Hasslacher Chemical Co.
 Solvay Process Co.
 Western Chemical Co.
 Maryland Loan Co.
 Potts, F. A., & Co.
 Stockney, Conyngham & Co.
 Ward & Olyphant.

Chilled Castings.
 Whiting Foundry Equipment Co.

Coal Cutters
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Leyner, J. Geo. (See Machinery.)
 Link Belt Machinery Co.

Compressors.
 Clayton Air Compressor Works.
 Norwalk Iron Works Co.

Concentrators, Crushers, Pulverizers, Separators, Etc.
 Allis, Ed. P., & Co.
 Beckett Foundry & Machine Co.
 Blake, Theo. A.
 Boston Ore Machinery Co.
 Bradley Pulverizer Co.
 Colorado Iron Works.
 Denver Eng. Wks. Co.
 Dodge Mining Machinery Co.
 Engeschach Mach. Mfg. Co.
 Fraser & Chalmers.
 Free Vanner Concentrator.
 Hendrie & Bolthoff Mfg. Co.
 Joplin Mach. Co.
 Krom, S. B.
 Krupp, F.

Link Belt Machinery Co.
 McCully, R.
 Scoville, H., & Co.
 Stedman Foundry & Mach. Co.
 Walburn-Swenson Mfg. Co. See Machinery Contractors. (See Machinery.)

Copper Dealers and Producers.
 American Metal Co.
 Arizona Copper Co.
 Atlantic Mining Co.
 Balbach S. & Ref. Co.
 Baltimore Cop. Wks.
 Bath, H., & Son.
 Boston Mfg. Co.
 Bridgeport Copper Co.
 Butte & Boston Mfg. Co.
 Canadian Copper Co.
 Copper Queen Mfg. Co.
 Detroit Copper Co., Ltd.
 Elliott's Metal Co., Ltd.

Corrugated Iron
 Berlin Iron Bridge Co.
 Cincinnati Corrugating Co.
 Scaife, W. B. & Sons.
 Sikes Steel Roofing Co.

Cranes.
 Whiting Foundry Equipment Co.

Crucibles, Graphite, Etc.
 Denver Fire Clay Co.
 Dixon, Jos. Crucible & Machine Works.
 Gunnar & Sealers
 D'Este & Seelye.

Cyanide.
 Rosessler & Hasslacher Chemical Co.

Diamonds
 Bishop, Victor, & Co.
 Lexow, Theodor.

Diamond Drills
 Bishop, Victor, & Co.
 Bullock Mfg. Co., M. C.
 Denver Fire Clay Co.
 Sullivan Machinery Co. (See Air Compressors and Rock Drills.)

Draughtmen.
 Young, Wm. R.

Drawing Materials.
 McCoy & Houlahan.
 McIntyre, W. H., & Co.
 Miller, J. W., & Co.
 Morath Investm't Co.
 Parsons & Gandy.
 Partridge & Stover.
 Peek, Frank G.
 Prentice, Russell.
 Frouditt, J. W., & Co.
 Reed Bros.
 Riley, J. W.
 Rossland Commercial Agency
 Sheldon, E. C.
 Sill & Sill.
 Sim, Beers & Co.
 Smith, C. H.
 Snow, E. P.
 Sprague, J. A.
 State Trust Co.
 Watters, Marshall & Co.
 Wandell, H. V.
 Weyand Bros.
 Welles, E. F.
 White, Fred. B.
 White, Samuel.
 Williamson, W. W.
 Woods Investment Co.
 Wyoming Mfg. Bureau
 Mayer, Andrew
 Jeffrey Mfg. Co.
 Link Belt Machinery Co.
 New York Belting & Packing Co., Ltd.

Dryers.
 Brown, Horace T.
 Cummer, F. D. & Sons Co.
 Denver Eng. Wks. Co.
 Hunt, C. W.
 Hendrie & Bolthoff
 Mfg. Co.
 Truax Mfg. Co.

Educational Institutions
 Arizona School of Mines.
 Columbian University.
 Chicago School of Assaying.
 Correspondence School of Mines.
 Lehigh University.
 Mass. Inst. of Technology
 Michigan Mining School.
 Rose Polytechnic Institute.

Electrical Batteries
 Macbeth, James, & Co.
 Electric Machinery and Supplies
 Besley, Chas. H., & Co.
 Link Belt Mach. Co.
 Card Electric Co.
 Oxonite Co., Ltd.
 Repauno Chem. Co.
 Stiles, Geo.
 Walker Mfg. Co.
 Westinghouse Elec. Mfg. Co.
 Jeffrey Mfg. Co.

