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CONTENTS.

Good Mine Surveying.....	369		
Increased Output of Copper in the United States.....	369		
Steel Production in the United States in 1895.....	369		
The African Gold Output and the World's Requirements.....	370		
Gold Production in Australia.....	370		
Books Received.....	371		
Mountain Transportation of Heavy Stamp-Mill.....	H. H. Miller 371		
Rand Labor Question.....	Penton 371		
Gold Mining in the South.....	Courtenay De Kalb 371		
Our Gold Producing Resources.....	John H. Piper 372		
Abstracts of Official Reports.....	372		
The Nickel Plating of Wood.....	372		
* Black Hills, South Dakota.....	373		
A Hypothetical New Hydraulic Cement.....	A. D. Elbers 373		
On the Action of the X Rays Upon the Diamond.....	374		
Iron and Steel Making Resources of South Africa.....	375		
* The Hall Automatic Water Still.....	375		
* Wire Rope Tramway at the Bunker Hill & Sullivan Mines, Idaho.....	376		
The Action of Electric Currents on Mine-Surveying Instruments.....	W. Lenz 377		
Demolition of a Large Mill Chimney.....	378		
Recent Decisions Affecting the Mining Industry.....	378		
Patents Relating to Mining and Metallurgy.....	378		
Notes: Increase in Electric Traction in England, 372—Electric Light and Power at Cripple Creek, 374—Power for the Hogback Tunnel, Colorado, 374—Copper Coking in England, 375—Action of Sulphur Vapor on Copper, 376—Japanese Enterprise, 378—The Tehuantepec Railroad, 378.			
* Illustrated.			
Personal..... 379	New Mexico..... 382	Prices, Statistics, Imports and Exports 386	Colo. Springs..... 388
Obituaries..... 379	North Carolina..... 383	Foreign and Domestic Coms..... 387	Salt Lake City..... 388
	Oregon..... 383	Copper..... 387	San Francisco..... 388
	Pennsylvania..... 383	Tin..... 387	London..... 389
	Texas..... 383	Lead..... 387	Paris..... 389
Societies and Technical Schools..... 379	Utah..... 383	Spelter..... 387	
	Virginia..... 383	Antimony..... 387	
	Washington..... 383	Nickel..... 387	
Industrial Notes..... 379		Platinum..... 387	
		Quicksilver..... 387	
Machinery and Supplies Wanted..... 379		Other Metals..... 387	
Mining News. United States:	Markets.	Chemicals and Minerals:	Quotations:
Alaska..... 380	Coal:	New York..... 387	Boston..... 390
Alabama..... 380	New York..... 383		Ind. and Coal... 390
Arizona..... 380	Buffalo..... 384		Colo. Springs... 390
California..... 380	Pittsburg..... 384		New York..... 390
Colorado..... 380	Shanghai..... 384		Pittsburg..... 390
Idaho..... 381			St. Louis..... 390
Kansas..... 381	Metals:		San Francisco... 390
Michigan..... 381	Iron:		Baltimore..... 390
Minnesota..... 381	Pig Iron Production..... 384		Miscellaneous... 390
Missouri..... 382	New York..... 385		London..... 391
Montana..... 382	Buffalo..... 385		Paris..... 391
Nevada..... 382	Cleveland..... 385		Mexico..... 391
	Pittsburg..... 385		Valparaiso..... 391
	Philadelphia... 385		Shanghai..... 391
	Gold & Silver 386		Denver..... 391
			Philadelphia... 391
			Salt Lake City... 391
			Aspen..... 391
			Helena..... 391
			Duluth..... 391
			Mining Co's:
			List of..... 392
			Advt. Index 17
			Advt. Rates, 18

Good Mine Surveying.

The value of this can hardly be over-estimated and therefore it is impossible to pay too great attention to this branch of a mining engineer's education. In one case that came before our notice some years since, a very important litigation in Mexico was decided by a resurvey by competent engineers, who finally corroborated the original survey made more than 100 years previously, the litigation having arisen from incorrect surveys having been made in the interim. At this date we also happen to know of work being done underground in the anthracite region in one of the largest mines in Pennsylvania based largely on surveys made by a first-class engineer 29 years ago.

Increased Output of Copper in the United States.

The improved price of copper in this year as compared with the corresponding period in 1895 together with the resumption of activity in the manufacturing industries of Europe has had a very marked affect upon the production of the metal in the United States. We are entirely dependent upon Europe for the disposal of our surplus production, and naturally when the demand there is light, the price declines, as our capacity of production is far in excess of our home requirements. At present there is a good demand for copper both at home and abroad, and the price promises to remain firm during the summer.

The production in the United States for the first three months of this year amounted to 51,510 long tons, as against 38,567 tons in the corresponding period of last year, showing an increase of 13,943 tons, in other words about 33½ per cent. This increase has not been consumed, or any part of it, in this country, the consumption at home having remained stationary, or nearly so, thanks to our "mad" Congress. The exports, however, for the first quarter of the year were 27,356 long tons, as against 13,786 tons for the first quarter in the past year; an increase of 13,570 tons, or about 98½ per cent.

To show that this largely increased export was easily absorbed by the consumptive demand, it is only necessary to refer to the statistical figures of stocks in Europe and afloat, being on the first of April 39,950 tons, and on the first of January of this year 45,790 tons, showing a decrease of 5,840 tons which have gone into consumption.

The foreign production has remained practically stationary, being for the first quarter of 1895 20,840 long tons, and for the same period in 1896 20,900 tons. Therefore the improved price does not seem to have stimulated foreign production, but should the demand continue we have full confidence in the resources of our various copper producing districts to meet it.

Steel Production in the United States in 1895.

The production of open-hearth steel in the United States in 1895 is reported by the *Bulletin* of the American Iron and Steel Association at 1,137,182 gross tons, against 784,936 tons in 1894, showing an increase last year of 352,246 tons, or 44.9 per cent. In these figures are included all the open-hearth steel produced by the basic process, no separate report of the latter being made. The tonnage includes ingots and direct castings. The production of Bessemer steel for the year 1895 has already been reported at 4,909,128 gross tons.

The production by States or districts is reported as follows: Pennsylvania, 904,352 tons; Ohio, 75,637 tons; Illinois, 49,500 tons; New York and New Jersey, 32,203 tons; New England, 36,733 tons; other States, 38,757 tons. The largest proportionate gains last year were in Illinois and Ohio.

In 1895 open-hearth steel was made by 64 works in 11 States—New Hampshire, Massachusetts, New York, New Jersey, Pennsylvania, Kentucky, Ohio, Indiana, Illinois, Missouri and California.

The following table shows the production of Bessemer and open-hearth steel in the United States for five years past, with the proportion of each to the total:

	Bessemer.		Open-hearth.		Total
	Tons.	P. c.	Tons.	P. c.	Tons.
1895.....	4,909,128	81.2	1,137,182	18.8	6,046,310
1894.....	3,571,313	82.0	784,936	18.0	4,356,249
1893.....	3,215,066	81.3	737,890	18.7	3,953,956
1892.....	4,168,435	85.2	689,889	13.8	4,858,324
1891.....	3,247,417	84.8	579,753	15.2	3,827,170

In this statement we have not included the production of crucible steel and that of blister and puddle steel, which is not increasing. The total quantity of these varieties of steel made was 55,783 tons in 1894; 66,419 tons in 1893; 89,257 tons in 1892, and 77,070 tons in 1891. The total amount for 1895 is not yet reported, but was probably not over 60,000 tons.

It will be seen that the proportion of open-hearth steel increased up to 1893, and that since that year it has about held its own. It will doubtless increase in the future, as the number of open-hearth plants now under construction indicates. The total yearly capacity of the open-hearth plants in operation and under construction in January last was 2,430,450

long tons of steel, the increase during 1895 being 690,450 tons. The list of new plants built during 1895, including those under construction at the close of the year, shows a total of 62 furnaces, belonging to 27 companies. In fact nearly all the increase in our steel-making capacity during the year was in the open-hearth plants.

It may be noted also that more than half the new furnaces—34 in all—erected last year are basic furnaces. This shows that the basic process, heretofore somewhat neglected in this country, is now making rapid progress here, as its high degree of adaptability to iron from different ores and the excellence of the steel produced are more fully appreciated.

The African Gold Output and the World's Requirements.

The gold production of the world is increasing (amounting in 1895 to about \$200,000,000), but by no means as rapidly as the demand for gold, and in consequence, fine gold bullion commands a small premium above mint values in almost every part of the world though the mints are the chief consumers or absorbers of the metal and their price must control its value within narrow limits. Those who have been preaching the sufficiency of gold alone for the monetary needs of mankind have shown by their anxiety that they believe the supply inadequate, and have eagerly grasped at the figures of increasing output of the metal as proof that the world would soon have all it needs. South Africa and West Australia, and particularly the Transvaal and Rhodesia, have been represented as sources from which great rivers of gold would flow in vast volumes and forever. This comforting view of the case was, of course, encouraged by the promoters who were "booming" "Kaffirs," and consequently the opinion has spread over the face of the earth that the Transvaal mines can and will supply infinite amounts of gold, and that all anxiety concerning the sufficiency of our supply of the yellow metal is wholly groundless. We wish this were more near the truth than it is.

The Witwatersrand as a gold producer is undoubtedly a very remarkable mining district and it will certainly turn out a large amount of gold, but we venture the prediction that it will never realize the expectations of the boomers and that its yearly increase of gold production will be neither very large nor ever attain the magnificent figures that have been so generally expected. Two principal reasons lead to this belief: First, The amount of cheap labor obtainable is quite insufficient to very rapidly or largely increase the output of ore and, Second, The ore is becoming poorer as depth is attained and it is said that in "the deeps," as the lowest workings opened some months ago are called, its average yield has been but \$4 or \$5 a ton, a figure which, even with cheap labor, would scarcely pay, and which absolutely prohibits the use of expensive labor. Native labor, which at first cost \$6 per month, is now not to be had at \$10 a month, the highest price yet paid, as far as our information goes.