Elevators, Conveyors and Hoisting Machines
 Brown Hoist & Conv. Mach. Co.
 Caldwell, H. W., & Co.
 California Wire Wks.
 Cooper, Hewitt & Co.
 Crook, W. A., & Bros. Co.
 Denver Eng. Wks. Co.
 Electrical Engineer- ing Co.
 General Electric Co.
 Jeffrey Mfg. Co.

Excavators
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Southern & Co.
 Vulcan Iron Works.

Fire-Brick and Clay
 Denver Fire Clay Co.
 Moore, S. L., & S. Co.
 Pollock, W. B. & Sons.
 Sheffield Car Co.

Furnaces
 Brown, Horace.
 Dodge Mining Mach Co.
 Hoskins, Wm.

Fuses, Powder
 Ingersoll-Sergeant Drill Co.

Fuse, Safety.
 Climax Fuse Co.

Gas Engines.
 Norman, J., & Co.

Gas Works
 Pollock, Wm. B. & Co.
 Wood, R. D., & Co.

Gauges, Recording, Etc.
 Bristol Mfg. Co.

Gearing
 Besley, Chas. H., & Co.
 Chester Steel Cast. Co.
 Fraser & Chalmers. (See Machinery.)

Grease, Graphite, Etc.
 Besley, Chas. H., & Co.
 Dixon, Jos., Cruc. Co.
 Harvay's Steel
 Pierce & Miller Engineering Co.

Heavy Machinery
 Denver Eng. Works Co.
 Fraser & Chalmers.
 Heine Safety Boiler Co.
 New York Belting & Packing Co. Ltd.

Injectors.
 Fenberthy Injector Co.

Insulated Wires and Cables
 Okonite Co., Ltd. The

Insurance Companies
 Hartford Steam Boiler Inspect'n and Ins. Co.
 Mutual Life Insurance Co.

Joint Fittings
 Tight Joint Co.

Lead Linings for Chlorination Tubs.
 Raymond Lead Co.
 Locomotives
 General Electric Co.
 Hunt, C. W., Co.
 Porter, H. K., & Co.

Dealers in Mining, Milling and Other Machinery
 Allis, Edw. P., & Co.
 Bacon, E. C.
 Beckett Fdy. & Mach. Co.
 Besley, Chas. H., & Co.
 Blake, T. A.
 Boston Ore Mach'y Co.
 Bradley Pulverizer Co.
 Buckeye Engine Co.
 Bullock, M. C. Mfg. Co.
 Caldwell, H. W., & Co.
 Card Electric Co.
 Carpenter, Geo. B., & Co.
 Channon, H. Co.
 Colorado Iron Works.
 Connors' Blower Co.
 Crandall & Huff.
 Crook, W. A., & Bros. Co.
 Davis-Colby Ore R. Co.
 Denver Eng. Wks. Co.
 Dodge Mfg. Mach. Co.
 Ellison, Wm., & Sons.
 Engelbach Mfg. Co.
 Field & Goetzman.
 Fraser & Chalmers.
 Hammond, Mfg. Co.
 Heine Safety Boiler Co.
 Hendrie & Bolthoff Mfg. Co.
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Jessop, W., & Sons, Ltd.
 Leyner, J. Geo.

Manganese Steel.
 Taylor Iron & Steel Co.

Metal Dealers
 American & Dev. Mfg. Co.
 American Metal Co.
 Am. Zinc-Lead Co.
 Baker & Co.
 Bath, Henry & Son.
 Besley, Chas. H., & Co.
 Bridgeport Copper Co.
 Cookson & Co.
 Elliott's Metal Co., Ltd.
 Eureka Co.
 Foster, Blackett & Wilson.
 James & Shakspeare.
 Johnson, Matthey & Co.

Metallurgical Works and Ore Processors' Processes
 American Dev. & Mfg. Co.
 Amer. Zinc Lead Co.
 Baker & Co.
 Balbach S. & Ref. Co.
 Baltimore Copper Wks.
 Bridgeport Copper Co.
 Canadian Copper Co.
 Cookson & Co.
 Denver Eng. Wks. Co.
 Eureka Co.
 Electro Cyanide gold & silver Extr'n Co.
 Foster, Blackett & Wilson.
 Fraser & Chalmers.
 Gates Gold Extrac- tion Co.
 Montana Ore Pur- chas- ing Co.
 Joplin Machine Wks.
 Kan. City S. & Ref. Co.
 Ledoux & Co.
 Montana Ore Pur- chas- ing Co.
 Newark Pulv'ng Wks.
 Orford Copper Co.
 Pennsylvania Salt Works.
 Ricketts & Banks.
 Russell Process Co.
 State Ore Sampling Co.
 Taylor Iron & Steel Co.
 Webster, Camp & Lane Mfg. Co.