It is too early yet to say that no richer ore than this will be found in "the deeps," for they have not been sufficiently explored to justify this assertion. Neither is the heavy decline in output since July, 1895, to be taken as a permanent feature though it certainly was due only in part (in January especially) to political causes.

The average profit in 1894 has been calculated at \$2.67 per ton of ore, and while the cost of milling and mining has probably been reduced by the adoption of improved plant and by increasing production, still it would not take long at the past rate of decrease in grade, nor at the increasing rates of wages, to wipe out this favorable balance.

One difficulty has been interposed by the Portuguese Government in procuring native labor from their territory, which did not exist before. No native is now allowed to leave unless provided with a passport costing nearly \$5, and as the natives are not overburdened with this world's goods, are very unlikely to save that from their earnings in a few months' work, it is not probable, therefore, that any addition to the force of laborers will be obtained from the Portuguese territory. Every obstacle is thrown in the way even of having this passport paid for by the company requiring the labor, and it is officially stated that it is against the law of the Portuguese possessions to send away any natives, so that a new treaty will have to be negotiated between the Transvaal and the Portuguese Government to remove this difficulty. At present, however, the situation is that any emigration agent is liable to both fine and imprisonment.

The total number of natives employed directly and indirectly in the mining industry of the Rand was in the middle of March about 50,000, which number was insufficient for the work to be done. The wages that are paid has risen in a few years from the normal one of \$6 to \$16 a month, and what has been and is now a serious drawback to the companies operating, after they have supplied themselves with what they consider a certain number of laborers at a heavy outlay (in one case that has come beneath our notice of \$25,000), the uncertainty of its continuance for want of proper regulations and protection to the companies in the contract that had been made.

The figures of production before the labor trouble became so serious, contrasted with the production of recent months, show a very heavy falling off:

1895.	Oz.	1895.	Oz.
May.....	200,941	November.....	195,218
June.....	199,453	December.....	178,428
July.....	235,753	January, 1896.....	148,178
August.....	194,764	February.....	167,018
	798,731		688,842

The mines in the Transvaal are undergoing a hard experience, not the least of which is the excessive price charged for explosives, owing to the monopoly granted by the Boer Government. The cost to the Robinson Company for 1895 amounted to 3s. 3d. per ton on the whole amount milled, or about 16 per cent. of the total cost of mining and milling. This on so large a tonnage and under such economical and able management is an indication of the severe tax this item must be to some of the smaller concerns.

The annual accumulation of gold in Europe is very large; and it is drawn from all parts of the world, this country and Australasia, India and all other gold producing countries have sent their products there.

According to the London *Statist* Russia has decided not to attempt the announced resumption of specie payments for the present but it seems probable that there is an early expectation of doing so, else the accumulation of gold by that Government is on a very unusual scale for a war fund. The Bank of Russia holds nearly \$115,000,000 in gold above the amount it held one year ago, and including the addition made to the store in the Bank of England (\$46,000,000) and the Austrian State Bank (\$35,000,000) and allowing for a decrease in the French (\$27,000,000) and German State Banks (\$20,000,000) and allowing something for the gold used in the arts in Europe it appears that more than the entire world's production of gold in 1895 (\$200,000,000) was withdrawn from commercial circulation by Europe alone and there was consequently less gold available for this use at the end of the year of the world's greatest output that there was at its beginning.

If the United States should go on the silver basis, which would be inevitable were it to adopt, independently, free coinage, the result would be a private hoarding of gold which would doubtless withdraw from commercial use in one year more gold than the whole world produces in the same time. The balance of our gold would in part go to swell the "war chests" of European countries, and the remainder would help to supply the needs of their commerce, and would thus postpone still further the adoption of real bimetalism. There would be no increase in the available stock of commercial gold, and this country would have sacrificed itself and retarded the end free silver men claim to have at heart.

Gold Production in Australasia.

The production of gold in New South Wales has recently been ascertained and announced by the Mining Department, and that bureau has also received the figures for all the other colonies of Australasia. The figures, as published in the Australian papers, are given in the following table, and show that gold mining there, as in all parts of the world, has been carried on with increasing activity and generally greater results.

GOLD PRODUCTION OF AUSTRALASIA.

	1894.		1895.		Changes.		
	Reported Ounces.	Fine Ounces.	Reported Ounces.	Fine Ounces.	Reported Ounces.	Fine Ounces.	Per ct.
Victoria.....	673,680	633,259	740,086	695,691	I. 66,406	62,422	9.9
Queensland.....	679,511	567,587	623,400	513,975	D. 56,511	46,622	8.3
New So. Wales..	324,787	284,189	360,165	315,144	I. 35,378	30,955	10.9
New Zealand....	221,533	199,380	293,491	204,142	I. 71,358	64,762	32.5
West Australia..	27,131	168,812	231,513	185,683	I. 24,382	19,871	11.8
Tasmania.....	57,873	51,907	54,964	48,918	D. 2,969	2,589	5.0
South Australia.	35,844	33,156	47,343	43,792	D. 11,499	10,636	32.1
Total.....	2,200,359	1,930,900	2,350,562	2,070,335	I. 150,203	139,435	6.9
Total Kilos.....		60,059		64,396	I.	4,337	6.9
Total Values.....		\$39,911,703		\$42,793,824	I.	\$2,882,121	6.9

In calculating the fine ounces in this table the gold reported has been taken at the actual values given in the official reports and in the Mineral Industry. Total value of the production in 1895 was \$42,793,824 against \$39,911,703 in 1894, showing an increase last year of \$2,882,121. This total was about \$4,036,876 below the United States output in 1895.

Victoria continues to lead the Australasian colonies as a gold producer, and in 1895 showed a moderate increase, 9.9 per cent. in its output. Considering the drought from which the colony suffered, like all its neighbors, this is a favorable result. The production is very nearly one-third of the total and more than twice that of any other colony except Queensland.

Queensland showed last year a decrease of 8.3 per cent. in its gold production, which seems to have come from a reduction in a few of the principal mines and the absence of new discoveries. Some of the loss also is to be attributed to the financial depression prevailing, which has prevented the undertaking of new work, and to the extremely dry year from which the colony suffered.

The production in New South Wales shows a rate of increase of 10.9 per cent. It could hardly be expected that the phenomenal rate of gain made in 1894 could be kept up, and the advance secured last year is as great as could be expected. The increase in 1894 was very largely

from alluvial workings, the labor conditions in the colony having driven a great number of men—many of them old miners—from the towns and cities to prospect for new placers and to work in old ones, abandoned when more profitable employment was offered in manufacturing, in building and other trades. This movement back to the gold-fields was aided by the government and was carried so far in 1894 that comparatively little increase was to be looked for last year. The gain seems to have been about evenly divided between placer workings and deep mining.

The gold production of New South Wales for ten years past has been as follows :

Year.	Reported. Ounces.	Fine Gold. Ounces.	Year.	Reported. Ounces.	Fine Gold. Ounces.
1886.....	101,417	88,740	1891.....	153,356	134,169
1887.....	110,288	96,502	1892.....	156,870	137,261
1888.....	87,503	76,565	1893.....	179,288	156,877
1889.....	119,759	104,789	1894.....	324,787	284,189
1890.....	127,760	111,790	1895.....	390,165	315,188

The total production of gold in New South Wales since the discovery of the gold-fields has been 11,394,563 ounces, equal to 9,970,242 fine ounces, having a total value of \$206,084,900. It will be seen that the production in 1895 was more than double that of 1893, and considerably over four times that of 1888.

New Zealand shows the effect of the new work started in the Hauraki and other districts in an increase of 32.5 per cent. in its gold output, and the present indications are that the gain will continue. It is a notable one because very little of it is due to new discoveries; it has come mainly from the development of old mines and districts, and from the adoption of improved processes for working ores formerly considered too refractory to pay. There are indications of a coming "boom" in New Zealand mines; but it is to be hoped that it will be a moderate one, and will not approach the extent of that in West Australian mines, which is now beginning to collapse. This colony has a better climate than any of the other Australian States, and the conditions of mining in the supply of fuel and other necessities are very favorable. Above all it has an abundant supply of water, the lack of which is so serious a drawback on the Australian Continent.

If we consider only the difficulties attending work in the gold-fields of West Australia, which were last year increased by a season unusually dry even for that country, its increase of 11.8 per cent. would be satisfactory. But if we take into account the excitement caused by its mines, the large number of men who have gone into them and the enormous amount of capital which has been invested there, the result appears an extremely disappointing one. Almost as much has been said of West Australia as of the Transvaal, and a very great number of companies have been floated on the strength of its supposed riches; and yet the total production of the colony in 1895 was but little more than one month's output of the Witwatersrand. Some improvement is possible this year, since the railroad has reached Coolgardie, the chief mining center, and the introduction of machinery is thus made possible, and supplies will be cheapened; but it is manifest that the country has been overrated from the first, and the prospect for shareholders in the very large majority of the companies is not encouraging.

Tasmania showed a decrease of 5 per cent. from 1894. This should not be taken as an indication that the gold mines of the island are becoming exhausted. The decrease was due in part to difficulties attending exploration and prospecting, and in part, probably, to the diversion of labor to the copper and tin mines in which work was conducted last year on a greater scale than ever before.

Very little has been heard of South Australia recently its reputation having been overshadowed by that of its western neighbor. Nevertheless the increase, while not so large in actual amount was proportionally greater than that of the other colonies except New Zealand. The gain, as compared with 1894, was nearly one-third, and the colony has attained a very respectable rank as a gold producer.

BOOKS RECEIVED.

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.

Societe d'Encouragement pour l'Industrie Nationale; Annuaire pour l'Annee, 1896. Paris, France; Chamerot et Renouard. Pages, 166.

Annual Report of the Bureau of Industrial Statistics of Pennsylvania for the Year 1894. Harrisburg, Pa.; State Printers. Pages 740; with map and illustrations.

Chemistry at a Glance: A Study in Molecular Architecture. Part I; Oxides. By Herbert B. Tuttle. New York; J. J. Little & Co. Pages, 59; with chart and diagrams.

Report on the Affairs, Progress and Development of the Territory of Arizona for the fiscal year ending June 30, 1895. By the Governor. Washington, D. C.; Government Printing Office. Pages, 113; with map and illustrations.

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.

Mountain Transportation of Heavy Stamp-Mill.

The copy of your valuable paper for February 22d has just reached me, and I have read it with much interest and profit, as I always do. The article on "Mountain Transportation of Heavy Stamp-Mill," with its admirable illustrations, presents in graphic form some of the constantly recurring difficulties which are daily being successfully solved by the fertile brains of those engaged in our great industry. I beg to observe, however, that the method of transporting wire rope, as described and illustrated in the above mentioned article, is not a new one. It has been used by at least one mining company in Central America for some years past for the transportation of wire rope for cable tramways. I presume it has also been adopted in other countries where wagon transportation is impossible.

H. H. MILLER.

YUSCARAN, Honduras, C. A., March 25.

Rand Labor Question.

Sir: At the Rand things will take rather a long time to get into complete working order again. The most serious element of difficulty is the disorganized labor market. This evil, which is worse and more refractory, if I mistake not, than anything in the political situation, was beginning to be felt long before the recent revolt. The demand is ever increasing, faster, in fact, than the means of supply. Twenty-five thousand natives would be none too many to make up the full required personnel of the gold mines of the Transvaal and, unless intended expansions of enterprise are checked, as many more will be needed during the next two years. Whence are they to be supplied? Present resources seem pretty nearly taxed to the utmost and legislation will avail nothing in this matter. The fact is the Rand mines are face to face with a gigantic difficulty. Robinson, Randfontein, the Treasury and others completely shut down (the mills) for development, which got behind for want of mine laborers, is a very unpleasant fact; and thus many other mines, most of the larger ones, in fact, have suffered and are still suffering in their developments. The statements at the annual and half yearly meetings reveal this and the returns begin to show it.

The "deeps" are still an unsolved problem, that is, the possibility of working them at a profit. Real and serious difficulties have been ignored or kept out of sight. There has been an indulgence in an immensity of bounce and twaddle. More about this anon. Five thousand feet of mining and only a 12s. per ton margin to start with, with water and other difficulties to cope with, not felt for the present, is not cheerful for the stockholder, however it may be for the well-paid engineer and the manipulator of stocks. Johannesburg is no bonanza mining city.

Electric transmission of power makes some progress in this country; there are three mills running on the Moodie property (Barberton) alone. The scheme for the distribution of power from the Boksberg collieries to the Rand gold mines will be the largest thing of the kind in mining here or anywhere. It is to be hoped the waste of power there may not be so great as they say it is at Barberton. Electricians seem yet unable to do things in the same positive and reliable manner that we are accustomed to when dealing with steam and water. Their shortcomings and bunglings at Barberton have given infinite trouble and expense. Electric power is, the writer thinks, the only remedy for the threatened abortion of the Rhodesia gold mining enterprise, as it has been recognized to be in Westralia.

PENTON.

PILGRIMS' REST, March 3d, 1896.

Gold Mining in the South.

Sir: Mr. Caracristi's strictures upon the gold mining boom in the Southern States, which appeared in the *Engineering and Mining Journal* of March 28, appears to partake of the nature of an attack, and, as such, should not pass unchallenged. If Mr. Caracristi had contented himself with the mere sounding of a note of warning against the wiles of unprincipled promoters, he would have done an undoubted service to the South. But it is going too far to say that, "as it is, they (the southern gold-fields) are worthless and will waste the money of all investors in them." Mr. Caracristi must be aware that profitable gold mines are being operated in the South to-day, the Haile Gold Mine, under Mr. Adolph Thies' able management, being a conspicuous example. My own experience has been very wide in the lower Appalachian and Piedmont gold belts, and while I have condemned more properties than I have ever commended to capitalists, I have nevertheless been able in many cases to render very decidedly favorable reports. These Southern mines are almost without exception what are commonly termed "low grade propositions." The oxidized ground is shallow, and the sulphide ores below water level in the more favorable cases will assay only from 6 to 12 dwts. of gold to the ton. The veins are rarely wide, but they frequently average from 4 to 6 ft. On the other hand fuel, timber, waterpower, and labor are all abundant and cheap. There is no possible doubt that there are many mines in the South to-day which can be made profitable if wisely worked. Also there are many small properties, too small to pay for any but the simplest mining and concentration plants, which could be worked by local capitalists at a good profit, if custom works for the reduction of the concentrates were established at convenient points in the gold belts.

It is unfortunate that a "boom" should have developed with these Southern gold mines as a basis. This means that the professional "boomer" will entrap many an unwary capitalist, and end by throwing discredit upon legitimate propositions. But the promoter is not peculiar to Southern gold regions, and he will continue there and elsewhere to beguile the man of means itching to humor his gambling spirit by a "flyer" in a mining venture, until "flyers" and those who indulge in them are classified where they belong—with racing and betting and racers and betters. Then the world may learn that mining is not a game of chance, but that it depends for success upon knowledge and good management. The trouble is not so much with the Southern mines as it is with human nature.

COURTENAY DE KALB.

UNIVERSITY OF MISSOURI, ROLLA, MO., SCHOOL OF MINES, April 2, 1896.

Our Gold Producing Resources.

Sir: Many people do not realize that the United States is the richest gold-field in the world. It will surprise those who have not followed statistics to learn that California has produced about \$1,200,000,000 in gold since 1849, an average of about \$26,000,000 per year for a period of 47 years. Her production at one time reached about \$33,000,000 per year. At present hydraulic mining is greatly curtailed in consequence of the Anti-Debris law. The production last year was about \$15,000,000, largely by the quartz mines. There are many quartz ledges in California that have only been prospected; they are known to be equally as promising as any that are now worked, but remain idle, simply awaiting the development which capital alone can make possible. It is the judgment of the prospectors, the men who are perhaps the most familiar with the auriferous ledge of California, that Sierra County alone could supply 1,000 stamps. This would mean an output of about \$3,500,000 per year on \$6.00 quartz. Sierra County has produced over \$60,000,000 from her gravel beds and river placers. The most of the quartz ledges, the feeders of these gravel beds and placers, are still in their primitive state, a standing invitation to capital and enterprise.

These properties require development and equipment, neither of which has been possible in view of the difficulties in obtaining capital for mining enterprises.

The experience of the public, especially the Eastern public, has, as a rule, been unfortunate in mining investments. Were it not for this fact, which is freely admitted, we could not explain the strange anomaly that keen, shrewd, far-seeing men of the Eastern States, usually ever ready to grasp opportunities for money making in any safe, legitimate, promising industry, as a rule the most successful of business men, should practically shun the most legitimate of all industries, the one industry which more than any other adds to the nation's wealth, and which is essential to the prosperity of every nation, namely, gold mining. The antipathy against investment in mining, that has prevailed among Eastern investors to the detriment of legitimate mining, for the past 20 years, but which fortunately is now yielding to a more enlightened view of the question, as a result probably of the improved methods and great progress in the system of mining operations, and the evident need of a larger gold supply, is due and tractable to the fact that while mining was yet an infant industry, without experience and largely experimental, conducted in a crude and expensive manner, many companies, formed and controlled by Eastern men, proved financial failures with great pecuniary loss to those who invested in them. Since those days of wild excitement and reckless investment, the mining industry has had 20 years of progress, and to-day the situation is entirely changed.

The immense fortunes that have been made by those who have persistently engaged in mining, the output of millions of dollars, year after year, by the various mining States, the large returns on capital actually invested in mining have appealed with but little success to the Eastern investor. He has persistently stood aloof—remembering only the experiences of the early days, forgetful of and oblivious to the fact that mining as a speculation twenty years ago should be distinguished from mining as an industrial investment at the present time. Within three years a new gold district has been discovered in the State of Colorado producing in this brief space of time over \$20,000,000.

In the States of California, Oregon, Montana, Idaho, and other states there are known to be mineral deposits equally as inviting. It is well known to mining engineers that the United States includes in its wonderful natural resources an inestimable area of the richest gold lands and ledges awaiting development and which promise large returns to capital.

It should be impressed on the public mind that during the past 20 years the mining industry has made marvelous advancements, against obstacles that would have been insuperable and probably fatal to any other industry. This advancement has been in a scientific sense, and a most salutary feature is the reduction of the methods employed to a system that pays due regard to the question of economics. Mining has been reduced to a science. It is no longer an experiment. Twenty years ago the average saving of gold by the best methods then known was about 50%. The cost of mining was double that of the present time. To-day the average saving of gold in milling and by the wet process is from 80% to 85%.

We now save 95% of the sulphurets and treat the concentrates at a cost varying from \$8 to \$18 per ton. We simply have learned the business, and to-day mining is conducted as an industry with very little of the element of speculation in it. Mining schools have been established, mining engineering has been taught in many of our best universities, and graduates have found opportunities at the mines to further enlarge their knowledge of the practical requirements of their profession. Twenty years ago, notwithstanding the adverse conditions for the safe and profitable employment of capital in mining operations, mining ventures were in great favor, in fact, surfeited with public confidence and capital. Such investments at that time should have been made with great caution and trepidation in view of the fact that mining was then little understood, largely speculative in its character, lacking in the most essential requirements, namely, experience and facilities for economical operations.

A great many problems have had to be worked out and the factor of time alone would make this possible. No industry of the present day is better equipped with the elements of success; properly carried on no industry is so free from the elements of uncertainty; no business has such absolute immunity from the adverse conditions of trade and no industry includes so large a percentage of bright, practical men, men thoroughly skilled in their profession, as the mining industry.