Mine Cars
 Crandall & Huff.
 Denver Eng. Wks. Co.
 Hendrie & Bolthoff Mfg. Co.
 Hunt, C. W., Co.
 Nelsonville Foundry & Machine Co.
 Sheffield Car Co.
 Whiting Foundry Equipment Co. (See Machinery.)

Mine, Mill and Smelters Supplies.
 Carpenter, Geo. B., & Co.
 Crandall & Huff.
 Denver Eng. Wks. Co.
 Dodge Mining Machinery Co.
 Gates Iron Works.
 Park'ist & Wilkinson.
 Rosessler & Hasslacher Chemical Co.
 Stieren, William E. (See Machinery.)

Mining and Land Companies
 American Dev. & Mfg. Co.
 Copper Queen Mfg. Co.
 Detroit Copper Mfg. Co.
 Eureka Co.
 Arizona Copper Co.
 Boston & Mont. Mfg. Co.
 Butte & Boston Mfg. Co.
 Clark Land & Mines Co.
 Canadian Copper Co.

Ore Cars.
 Truax Mfg. Co. Ltd.

Ore Hoisters
 Brown, Horace F.
 Cummer, F. D., & Sons Co.
 Davis-Colby Ore Roaster Co.

Ore Testing Works
 Hunt, F. F.
 Ledoux & Co.
 Montana Ore Pur- chas- ing Co.
 New York Belting & Packing Co., Ltd.
 Wyckoff & Son, A.

Perforated Metals.
 Aitchison, E., Perf. Metal Co.
 Fraser & Chalmers.
 Harrington & King Perforating Co.

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 Connorsville Blower Co.

Pressure Regulators
 D'Este & Seelye, (Curtis).

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 Arms & Explosives.
 Australian Mg. Stand.
 Bullionist.
 Colliery Guardian.
 Denver Republican.
 Economic Mining.
 El Minero Mexicano.
 Electrical Plant & Works.
 Electrical Industry.
 Pumps.
 Black, Geo. F. Mfg. Co.
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Quicksilver
 Banks Co.

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 C. B. & Quincy R. R.
 Denver & Rio Grande R. R.
 Denver, Leadville & Gunnison Ry.
 Florence & Cripple Creek R. R.
 Illinois Central R. R.
 Midland R. R. of Kentucky.
 Rio Grande Southern R. R.
 U. P., D. & G. R. R.

Railroad Supplies and Equipment
 Carter, Geo. B., & Co.
 Channon, H. Co.
 Crandall & Huff.
 Fairbanks Co.
 (See Machinery.)

Regulators, Damper, Vent, etc.
 D'Este & Seelye Co.
 Eddy Valve Co.
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Return Steam Traps
 D'Este & Seelye, (Curtis).

Rolling Mills. (See Air Compressor.)

Roofing
 Berlin Iron Bridge Co.
 Cincinnati Corrugat- ing Co.
 Scaife, Wm. B. & Sons
 Shiffler Bridge Co.
 Sikes Steel Roofing Co.

Rubber Goods
 New York Belting & Packing Co., Ltd.

Scales.
 Fairbanks Co.

Screens
 Aitchison, R., Perf. Metal Co.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.
 Harrington & King Perforating Co.
 Link Belt Machinery Co.
 Ludlow-Saylor Wire Co. (See Machinery.)

Second Hand Machinery
 Robinson & Orr.

Separators
 Dodge Mining Machinery Co.

Shoes and Dies
 Chester Steel Cast. Co.
 Corome Steel Works.
 Crescent Steel Co.
 Denver Eng. Wks. Co.

Shovels Steam
 Bucyrus Steam Shovel & Dredge Co.
 Marion Steam Shovel Co.
 Southern & Co.

Smelting and Refining Works
 Balbach S. & Ref. Co.
 Baltimore Copper Wks.
 Bridgeport Copper Co.
 Elliott's Metal Co., Ltd.
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 Mathison Smelting Co.
 Smelt, Co.