We have the testimony of men who are certainly competent to advise, whose statements are not susceptible of suspicion or disproof because they do know from evidences that have substantial support that the United States is capable of producing double the amount of its present output of gold and of maintaining that output for many years; that the gold-fields of this country, *now idle*, either for want of development or equipment, or both, are equally as rich as those from which the country is now deriving its annual supply of less than \$50,000,000. We have this resource: the gold deposits, together with many natural advantages, particularly water power, timber, fuel, and favorable geographical situations. We have machinery adapted to the purpose and all required facilities at our command; we have the experience of many years, the knowledge and skill of engineers, mineralogists, chemists and experts in

all the departments of mining and reduction of ores; indeed, every element and factor essential to success is now available for the development, equipment and working of our gold resources, which await only the co-operation of capital.

The discovery of gold in 1849 was a potent stimulus to the development of all other resources in this country and our material prosperity has been sustained, in no small measure, by the constant annual output of gold. If business men and investors would study this mining question as a business proposition they would see that there is to-day a better opportunity to make money in gold mining than ever before, and that the swelling of our annual gold output would stimulate all other industries, furnish employment to thousands of our (now) unemployed labor, and last but not least, it would certainly go far to establish beyond doubt confidence in the ability of our government to redeem all its obligations in gold.

While it is so desirable to rehabilitate the mining industry in the public confidence, it is equally to be desired that what is called a "boom" may be avoided. In this respect, however, we may observe that the days of wild-cat mining schemes are over for all who will avail themselves of the opportunities for investigation.

JOHN H. PIPER.

ABSTRACTS OF OFFICIAL REPORTS.

Pennsylvania Steel Company.

The report of the Pennsylvania Steel Company covering the business of the year 1895, to be submitted to the stockholders at the annual meeting May 4, shows that the gross sales at the Steelton works amounted to \$6,679,956, leaving a net profit of \$452,989. Of this, \$295,393 was paid for interest, and \$35,987 for legal and reorganization expenses, leaving a surplus of \$121,657. During last year the Bessemer plant was remodelled and improvements made to the bridge and construction department at a cost of \$113,468, all of which was paid for out of the profits. The gross profits of the Maryland plant were \$242,961, and the expenditures for interest, reorganization expenses, and cost of improving furnaces were \$278,882, causing a deficiency of \$35,920. Last year, the report adds, was not a phenomenally good one for the iron trade, but the dividend on the preferred stock was more than earned. The property of the company is said to be in a better condition than ever before, and the capacity greatly increased. Concerning the future, the following statement is found in the report:

"Inasmuch as the company starts with a new capitalization of both stock and bonds, and the expenses of the year 1895 were increased by the necessary charges incident to reorganization and settlement of the debts of the old company, it is difficult to compare results with those of former years; but it is expected that even should the condition of the trade not improve during 1896, the income of your company will be sufficient to provide for all its interest charges and leave a substantial surplus."

THE NICKEL-PLATING OF WOOD.*

The articles to be nickel-plated must first of all be coated with metal; for this purpose the following three solutions are employed: I.—1½ grms. of caoutchouc slicings are dissolved in 10 grms. of carbon bisulphide, and 4 grms. of melted wax are poured into the solution. A mixture which has been prepared beforehand, consisting of 5 grms. of phosphorus in 60 grms. carbon bisulphide, with 5 grms. turpentine and 4 grms. of powdered asphalt, is then added, and the whole shaken. II.—2 grms. of silver nitrate are dissolved in 600 grms. of water. III.—10 grms. of chloride of gold are dissolved in 600 grms. of water. The conducting wires are attached to the article, which, after being immersed in the first solution, is allowed to dry. The second solution is poured over it, and it is kept suspended until the surface has a dark luster, when it is rinsed with water and treated in a similar manner with the third solution. The surface has now a yellowish sheen, and the wood is sufficiently prepared for electrolytic deposition.

Langbein's dry process consists in quickly pouring over the article a collodion solution of potassium iodide, diluted with an equal volume of ether-alcohol; when the layer is just about to set the wood is laid in a weak solution of silver nitrate, light being excluded. As soon as a yellow color appears the wood is rinsed, exposed to sunlight and covered with copper, prior to being nickel-plated.

Wooden handles for surgical instruments may be treated by immersion in an ethereal solution of paraffin or wax, and when the ether has evaporated fine graphite is powdered over them, or the wax is covered with bronze powder and all unevenness of surface removed. When the articles are to be electrolytically coated with copper they are placed in a bath, the composition of which varies with the current employed; generally consists of 30 litres of 18% copper sulphate solution and 1½ litres of 66% sulphuric acid. When a sufficient amount of copper is deposited the articles are ground, polished and nickel-plated in a bath composed of 500 grms. of ammonium nickelous sulphate, 50 grms. of ammonium sulphate and 10 litres distilled water. If blue litmus paper be quickly reddened by this solution the acidity is reduced to such a point by addition of ammonium chloride that the reddening is only slowly developed.

Increase in Electric Traction in England.—A marked increase in interest and investment in electric enterprises in England is shown by parliamentary returns. There are now before Parliament 30 electric lighting provisional order bills, involving an estimated capital of a million and a quarter sterling. There are 22 bills relating to the construction of 103 miles of tramways at a cost of considerably over two millions sterling, and in regard to more than half of these schemes it is proposed to employ electric traction. In addition 15 tramway provisional orders have been applied for, and in nine of these electric traction is specifically mentioned.

* JI. Soc. Chem. Ind., from Dingler's Polyt. Journal.

BLACK HILLS, SOUTH DAKOTA.

The Homestake mines are situated at Lead, South Dakota, about three miles west of Deadwood, in what is known as the Black Hills District, and are reached by the Chicago & Missouri River Railroad and the Fremont, Elkhorn & Missouri Valley Railroad.

The company, known as the Homestake Mining Company, has a capital stock of \$12,500,000, par value of which is \$100 per share; number of shares, 125,000; total amount of assessments levied, \$200,000, and the last assessment was made July, 1878, of \$1 per share. They have paid in dividends \$5,837,500, and the last monthly dividend was paid in April, 1896, amounting to 25c. per share. Including the Highland and the Deadwood Terra mines, which are all included in the Homestake properties, more than \$10,000,000 in dividends have been paid.

The gold is carried in quartz rock, which runs a little less than \$4 per ton. When this vein was first discovered it was worked as an open pit mine, and some open pit work is carried on there still. Their underground work is about 800 to 1,000 feet below the surface, and they have sufficient openings to insure work for 10 years to come.

The Highland Mine is one of the properties operated by this company, and until 1893 both the Homestake and Highland Mines were worked by the old system of hammers and drills. The Highland Mine has now installed a Half Duplex Corliss Air Compressor, manufactured by the Ingersoll-Sergeant Drill Company of New York City, size of which is: Steam Cylinder 20 in. in diameter; Air Cylinder 22½ in. in diameter; stroke 42 in.; carrying steam at about 100 to 110 lbs., and working 16 drills 3 in. diameter.

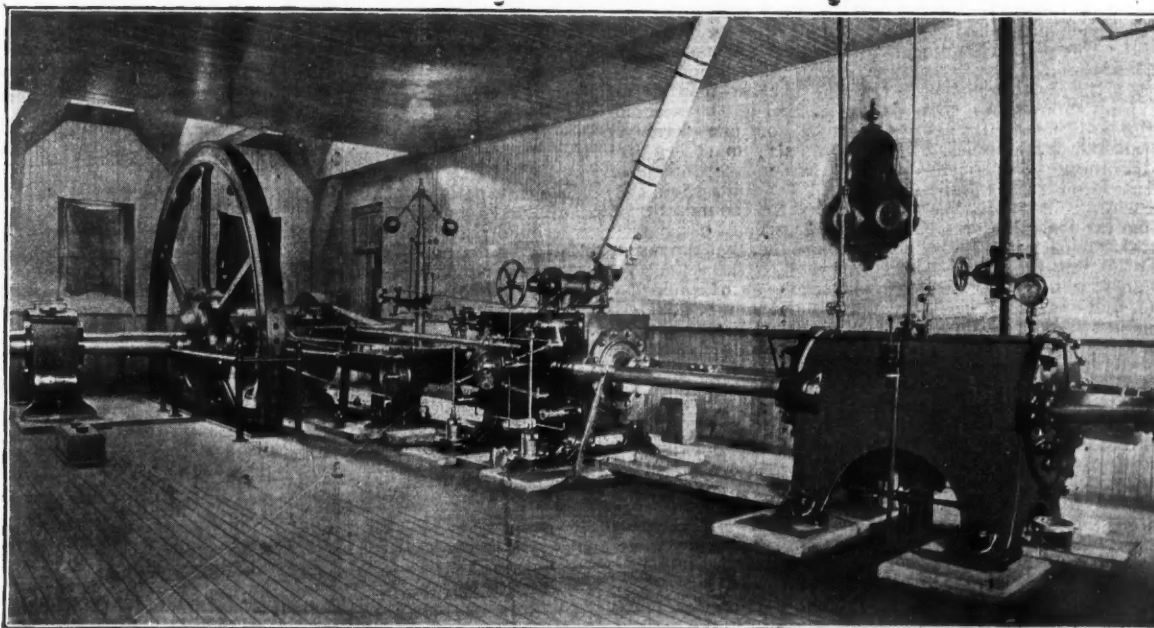
In 1894 the Homestake Mine installed an Ingersoll-Sergeant Duplex Corliss Air Compressor, size, steam cylinders 24 in. in diameter; air cylinders, 26½ in. in diameter; stroke, 60 in., and 35 3-in. mining drills. By the installation of these plants the Homestake Company were enabled to about quadruple their product for the same amount of outlay for labor. The rock is very hard, and it sometimes took, under the old-fashioned system of hammers and drills, three men a shift of eight hours to put in a 6 to 8-ft. hole. With compressors and drills one man and a helper can put in from 35 to 50 lineal feet of holes in the hardest quartz

A HYPOTHETICAL NEW HYDRAULIC CEMENT.

Written for the Engineering and Mining Journal by A. D. Elbers.