Steam Traps.
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 Bethlehem Iron Co.
 Carpenter Steel Co.
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 Moore, S. L., & Sons Co.
 Denver Eng. Wks. Co.
 Gates Iron Works.
 Williams Mfg. Co.

Telegraph Wires and Cables
 Okonite Co., Ltd., The.
 Temperature Regulators
 D'Este & Seelye, (Curtis).

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 Williams Bros.

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 New York Belting and Packing Co., Ltd

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 Leffel, James & Co.
 Stillwell-Bierce & Smith Valle Co.

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 D'Este & Seelye Co.
 Eddy Valve Co.
 Fairbanks Co.
 Jenkins Bros.

Ventilators
 Bullock, M. C. Mfg. Co.
 Fraser & Chalmers.
 New York Belting and Packing Co., Ltd

Water-Wheels
 Leffel, James, & Co.
 Stillwell-Bierce & Smith-Valle Co.

Well Drilling Machinery
 Sullivan Mach'y Co. | Williams Bros.

Wharfage
 Lambert's Wharfage Co.

Wheels, Car
 Chester Steel Cast. Co.
 Sheffield Car Co.
 Taylor Iron & Steel Co.

White Lead
 Cookson & Co.
 Foster, Blackett & Co.

Wire Cloth
 Aitchison, R., Perf. Metal Co.
 Barnum, E. T.
 Harrington & King Perforating Co.

Wire Rope & Wire
 Hunt, C. W., Co.
 Besley, Chas. H., & Co.
 Broderick & Bacon
 Rope Co.
 California Wire Wks.
 Carpenter, G. B., & Co.
 R'bling, J. A. Sons & Co.
 Ropeways Syndicate
 Channon, H. Co.
 Cooper Hewitt & Co.

Wire Rope Tramway
 Brown Hoist & Conv. Machine Co.
 Colorado Iron Works.
 Denver Eng. Wks. Co.
 Fraser & Chalmers.

advertising out in the wrong direction—missed the Engineering and Mining Journal.

POSITIONS FREE ADVERTISING VACANT.

Inquiries from employers in want of Superintendents, Engineers, Metallurgists, Chemists, Mine or Furnace Foremen, or other assistance of this character, will be inserted in this column WITHOUT CHARGE, whether subscribers or not.

The labor and expense involved in ascertaining what positions are open, in gratuitously advertising them and in attending to the correspondence of applicants, are incurred in the interest and for the exclusive benefit of subscribers to the ENGINEERING AND MINING JOURNAL.

Applicants should inclose the necessary postage to insure the forwarding of their letters.

1447--WANTED--FOR A GOLD MINE in Georgia, competent assistant foreman; also nine miners experienced in the use of power drills as head men; chance for family without children to take charge of boarding house for 40 men; references required state wages expected for steady work. Address GOLD STAR, ENGINEERING AND MINING JOURNAL.

1448 WANTED.--A CHEMIST WELL UP in the manufacture and analysis of salts. State age, experience and salary expected. Address SODIUM, ENGINEERING AND MINING JOURNAL.

1449 WANTED--ASSAYER AND CHEMIST at gold mine using cyanide process. Have references and experience. Address C. N., ENGINEERING AND MINING JOURNAL.

1452 WANTED -- AN ACTIVE, AMBITIOUS, young Mining Engineer to act as Assistant in California, British Columbia, and perhaps South Africa. Good recommendations required. Address, ACTIVE, ENGINEERING AND MINING JOURNAL.

1453 WANTED A COMPETENT MAN TO take charge of sulphuric, nitric and muriatic acid departments; state age and experience. Address MODERN, ENGINEERING AND MINING JOURNAL.

1456 WANTED--A DRAUGHTSMAN WHO has had experience in designing and building blast furnaces. State qualifications, references, etc. Address P. Z., ENGINEERING AND MINING JOURNAL.

1457 WANTED--FOR FREE MILLING and smelting property (gold) near Prescott, Arizona, competent mine superintendent who can make his own assays and run his own levels; must have free-edged references; developed property. Address FREE MILLING, ENGINEERING AND MINING JOURNAL.

1458 WANTED--QUARRY FOREMAN, A hustler, for Canada. State experience, wages expected (common labor is \$1 per day), etc. Address A. A. C., ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

Advertisements for SITUATIONS WANTED will be charged only 10 cents a line.

POSITION WANTED AS ASSAYER AND assistant by young graduate who is at present employed in Colorado gold mine. Considerable practical experience, and has studied abroad. Can survey, keep books and is familiar with cyanide process. Speaks French and some Spanish. Best of references. Address I. S., ENGINEERING AND MINING JOURNAL. No. 17,409, May 30.

MINING ENGINEER, GRADUATE, AGED 28, single, would like a position as assistant manager or superintendent in charge of mines or reduction works. Salary no object. Best references. Address MINING, ENGINEERING AND MINING JOURNAL. No. 17,407, May 30.

CHEMIST (AGE 30), EXPERIENCED IN experiment station work and in control and running of fertilizer factory, desires position. Can design and erect small fertilizer factory. Best references. Address Box 1,492, ENGINEERING AND MINING JOURNAL. No. 17,410, May 30.

A MILL MAN, WITH 14 YEARS' PRACTICAL experience with the chloridizing and leaching of silver ores in Mexico and United States, is now open for engagement. A I references. Address J. H. J., 837 18th St., Denver, Colo. No. 17,419 June 13.

EXPERIENCED, ACCURATE, DOUBLE ENTRY bookkeeper, stenographer and typewriter, familiar with details of mining-office work, is open for engagement. References. Address W. R., 1645 C'ampa street, Denver, Colorado. No. 17,430, May 30.

CHEMIST AND METALLURGIST, WITH many years' experience, is open for engagement. Would like position as chemist or superintendent of smelting works, chlorination or cyanide mills. First-class references. Address M. A. M., 205 Boston Building, Denver, Colo. No. 17,417, June 13.

ENGINEERING GRADUATE, 15 YEARS' practical experience with large coal corporations in all the departments of coal mining and trade from preliminary prospecting to mine management and general sales agent, is open for engagement, home or abroad. Can guarantee most economical American methods. Best references. Address L. U., ENGINEERING AND MINING JOURNAL. No. 17,401, May 23.

A METALLURGIST, LEAD AND COPPER, in charge of large works in Mexico, wishes engagement with reliable company in the States. Successful experience. Best references. Address MEXICO, ENGINEERING AND MINING JOURNAL. No. 17,413, June 27.

POSITION WANTED BY MECHANICAL engineer; thoroughly posted in foundry, machine, boiler and architectural iron shops, drawing office, etc.; or would take charge of large steam plant; 20 years' experience; will go anywhere. Address B. J. H., ENGINEERING AND MINING JOURNAL. No. 17,415, May 23.

EXPERIENCED, PRACTICAL, ACCURATE Chemist and Metallurgist wishes position as Chemist or Assistant in acid works, smelting works, steel works, or blast furnace. Low salary. Address PRACTICAL, ENGINEERING AND MINING JOURNAL. No. 17,418, May 30.

Contracts Open.

TREASURY DEPARTMENT, OFFICE SUPERVISING ARCHITECT, Washington, D. C., May 19th, 1896.--Sealed proposals will be received at this office until 2 o'clock P. M., June 16th, 1896, and opened immediately thereafter, for all labor and materials required for the erection and completion of an operating wing to the U. S. Marine Hospital at Chicago, Ill., in accordance with the drawings and specification therefor, copies of which may be had at this office or the office of the Superintendent of Construction at Chicago, Ill. With each bid must be enclosed a certified check for a sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids or to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked "Proposal for the Erection and Completion of an Operating Wing to the U. S. Marine Hospital, Chicago, Ill.," and addressed to Wm. Martin Aiken, Supervising Architect. Orig.

STEEL-FRAMED CONSTRUCTION AND REPAIR Shop at U. S. Naval Station, Port Royal, S. C.--Bureau of Yards and Docks, Navy Department, Washington, D. C.--Separate sealed proposals, in duplicate, for the following object, endorsed proposals for "Construction and Repair Shop," at U. S. Naval Station, Port Royal, S. C., will be received at this Bureau until May 22d, 1896. Specifications and blank forms of proposal will be forwarded upon application to this Bureau or the commandant of the Naval Station, Port Royal, S. C. Bidders are expected to fully inform themselves of the character of the work required, by visiting the station, where plans may be examined, and, if necessary, obtained. A certified check of two thousand (\$2,000) dollars must accompany the proposal as a guarantee that the bidder will execute the required contract after his bid has been accepted. Responsible security will be required for the faithful performance of the contract and the right is reserved to reject any or all proposals not deemed advantageous to the Government, and to waive defects. E. O. MATTHEWS, Chief of Bureau.