The term "hydraulic," as applied to mortars and cements, means that such masses continue to harden under water after they have set. Their "setting" may require half an hour, several hours or even a whole day, according to the nature of the compositions, but the hardening under water is apt to continue with all of them for years. Hydraulic mortars are mixtures, the essential constituents of which are lime, siliceous substances on which dissolving lime can react chemically, and water; and hydraulic cements are either natural or artificial compounds of siliceous substances and lime, which have been burned to the sintering point, and which are used without admixture of lime. The setting of hydraulic mortars is due to incipient reactions that take place between dissolving lime and soluble siliceous matter. Though the quantity of the new matter that is formed by such reactions is at first of rather infinitesimal proportions, it is capable of bonding the mass in which it forms. When such masses are allowed to dry completely then they do not become much harder—and sometimes not as hard—as ordinary air-mortars. Hence it is said that hydraulic mortars set rather indifferently. Hydraulic cements set very energetically, because their particles—or at least a great portion of them—hydrate when they come in contact with water. Their setting may—in that respect—be compared with that of plaster-of-Paris, but with just this difference: the particles of a mass of plaster-of-Paris all hydrate inside of a few minutes and increase in volume while they are hydrating; hence, their cohesive attraction becomes partly neutralized by their expansion; the cement particles, on the other hand, do not expand sensibly, and hydrate gradually, not completely at once nor all at the same time; hence it may be said that their mass solidifies actually on account of the cohesive attraction of its hydrating particles. That this action continues, long after the mass has set, is evident from the fact that hydraulic cements take up over three times as much water, within three days after having set, than they combine with while they are setting.

The setting of hydraulic mortars is, therefore, due to influences that



HALF DUPLEX CORLISS AIR COMPRESSOR.

in a shift, or day's work of eight hours. They are running at the mine about 600 stamps to crush the rock. The gold is free-milling, and, as previously stated, runs a little less than \$4 per ton. They are now sinking another shaft about one-half mile east of their "Uncle Abe" shaft, and when completed will add a new stamp mill and other machinery.

Previous to the introduction of air compressors and drills the stock of this company sold on the market at about \$12 per share, and they paid a monthly dividend of 15c. Since the installation of machinery they paid a monthly dividend of 25c. per share, and the latest quotation on the stock in the New York market was \$29 per share.

Recently an air pipe line has been extended underground to the Deadwood Terra property, a distance from the Homestake compressor plant of nearly two miles, and compressed air is carried this distance and six additional drills operated at the Deadwood Terra mines. The total number of drills now in operation in the Homestake group of mines is 63.

The Black Hills District, although one of the oldest mining camps known, has recently, without a boom, been very active. In this district are situated the Golden Reward, the Deadwood & Delaware, Columbus, Gold-n-Crown and numerous other mines, besides innumerable "prospects," which have not yet arrived at the stage at which they may be dignified by the name of mines. In this district, also, there is the Deadwood & Delaware Smelter, a chlorination plant and a cyanide plant for the reduction of refractory ores. There is a new chlorination plant now being built at Pluma, about two miles from Deadwood, capacity about 200 stamps. About 80 miles south of this district is situated the "Holy Terror," which, when discovered a short time ago, created much excitement. This mine is adjacent to the Keystone and several explorations. These mines are but a short distance from Harney's Peak, which at one time commanded much attention on account of the tin which was discovered there, but not in sufficient paying quantities.

are entirely different from those that effect the setting of hydraulic cements. The subsequent induration under water, of either materials, is, however, due to the same—or at least to very similar—influences, as will become more apparent from the following consideration of the chemical behavior of those constituents to the reactions of which the ultimate induration of all such masses has to be ascribed, viz., silica and lime.

Crystalline as well as amorphous silica are entirely insoluble in either cold or hot water; but amorphous silica yields sparingly silicic acid, in aqueous solution, to boiling water that is under strong pressure. This change involves an absorption of heat energy amounting to 11.8 calories (per gram molecule of SiO_2) whereas the heat that becomes latent when water evaporates at 100°C ., amounts only to 9.65 calories. Hence it follows, that the pressure of the boiling water must be raised to about 60 lbs. to the square inch before the amorphous silica can begin to combine with water, and also, that silicic acid (gelatinous silica) dries quickly when exposed to the air.

Calcium hydrate, on the other hand, dissolves under evolution of heat; but as its heat of solution amounts at ordinary temperature (15°C .) only to 3.1 calories, whereas the dissolution of amorphous silica requires a much larger amount, it is evident that dissolving lime can only react on a morphous silica because the resulting compounds supply the difference. There are no current data on the thermal values of such compounds; but the known thermal results of reactions, between dissolved sodium hydrate and silicic acid, and the known reactions between dissolved sodium silicates and calcium hydrate, make it evident that hydrated silicates of lime can form when dissolving lime is in contact with amorphous silica, and also, when it is in contact with soluble alkaline silicates. The exact constitution of the silicates of lime that are thus formed in mortars and cements is not known, but it is probable that most of them are at first in a gelatinous state; hence they are apt to lose water—or even to split up

into calcium hydrate and amorphous silica, when the mass that contains them dries completely; but when such a mass is under water then they become gradually crystallized, and the mass is then apt to indurate as long as this process of crystallization goes on. Hydraulic lime (which consists of calcined siliceous limestone) as well as some volcanic earths that make excellent hydraulic mortars, owe their efficiency chiefly to their contents of amorphous silica; other volcanic earths owe their efficiency chiefly to their contents of soluble alkaline silicates; and hydraulic cements contain soluble alkaline silicates, amorphous silica (sand or crystalline silica that has been rendered amorphous by the burning) and (aside from the free lime or unreduced carbonate of Roman cements) lime that becomes free while the cements are hydrating. It is, therefore, evident that the hardening under water, of hydraulic mortars and hydraulic cements, is in most cases due to identical influences, as was claimed in the beginning of this article.

There is, however, one peculiar feature of combination that requires especial consideration. It is known that mortars made from lime and certain kinds of blast furnace slag that are readily decomposed by sulphuric acid become as hard under water—within a limited period—as the hydraulic mortars above referred to; they are, however, not so reliable in regard to their ultimate endurance, on account of the soluble sulphides which such slag contains. The kinds referred to are of singulo to sesqui-silicate constitution. They contain so little of alkalis—in some cases mere traces—that dissolving lime cannot be supposed to affect them to any appreciable extent on account of these contents; their efficiency must, therefore, be accounted for in some other way. It is scarcely necessary to say that the silicates of lime and alumina of which such slag chiefly consists, cannot even become chemically affected by the heat that is set free by hydrating lime, which amounts to 15 calories per gram-molecule of CaO; but these silicates are also combined with ferrous silicates that change to amorphous silica and ferric hydrate by decomposing water, and this process of decomposition is, of course, accelerated by the heat that is evolved by dissolving lime, and still more by the heat that is evolved by hydrating lime. Moreover, the slag itself is apt to contain appreciable quantities of amorphous silica when it has been granulated (which is always done when it is to be used for the composition of mortars), and for the following reason: As long as the molten slag is in the furnace it is apt to undergo rapid molecular rearrangements, hence, some of its silica must be constantly on the move or changing places; and when the flushed slag is cooled suddenly—either by quenching it in water or in any other way—then this silica remains amorphous, because it has not sufficient time to get rid of the heat that it must evolve (viz.: 8.1 calories) before it can change to the crystallized state. But this change does set in when the flushed slag is allowed to cool gradually, and as the specific gravity of crystalline silica exceeds that of the amorphous considerably, over 10 per cent., it follows, that the slowly cooling slag must acquire greater density than the slag that is cooled quickly, which accounts also for the fact that the latter is more easily decomposed by acids than the former. From the foregoing it will become apparent that the indurating capacity of slag mortar depends almost entirely on the amount of gelatinous silica that its slag particles yield to the dissolving lime, that the latter can only react on the slag particles superficially and to the extent to which they expose soluble parts, and that the efficiency of each slag particle is therefore, in a measure, inversely proportional to its size.

The conclusions just arrived at apply not only to slag-mortar, but to all hydraulic mortars and—in a measure—also to all hydraulic cements, including the new hydraulic cement, which, as many a reader may have suspected by this time, is to be evolved from blast-furnace slag.

It is well known that certain kinds of blast-furnace slag, of "sub" or barely "singulo," silicate constitution, crumble or fall to powder either in cooling or shortly after they have cooled, that such "slacking cinder" (as it is called by the furnacemen) sets, when mixed with water, somewhat in the manner of hydraulic cements, but that it does not set with sufficient force to be available as a cement. As such slag is usually also still more sulphurous than the less basic kinds that have been referred to previously, its use for hydraulic mortar is entirely out of the question; but there is scarcely any doubt that it would set with much more energy if it were desulphurized in the molten state and if it were then cooled rapidly, either by air-chilling or by casting it in thin layers on thick plates of wrought iron or low-carbon steel.

That slag of this description can be desulphurized in its molten state, and that it can be desulphurized, chilled and ground for less money than it costs to merely provide and manipulate the raw materials for Portland cement, not counting the subsequent burning and the grinding of the burned stock, the writer is convinced of. Taking that point for granted, it remains to be shown why slag that has been subjected to the proposed treatment can be expected to possess inherent hydraulic properties of sufficient merit to come into general use; and as Portland cement is also an entirely artificial product, the inferences that can be drawn from its behavior are apt to throw much light on this question.