WATER-WORKS.--Sealed proposals, marked "Proposals," for the construction of a system of water-works will be received by the Board of Water Commissioners of Brocton, N. Y., until May 18, 1896. The estimated quantities are: 8,900 ft. of 12-in. main, 2,800 ft. of 10-in. main, 2,400 ft. of 8-in. main, 10,600 ft. of 6-in. main, 13,300 ft. of 4-in. main, 50 fire hydrants and the necessary gates and specialties; 17,000 cu. yds. earth excavation, 20 cu. yds. Portland cement concrete.

ELECTRIC LIGHT PLANT.--The Common Council of the City of Millville, N. J., will at their meeting, to be held June 5, 1896, receive sealed bids for the erection of an electric light plant, with a capacity of running 100 arc and 1,000 incandescent lamps. The area to be covered to be 1 1/2 miles of wiring and poles. The bids are wanted with and without the brick building necessary for such a plant. The horse-power of engine to be not less than 200. Two boilers will be wanted. For further information, apply to N. P. HOWELL, Chairman Committee.

STEEL-FRAMED CONSTRUCTION AND REPAIR shop.--Bureau of Yards and Docks, Navy Department, Washington, D. C.--Separate sealed proposals, in duplicate, for the following object, endorsed, "Proposals for the Construction and Repair Shop," at U. S. Naval Station, Port Royal, S. C., will be received at this Bureau until May 22d, 1896. Specifications and blank forms of proposal will be forwarded upon application to this Bureau or the commandant of the Naval Station, Port Royal, S. C. Bidders are expected to fully inform themselves of the character of the work required, by visiting the station where plans may be examined, and, if necessary, obtained. E. O. MATTHEWS, Chief of Bureau.

ELECTRIC LIGHT PLANT.--The Common Council of the City of Millville, N. J., will receive sealed bids until June 5th for the erection of an electric light plant with a capacity of running 100 arc and 1,000 incandescent lamps, the area to be covered to be 1 1/2 miles of wiring and poles. The bids are wanted with and without the brick building necessary for such a plant, the horse power of engine to be not less than 200. Two boilers will be wanted. For further information apply to N. P. HOWELL, Chairman Committee.

WATER-WORKS.--Notice is hereby given that until May 18th, 1896, the City Council of the City of Franklin, Ky., will receive sealed bids for the erection of a system of water-works, or any part thereof, according to the plans and specifications of J. A. Holmboe, Engineer, which plans and specifications can be seen after May 1st, 1896, at the office of J. A. Holmboe, 110 Columbia Building, Louisville, Ky., or by calling on JAS. N. LARUE, Mayor, at Franklin, Ky.

WATER-WORKS.--Sealed proposals will be received by the Board of Water Commissioners of the Village of Angelica, N. Y., until June 3, 1896, for furnishing the material and constructing a gravity system of water-works for said village. There will be required approximately the following: 680 tons (about 8 1/2 miles) of cast-iron pipe, 35 fire hydrants, 32 gate valves and boxes, concrete-lined reservoir of 1/2-million gallon capacity, receiving basin, etc. Bids will be received for furnishing any of the materials mentioned above or for constructing the work complete. Plans may be seen and specifications and blank forms of proposal procured at the office of the Secretary of the Board, Angelica, N. Y., or at the office of the Engineer, J. F. Witmer, Rooms 65 and 66, Chapin Block, Buffalo, N. Y.

WOODEN DAM.--Bids will be received by Clarion Water Company until June 2, 1896, for the construction of a Wooden Dam and laying and burying 4,400 ft. of 8-inch screw pipe. Plans and specifications at office of W. H. ROSS, Secretary, Clarion, Pa.

SIX-FT. STEEL CONDUIT.--Tenders will be received by registered post only, addressed to the Chairman of the Board of Control, City Hall, Toronto Ont., until June 3, 1896, for the work of laying the proposed new 6-ft. steel conduit, to replace the present wooden one, from the connecting crib on Toronto Island to the belle-buoy crib in Lake Ontario, a distance of about 2,358 lin. ft., including the laying of the necessary tanks, valves and connections. Drawings and specifications may be seen, and forms of tender obtained, at the office of the City Engineer, Toronto, Canada, on and after May 20, 1896. A deposit in the form of a marked check payable to the order of the City Treasurer, for the sum of 5% on the value of the work tendered for up to \$1,000, and 2 1/2% of the value of the work tendered for over that amount must accompany each and every tender. Tenders must bear the bona fide signature of the contractor and his sureties, or they will be ruled out as informal. R. J. FLEMING, Chairman Board of Control.