It is said that the burned stock of Portland cement falls apart or "slacks" when its composition does not contain enough of lime, or to put it in another way, when it is too aluminous. Blast furnace slag, on the other hand, is said to slack when it contains too much of lime. Hence the fact that slacking Portland stock makes cement of a poor quality does not imply that slacking blast furnace cinder should not make good cement. Then, again, Portland cement "blows" in setting when its composition is too limy. The slacking as well as the blowing can, however, be easily accounted for. In order to convert clay and lime into cement that will have the property of hydrating in the manner hereinbefore described, their mixtures have to be subjected to intense heat. The hydrating capacity of the resulting compounds depends on a certain state of incipient combination, and in order to bring that state about the mixtures must be heated to a certain temperature, whatever the relative proportion of the respective constituents may be. When the proportion of the lime is small then the progress of combination is apt to be so rapid that a considerable portion of compounds, that have already become sufficiently fritted, are apt to vitrify completely before the intensity of the fire abates. Thus the ferric oxide of already formed calcium ferrate may recombine with the silica of already formed silicates of lime to silicates of iron, which have not the property of hydrating. The slacking of such overburned masses may, therefore, be solely due to the falling apart of fritted, and of completely vitrified, particles, the one kind contracting more in cooling than the other. The particles of slacking cinder, on the

other hand, have all been completely melted; hence, their falling apart must be due to the splitting up of compounds that are not stable at ordinary temperature. Returning to the Portland compositions, it is evident that their overburning can be prevented by increasing the proportion of the lime, inasmuch as the refractoriness of the mixtures increases with their basicity, always provided that the respective basic constituents are highly refractory. But when there is too much lime, then a portion of it is apt to combine so loosely that it can slake almost as rapidly as calcined lime that is not combined at all, and then the cement "blows." Thus a fritted particle consisting of: $3 \text{ CaO}, \text{SiO}_2$, may readily yield one molecule of CaO as soon as it comes in contact with water; in other words, it is to be supposed that the heat, that is set free when a molecule of singulo silicate of lime combines, for instance, with one additional molecule of lime, ($2\text{CaO}, \text{SiO}_2 + \text{CaO} = 3\text{CaO}, \text{SiO}_2$) amounts to somewhat less than that which this third molecule of lime sets free by hydrating; but when such sub-silicates have been completely melted—as in the case of blast furnace slag—then they are apt to hydrate gradually, even after they have become split up. It may also be inferred from these illustrations that the sulphides of basic slag must obstruct such possible changes considerably.

The masses, that can form from Portland stock when it is melted completely, are not apt to either slack or split up, because their large contents of easily fusible silicates of iron and silicates of the alkalis would counteract any such tendency; whereas basic blast furnace slag must have that tendency because it is nearly free from combined iron as well as from alkalis.

Finally, it may be mentioned that standard text-books on the manufacture of cements contain a good deal of information about the way in which clay and lime are supposed to become changed to silicates and aluminates of lime, about the falling apart of such compounds when in contact with water, about the subsequent recombinations of the respective constituents, etc., much of which the writer has never been able to understand fully. Some of the best authors admit, however, that the compounds, that are formed by the aqueous combination of alumina and lime, are not stable, and that ultimate induration must therefore be ascribed principally to hydrated silicates of lime. Hence, the writer has considered it expedient to simplify the description of the essential changes by leaving the alumina reactions entirely out of the discussion.

There is no doubt that alumina is a very important factor as regards the formation of the fritted compounds, of which Portland cement consists; but that does not imply that it is as essential to the behavior of masses that have been produced by complete fusion—such as blast furnace slag—nor that it plays an important part in the aqueous reactions of either product.

ON THE ACTION OF THE X RAYS UPON THE DIAMOND.*

The transparency of the different varieties of carbon and of its non-metallic compounds, established by Professor Roentgen and then by the experimentalists who have studied the X rays, may serve to distinguish clearly the diamond from its imitations made of very opaque substances.

The proofs which we have the honor to submit to the Academy show in juxtaposition silhouettes of genuine diamonds and of imitations both loose and set. Prolonged exposure soon succeeds in causing the silhouettes of genuine diamonds to disappear, while false diamonds continue to behave like opaque substances. The same procedure has also allowed us to distinguish natural jet from its mineral imitation.

In addition to this graphic method we have tried an optical method, in which we have tried the fluorescence studied by Professor Roentgen. Diamond and jet, if interposed between the Crookes tube and a leaf of paper covered with a fluorescent substance (e. g., barium platino-cyanide), project upon the paper shadows lighter than those which appear beneath imitations placed near.

Here then we have two very certain tests: the graphic method leaves an irrefutable document, while the optical method is instantaneous. They will easily come into practical use, since a precious stone may be tested even in its setting, and without running any risk.—*Comptes Rendus*, CXXII., p. 457.

Electric Light and Power at Cripple Creek.—Cripple Creek, Colo., has a fine brick electric lighting and power station, with a capacity at present of 170 arc lights and 2,250 incandescents. Both wood and coal are used for fuel; but as coal costs \$5.85 per ton, wood is preferred, and the prices for lighting are naturally high. A 1,000-H.P. addition for power distribution is among the possibilities.

Power for the Hogback Tunnel, Colorado.—The General Electric Company's office at Denver is furnishing the necessary electrical machinery for the construction of the tunnel through the hogback south of Pike's Peak, which is to form a portion of the new water-works system of Colorado Springs. This enterprise is the largest ever undertaken with electricity as the motive power in the West, and among the largest in the country.

The tunnel is to be 6,400 ft. long and will be run from both ends. The air compressors are to be run by a 75 H. P. three-phase motor. The generating station is to be erected a short distance above the Iron Springs Hotel at Manitou and the water necessary for the generation of the electricity is to be taken from the pipe line which now supplies Colorado Springs with water, and after being used for this purpose will be again conducted to the pipe line. The water has a fall at the site of the power station of 700 ft. The power is to be generated by a 150 kw. three-phase generator, which will develop a force of 3,600 volts. The current will be transmitted about eight miles, and will be used to run the air compressors supplying lights and for other necessary purposes.

The water for the system is to be taken from the creeks on the western slope of Pike's Peak, and will be conducted through this tunnel which will be made as small as possible, and leave room for the men to work, probably about 3 x 5 ft. The work of constructing the power station, erecting poles, stringing wires, etc., will be commenced at once, and the machinery will be shipped in about five or six weeks. The contract has been awarded to Wilson & Jackson.

* By Abel Buguet and Albert Gascard.

IRON AND STEEL MAKING RESOURCES OF SOUTH AFRICA.

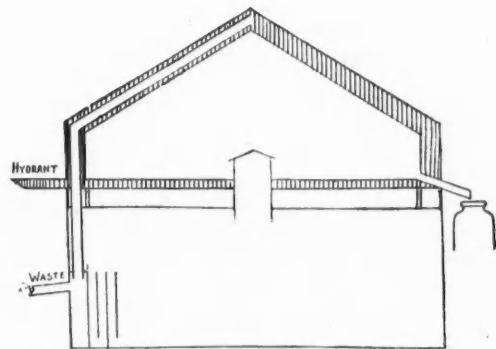
A writer in the *Iron and Coal Trades Review* says: It has been pretty clearly established during the last few years that South Africa is very rich in the useful as well as in the noble minerals and metals. The sections or countries that appear to be more particularly well provided with coal and iron ores are Natal and the Transvaal. In both of these countries coal is now being worked to a considerable extent, and has been so for at least a dozen years, but up to the present time no serious proposals have been put in practice with a view to the carrying out of a scheme for the manufacture on the spot of the iron and steel required for local consumption. That this is only a mere matter of time may, however, be inferred from the fact that at least two different projects have been discussed for the erection of works—in the one case in the Transvaal and in the other case in Natal. In the former instance a concession, which is numbered 531, was granted by President Kruger and the Volksraad in 1882 for the development of a local iron industry, not a long way from Johannesburg. As this concession is likely to be of some interest in view of recent events in the Transvaal, we give the text:

CONTRACT.—The government of the South African Republic, of the one part, and Alois Hugo Nellmapius, residing at the farm of Heatherley, in the district of Pretoria, of the other part, declare to enter into the following contract for the period and upon the conditions hereinafter expressed.

Article 1.—The party of the second part shall set up in this Republic factories and smelting furnaces for the smelting of iron ore, and the preparation and working of all sorts of iron, cast iron, wrought iron, wire iron, and rolled iron, forged iron, tin and steel, iron and steel goods.

Article 2.—The Government of the South African Republic undertakes, for the support of this new industry, to impose an import duty of twopence sterling per pound of iron and steel of all sorts mentioned under Article 1, as soon as the contracting party of the second part has prepared these sorts at his factories, with this understanding that each sort shall be charged with this import duty, as soon as that sort is prepared by him in this country, to the extent of at least a quantity of 10,000 lbs. weight for each of the above-named sorts, and of good and useful quality, but as soon as the contracting party of the second part fails to have the said sort in stock, or ceases the preparation thereof, the Government shall be entitled to revoke the stipulation of twopence sterling per pound duty, both for importation and for other contractors of similar iron works.

Article 3.—The Government undertakes, for the support of this new industry, to claim from every person or every company which, after Mr. Nell-



mapius, or after the signing of this contract, sets up iron-smelting furnaces or iron factories, a duty of three halfpence per pound of iron or steel which may be prepared under whatsoever form in such factories.

Article 4.—The Government shall, on equal terms, give the preference to the contracting party of the second part for all supplies of iron goods required for the construction of Government works, and in putting such works up for tender, it shall, by a special clause, exact the favoring of the native iron manufacture.

Article 5.—The Government shall not, under any conditions whatever, during the term of this contract, grant to anyone any deduction or exemption from import duty on iron and steel or iron and steel goods.

Article 6.—The contracting party of the second part undertakes, upon the signing of this contract, to pay into the Treasury a contribution of five hundred pounds sterling.

Article 7.—The contracting party of the second part shall, for the period that this contract is in effect and in force, pay for the first year a sum of one hundred pounds sterling, with a uniform increase of one hundred pounds sterling for each succeeding year, so that the whole sum to be paid by the contracting party of the second part shall amount to twenty-one thousand five hundred pounds sterling, while for the period of this contract the iron required for the ammunition of the State Artillery shall be supplied by him free of cost.

Article 8.—These amounts shall take the place of the licence or tax which might be charged on factories or on the manufactured article.

Article 9.—This contract is entered into and the stipulations herein contained shall be in force for the period of 20 years, to be computed from the day on which this contract is signed by both the parties and ratified by the Volksraad.

Article 10.—The party of the second part binds himself and his legal successors also. He shall have the right of transferring the rights acquired by him by this contract to a company or companies, or to private persons, who shall take his place in the rights and obligations.

Article 11.—This contract shall be drawn up in triplicate and registered, and shall be signed by both the contracting parties.

Article 12.—Both the contracting parties bind themselves to the accurate and punctual fulfillment of the above contract.

Thus done at Pretoria, this the seventh day of July, One Thousand Eight Hundred and Eighty-two, and ratified by the Volksraad, by Resolutions, dated July 6, 1882, Articles 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732. (Signed) W. EDWARD BOK, Secretary of State.

(Signed) E. P. J. JORRISEN, State Attorney. (Signed) N. M. PRETORIUS, Members of the (Signed) P. J. JOUBERT, Triumvirate. (Signed) A. H. NELLMAPIUS, Vice-President.

With reference to this concession two facts are to be noted—the first,

that it sanctions a duty which, if it had been carried out, would have made it impracticable to import any iron into the Transvaal, and would, therefore, have given a monopoly to the concessionaires; and the second, that it was, like many other concessions, granted with a view to "raising the wind" at a time when the finances of the young Republic were in a very parlous state indeed, and when there did not appear to be the least likelihood of the Boer Government realizing the splendid revenue which it now enjoys.

THE HALL AUTOMATIC WATER STILL.

The advantages of an automatic water still recently placed on the market by E. H. Sargent & Co., of Chicago, over the old-fashioned retort and worm condenser are well known. To say nothing of its greater convenience in operating, the heat saved by feeding warm condenser water into the boiler is a point of vast importance, especially in laboratories and factories where the quantity of distilled water made is considerable. The majority of automatic water stills, however, especially those designed for domestic purposes, possess two great disadvantages, first, they distill very slowly, usually about $\frac{1}{2}$ to $\frac{3}{4}$ gal. per hour, second, they can only be heated with gas or some special burner. It is plain that such an apparatus is unsatisfactory in either a laboratory or a factory owing to its small yield of distilled water, and for domestic use from the point of economy it is a great advantage to be able to use the range, the gas stove, oil lamp, etc. Again in laboratories and factories, even dwellings, steam may be available as a source of heat and could be used to advantage. The accompanying cut represents a water still designed by Vernon J. Hall.

In designing this still the following definite objects were kept in view, viz., first, the utilization of any source of heat; second, the construction of a still of rapid working, adaptable to domestic use, or for use in laboratories and factories, and, lastly, a still of simple construction, operation and economical. The general plan of construction of this apparatus will be seen by the cut and the accompanying cross-section. In its operation the tube marked hydrant is attached to the water supply by means of rubber tubing and water is turned on to fill condenser. When condenser is filled to the apex the water is conducted down a tube seen in the cross-section cut into a trap in the boiler, which serves as a regulator.

When the boiler is filled the supply should be so regulated that the overflow from the waste pipe shall be the least that will suffice to prevent



the escape of steam along with the distilled water. At the side of the boiler is seen a plug for cleaning. This still has been put to rigid test, especially in the Chemical Laboratory of Northwestern University, where it has furnished all the distilled water for over two years. It is spun out of heavy copper and well lined with tin throughout. At present it is made in two sizes, 12 in. diameter and 16 in. for special purposes. The smaller size distills over 1 gal. per hour and the largest one $1\frac{1}{2}$ gals. per hour.

Coppée Coking in England.—The great demand for some time past for coke at the Cleveland and West Coast furnaces is causing coal-owners to adopt other systems of coking than by the old-fashioned beehive oven. These new methods enable coke makers to utilize descriptions of coal which could not be employed with the old process. In some cases the by-products are being recovered, and an installation of 70 ovens is in course of erection at one of the largest pig iron making works in Middlesbrough. The latest plant that has been put into full operation is that at the Randolph pit, between Bishop Auckland and Crook, and owned by the North Bitchburn Coal Company. They have had 60 ovens of the Coppée type built under contract by Mr. Evence Coppée, of Cardiff. Previous to deciding upon the type of oven to be adopted, quantities of the coal intended to be used—which contains from 32.5 to 34% of volatile matter, and is therefore rather dry and requires great heat to coke it—were tried at one of Messrs. Bolckow, Vaughan & Co.'s collieries, where the same ovens are in use, and the results led the North Bitchburn Company to select the Coppée ovens. The by-products are not recovered in this instance, but the waste gases are utilized for firing six Lancashire boilers to supply steam for the colliery machinery. The coke produced is of good quality, hard and bright in appearance, and contains between 1.3 and 1.8 per cent. of moisture. The coal for coking is delivered from the washery into four bunkers capable of storing 250 tons of coal, but the company are about to double the storage capacity. A bridge or gangway connects the bunkers with the ovens, and the coal is taken in "dandies," from the bunkers to the ovens. The water for cooling the coke is pumped direct from the pit into three large tanks placed 60 ft. above the coke oven bank. These tanks are capable of storing 23,000 gals., which is sufficient to cool a day's make of coke of 125 to 135 tons. Each oven burns a charge of seven tons of coal in 48 hours, and gives a yield of 64 to 65% of coke.

WIRE ROPE TRAMWAY AT THE BUNKER HILL & SULLIVAN MINES, IDAHO.

The perfection to which the construction of aerial ropeways has been brought by the Trenton Iron Company is well exemplified by the results attained in the operation of the line built by them for the Bunker Hill & Sullivan Mining and Concentrating Company, of Kellogg, Idaho. The idea that this system of transportation is, at best, an expensive "make-shift," and is available only in cases where the construction of a surface railroad would be impossible, has now been pretty generally exploded, and the improved Trenton ropeways of to-day are proving themselves as economical in construction, as well as in operation, as a fully equipped surface railroad. The line in question presented a great many difficulties not often encountered; among others, the fact that it had to cross over the whole town of Wardner, which it does with one span of 1,100 ft., at a height above the houses of some 125 ft., as shown by the accompanying profile.

The line was started in June, 1890, and has been running continuously since then, with only such interruptions as were due to the long strikes from which this district has suffered. A report dated March 15th of this year, from the company's General Manager, Mr. F. W. Bradley, is as follows:

"In reply to your favor of the 5th inst., regarding the operation of our Bleichert tramway, I am pleased to say that the line is working to our entire satisfaction.

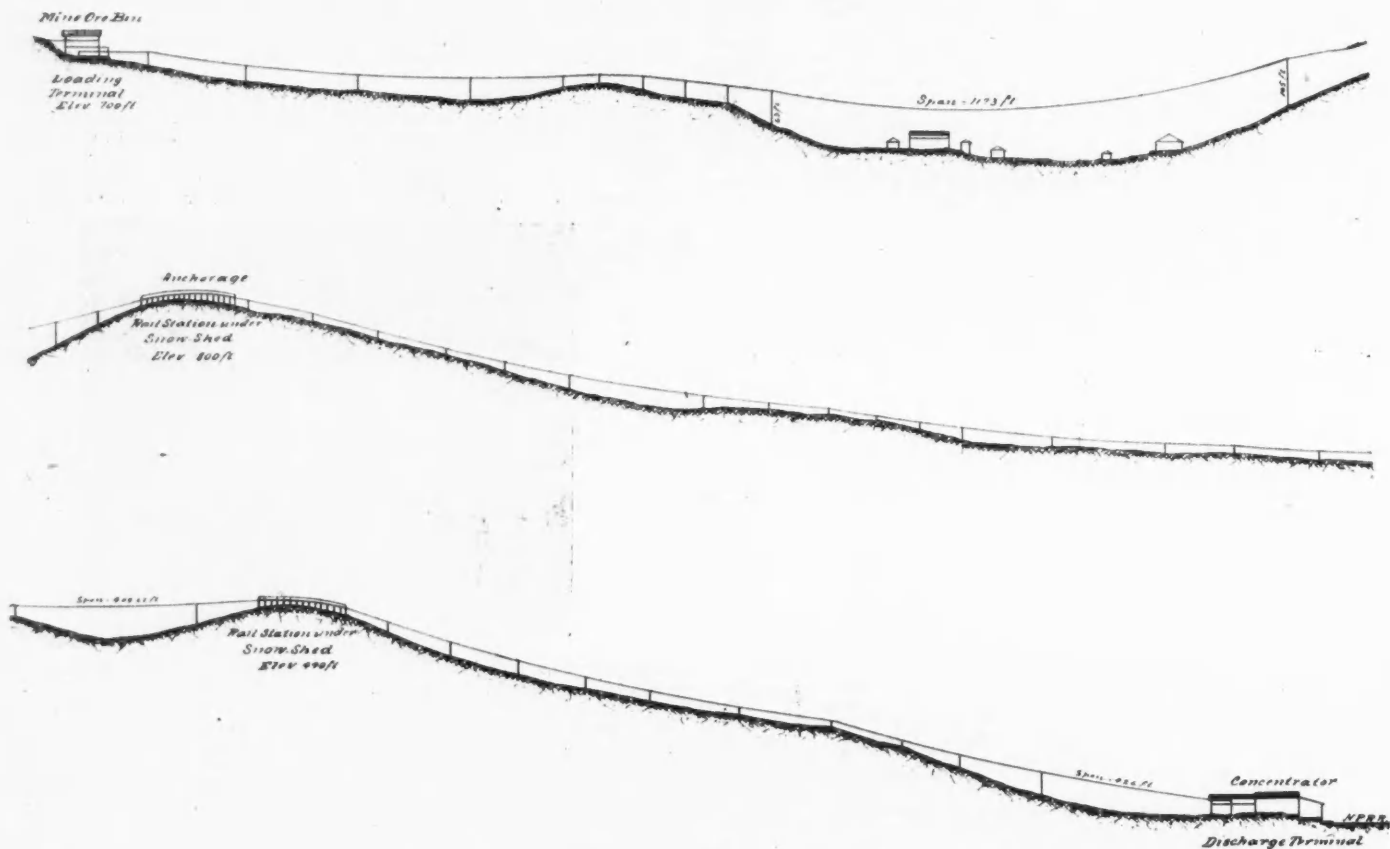
The tramway to date has transported from our mine to our mill 450,000 tons of ore. On the larger portion of the line the original carrying cables are still in use and are apparently good for considerable additional ton-

	Tons	Cost per ton		
		Labor.	Supplies.	Repairs.
June, 1890, to June, 1891, trammed	15,148.88	\$0.24	\$0.010	\$0.000
June, 1891, to June, 1892, "	53,037.21	.20	.057	.033
June, 1892, to June, 1893, "	104,734.52	.108	.019	.037
June, 1893, to June, 1894, "	98,329.86	.078	.038	.094
June, 1894, to Dec., 1894, "	71,220.97	.073	.028	.012
July, 1895	4,919.48	.079	.016	.033
Aug., 1895	10,204.40	.062	.015	.011
Sept., 1895	14,578.71	.032	.015	
Oct., 1895	15,919.72	.057	.014	
Nov., 1895	14,412.67	.062	.016	.033
Dec., 1895	13,981.23	.065	.024	.092
Jan., 1896	15,032.04	.061	.022	.001

This showing must be most gratifying, not only to the operating company, but also to the builders of the line. The main credit for the continued lowering both of the labor and repair items, shown by the table, is due to the able management of the line under Mr. F. W. Bradley, and shows what results are possible under intelligent direction. When we consider that labor costs at least \$3 a day out there, and that the freights on the repair parts are most exorbitant, the results obtained are really phenomenal, the entire operating costs being reduced to 5c. per ton per mile.