WATER-WORKS --Sealed proposals will be received by the Secretary of the Borough Council until the 4th day of June for the construction and furnishing of all material for the complete system of water-works. Each proposal must be accompanied by a certified check, and all proposals must be on blanks furnished, and shall be sealed and addressed to W. M. Hays, Secretary of Ligonier Council, Pa. Plans and specifications can be seen at the office of L. W. FOGG, Engineer, Latrobe, Pa., W. M. HAYS, Secretary.

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FOR SALE, CHEAP.

One 9 x 14 cylinder Porter Locomotive, with saddle tank, six 28-in. drivers, coal burner, 36-in. gauge, steam brake; weight 11 1/2 tons. Immediate delivery in Western Pennsylvania.

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Also a small car of light T Rails for relaying.

FOR SALE

Owing to death of proprietor, **LABORATORY** having an established reputation.

For further particulars address
JOHN H. WESTENHOFF,
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FOR SALE—Hoisting Engines, etc. All in good serviceable condition and can be seen near Chicago. Two 12 1/4 x 15 Ledgerwood Double Cylinder, Double Friction Drum Mine Hoisting Engines (weight, 35,000 lbs.), 60-in. Drums, Reversible Link Motion. One 12 x 15 Double Cylinder Single Drum Copeland & Bacon Hoisting Engine, 48-in. drum; and a large number of Wheel Scrapers, Drag Scrapers, Plows, etc., and General Contractors' Plant. Correspondence and inspection solicited. **McARTHUR BROS. CO.,** 184 La Salle St., Chicago.

FOR SALE, MACHINERY.

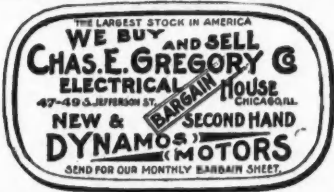
Owing to radical changes in our Power House, we offer for sale the following, all in good condition:

- One 300 H. P. Cross Comp. Engine, extra heavy.
 - One 160 " " " " " " " " " " " "
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 - One 1,000 " " Hoppe's Live Steam Purifier.
 - One 300 " " " " " " " " " " " "
 - Two Bipolar Dynamos, 100 H. P. each, "500 volts,"
- For particulars, etc., address
CALUMET EL. ST. RY. CO., Chicago, Ill.

FOR SALE.

- One Gates Spring Crusher.
- One Set Gates Pulverizing Rolls,
- Fifteen Gates Concentrations.
- One 10 x 4 Blake Crusher.
- One 30 H. P. Gasoline Engine.

DEWEY BROTHERS,
604 Boston Bldg., Denver, Colo.



ASSESSMENT NOTICE.

SILVER KING MINING COMPANY,
Location of principal place of business, San Francisco, Cal.; Location of Works, Pioneer Mining District, Pinal County, A. T.

Notice is hereby given that at a meeting of the Board of Directors, held on the 7th day of May, 1896, an assessment (No. 14) of TWENTY-FIVE CENTS (25c.) per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the Company, No. 310 Pine street, Rooms 15 & 17, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 16th day of June, 1896, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Tuesday, the 14th day of July, 1896, to pay the delinquent assessment together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. PEW, Secretary; Office, No. 310 Pine street, Rooms 15 & 17, San Francisco, Cal.

Town Water-Works, Hydraulic Miners and Others.

One Worthington Pump, capacity 1,500,000 gallons. Price f. o. b., \$3,500.
6,000 feet 20-inch Steel Pipe, flanged. 95c. per foot f. o. b.
Two miles of 12-inch Wrought Iron Pipe. 45c. per foot f. o. b.

H. A. JUDD, New London, N. C.

WATER COLOR DRAWINGS FOR SALE.

Six exquisite water color landscapes by D. Fowler. Handsomely framed—three in gold and three in gold and white. These paintings can be seen at the "Visitor's Headquarters" of the ENGINEERING AND MINING JOURNAL. Address . . .

ARTIST, care of Engineering and Mining Journal,
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GOLD MINES FOR SALE.

WE have some splendid propositions for you on dividend paying gold mines in Cripple Creek and Gilpin County districts. Investigate.

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On Pacific Coast. Correspondence solicited.
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Secretary, Gold Mining Exchange,
No. 628 Sacramento St., San Francisco, Cal.

FOR SALE—Practical Miner and Assayer will sell one-half interest in group of four Gold Mines, partially developed, in order to complete systematic development. For full particulars address **W. J. WEATHERBY,** Cooney, N. Mex.

FOR SALE.

A fair-sized Foundry and Machine Shop with additional land, in good condition and well equipped for medium heavy work; located on a railroad; within eight miles of New York. Can be seen in operation for few weeks only. Owners giving up business. Terms easy. Call or address
Room 41, 22 William St., New York.

FOR LEASE.

An Anthracite Colliery Property in the Borough of Shamokin, Northumberland County, Pa. Breaker comparatively new, and equipped with the latest coal-breaking and screening machinery; capacity about one thousand tons per day and now in operation. The property is in excellent condition and a large quantity of coal opened.

For further information apply to
IRVING A. STEARNS, Manager,
Wilkes-Barre, Pa.

FOR SALE.

GOLD AND COPPER MINES, extensive, high-grade, well developed. **BOOTH & BRINTON,** Portland, Oregon.
N. B.—Make a note of this advertisement, as you may not see it again.

DIVIDENDS.

ONTARIO SILVER MINING COMPANY,
MILLS BUILDING, 15 BROAD STREET,
NEW YORK, May 18th, 1896.
DIVIDEND NO. 202.

A dividend of TEN (10) CENTS PER SHARE has been declared, payable at the office of the company, San Francisco, or at the transfer agency in New York, on June 1st.

Transfer books close on the 25th inst.
LOUNSBERRY & CO.,
Transfer Agents.

Received Too Late for Classification.

1459 WANTED—A FIRST-CLASS ASSESSOR and thorough ore sampler to take charge of a branch office in the Mexican Republic, through which ores are purchased and bullion sold, and a general mining and milling supply business done. Promptness, system, accuracy and thoroughness essential qualities. Address **CARBON, ENGINEERING AND MINING JOURNAL.**

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Mines Leased, Bonded, Bought, Developed and Operated.

Correspondence from Owners of Mining Properties and Parties Seeking Mining Investments solicited.

—References on Application.—

Moreing & Neil Code Used.

Cable Address, - **ADAMCO, BUTTE.**

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CLAYTON ELY EMIG,
Lawyer:

Wardner Building, 9th and F Sts., Washington, D. C.

Practices before the Departments of the Government; all the Courts of the District of Columbia and Maryland, and the Supreme Court of the United States.

THE CHRYSOMETER. A Chemical Assay Outfit for Gold, all complete, with chemicals for 100 assays, for \$25.00. Also the Prospector's Outfit for \$10.00.
J. W. PETTEE, Sole Manufacturer,
907 17th Street, Denver, Colo.

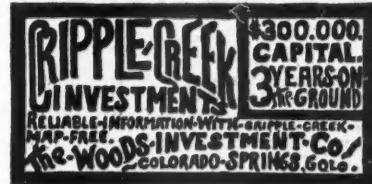
HANDY & HARMAN,

Dealers in Bullion, Specie and Bonds,

No. 32 Nassau Street, New York.

Sovereigns, Francs and Marks, Doubloons, Mexican Dollars, Fine Silver Bars, Fine Gold Bars. Special attention given to Investments and to Consignments of Silver and Gold Bullion of all grades.

REFERENCE: { American Exchange National Bank, New York City.



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REDUCED RATES TO PITTSBURG.

The Prohibition National Convention will meet in Pittsburgh May 27th to 29th.

For this occasion the B. & O. R. R. Co. will sell Excursion Tickets from all points on its lines for all trains of May 24th to 26th, inclusive, valid for return passage until May 30th, at one single fare for the round trip.

Tickets will also be sold at coupon stations of all connecting lines.

The B. & O. maintains a double service of fast express trains, with through Pullman cars attached, between Philadelphia, Baltimore, Washington and Pittsburgh. Be sure your ticket reads via "Picturesque B. & O."

MISCELLANEOUS WANTS.

WANTED—A PARTNER IN A TIN MINE in Pennsylvania. Address **MRS. C. C. SMITH,** Williamsburg, Mass.

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77 Pine St., New York,
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Weighing, Sampling and Assaying of Ores, Mattes,
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Refiners of Copper. . . .
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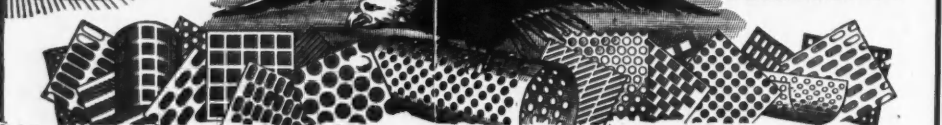
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