In the East, at Syracuse, the Split Rock Cable Road Company, whose line is over three miles in length, with a daily capacity of 750 tons, have, after six years' operating, been able to reduce their figures to about 2c. per ton mile, but, of course, their price for labor and supplies is less than one-half that paid by the Bunker Hill & Sullivan Company.

A more recent installation by the Trenton Iron Company is the line built a year ago for the Trinidad Asphalt Company, which carries 750



PROFILE OF ROPEWAY.

nage. The present traction rope has been in use in transporting 180,000 tons of ore and apparently is still in good condition. During the last six months (September, 1895, to February, 1896, inclusive) the tramway has transported from mine to mill 236,806 buckets of ore in a total working time of 2,208 hours, of which 172 hours were lost, as follows:

- 28 hours changing lugs.
- 93 hours because of repairs (includes coupling in three new pieces of carrying cable at different times).
- 27 hours on account of accidents.
- 24 hours on account of telephone line and electric lights being out of order and ore frozen in chute and other like causes.

In this period the tramway averaged $107\frac{35}{100}$ buckets of ore per hour of total time, or $116\frac{35}{100}$ buckets of ore per hour of actual time in operation. For the above period the average weight of ore carried by a bucket was 732 lbs. There are 127 buckets (5 cu. ft. capacity) on the line, placed 140 ft. apart. The tramway carries from the mill to the mine 10 to 12 cords of wood per day and could carry more if we required it. The operation of the line develops some power, which is used for hoisting purposes.

The total operating and repair crew is as follows:

- 1 foreman. 2 tramway men at mill. 1 brakeman at mine. 4 tramway men at mine. 1 bucketman at mine.

I hope the foregoing, together with the data you already have, will give you all the information you wish regarding our tramway.

The details of the cost of operating the line since its start to the end of January, 1896, are as follows:

tons daily of asphalt, from the world renowned "Pitch Lake" of Trinidad, to an iron pier built about half a mile out at sea, where ocean steamers can lie alongside and be loaded direct from the ropeway cars. As many as three vessels are sometimes being loaded at once from this tramway.

Just at the present time the same company has under construction in the Republic of Hayti one of the longest systems of ropeway ever erected. This line will be 15 miles in length when completed, and is designed to carry logwood for dye purposes from the forests of the interior to the shipping part of Port de Paix.

The use of these lines in the mining camps of Colorado is being extended very rapidly, and the Trenton Iron Company has built five lines in that State during the last year.

Action of Sulphur Vapor on Copper.—Before the recent meeting of the Institution of Electrical Engineers, London, Mr. R. Appleyard read a note on the "Action of Sulphur Vapor on Copper." When a copper wire is exposed for some time to the action of sulphur vapor it becomes entirely converted into sulphide of copper, and it is found that there is a fine axial hole running down the rod of sulphide formed. Rods of copper of square section cut from a block of copper, after exposure to the action of sulphur vapor, also exhibited the axial hole, the rod of sulphide formed being of circular cross-section. In every case the diameter of the rod of sulphide formed is about twice that of the original rod of copper. Delta metal was found to be unacted upon by the sulphur vapor.

THE ACTION OF ELECTRIC CURRENTS ON MINE-SURVEYING INSTRUMENTS.*

By W. Lens.

In view of the rapid increase in the number of electric railways in the Westphalian coal-field and in the use of electric power underground, the question of the action of electric currents on magnetic mine-surveying instruments is of such great interest that the author has been induced to conduct a series of experiments. A point, underground, was selected at

and the last again by day. While the curve of the day results exhibited great irregularities, that of the night results was perfectly regular and in accord with the magnetic records. The irregularities in quite small intervals of time amounted from 2.7 minutes to 5.4 minutes. As at first it was thought that the deviation might be ascribed to the iron-free safety lamps employed, a third observation was made in the morning, the lighting being effected by a stearine candle. The results were exactly the same as on the first day. As the observations were made at a comparatively large distance from other workings, and as the shaft



SPAN 1173 FT.



TOWN OF WARDNER.

a horizontal distance of some 100 yds. from the rails of the Bochum-Herne electric railway, and 434m (1,420 ft.) below it. There, by means of a Fennel's magnetometer with quartz fiber suspension, a series of observations of variation were made based on a fixed line. The magnetometer was previously compared for a long period with the apparatus in the Bochum Town Park, and the two instruments were found to coincide almost exactly. The first observation, in September, 1895, was made by day, the second by night, when the line was free from current,

was 200 yds. away, it is evident that magnetic observations can, under such conditions, be only satisfactorily conducted during the night in the absence of the magnetic current. Another source of error is the safety lamp. Composed of various metals, the lamp in a hot condition sets up thermo electric currents which act on the magnetic needle. In order to obtain information on this point, the author placed six mine surveyors' safety lamps free from iron, one at a time, first in a cold condition then heated, at the pole of a sensitive magnetometer. Of the six lamps examined, two, when cold, had no action on the needle, whilst all acted on it when hot. The deviations observed amounted to from 30 seconds to 160

*Abstracted from *Gluckauf* for the Institution of Civil Engineers, Great Britain.

seconds. A new benzine lamp, that had not previously been used, caused a deviation of as much as five minutes. The deviation increased with the temperature of the lamp. A quite new aluminum safety lamp caused the same deviation when cold as when hot. From these results it follows that the mine surveyor, before making magnetic observations with delicate instruments, should carefully test his lamp. The influence of slight magnetic properties may be lessened by holding the light in the prolongation of the magnetic axis. With side lighting great care is necessary.

DEMOLITION OF A LARGE MILL CHIMNEY.

An account is given in the *Engineer* of the demolition of a tall chimney stack at Manchester, England, the method adopted for which might be of service to some of our readers and save them money over an ordinary builder's mode of procedure.

The chimney was 270 ft. in height; each of the eight sides of it were 11 ft. 4 in. wide. The chimney had a taper of $\frac{1}{4}$ in. to the yard. The foundations were nearly 25 ft. deep, and over 1,100,000 brick were used in the construction of the chimney, which was 28 years old. The estimated weight was 4,000 tons. The owners of the chimney having sold the property, it became necessary to remove it, and it was bought as old building material.

There was an inside brick lining to the chimney, and the inner and outer walls were tied together by eight mifeathers. There was a lean of over 2 ft., in a northerly direction, still it was not considered that it was unsafe. The purchasers of the chimney engaged an experienced rigger to raze it. He caused a portion of the base on five sides (east, south and west) to be cut away for 5 ft. 6 in. in height, and as the cutting away of the brickwork proceeded, timber lintels or carriers were inserted, wedges being used to pack up the bricks, which was a difficult operation, considering that the thickness was 7 ft. 6 in. The timbers were perforated for the reception of resin and other inflammable substances to insure quick combustion. When this work was completed, the spaces between the uprights were filled with shavings, pieces of wood, coal tar, pitch, etc., and over this was poured a considerable quantity of creosote and paraffine oil. A light was applied to the inflammable material and large bodies of flame shot up and smoke poured out of the top of the chimney and from cracks in it. The fire continued with great fury and was fed in places where it was desired to more quickly destroy the timber, with paraffine oil. The stack leaned over to the south and had not gone far out of the perpendicular when the portion near the base dropped into itself, and the support being thus removed the remainder of the structure literally collapsed in telescopic form and fell in a southerly direction. The debris covered an area 75 ft. long by 40 ft. wide. The time occupied in the destruction of the timber supports, that is, the time of the lighting of the timber to the fall, was only seven minutes. Little noise was heard when the stack was falling, but a considerable shock was experienced when the heavy mass fell on the ground. Two tons of coal, a barrel of creosote, two barrels of paraffine oil and 350 cu. ft. of timber were used in the destruction of the chimney. The result of this method of demolishing the chimney is regarded as very satisfactory.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the *Engineering and Mining Journal*.

DUTY ON NATURAL GAS.—The United States Circuit Court recently gave a decision sustaining that of the Board of Appraisers, and holding that natural gas imported is exempt from duty as a crude mineral. The Treasury Department has ordered an appeal taken from this decision in order that the question may be finally settled by the highest court. There are a large number of protests on this subject now pending before the Board of Appraisers which will, of course, be held subject to the final determination of the case. Natural gas is imported from Canada by the pipe lines to Buffalo and Detroit.

CORRECTION OF CERTIFICATES OF MINING CLAIMS.—Where an original certificate of location of a mining claim is subject to amendment, a certificate amendatory of it will relate back to the date of the original. But where the original is void, a subsequent certificate cannot, as an amendment of it, so relate back.—*Moyle vs. Bullene* (44 Pacific Reporter, 71), Court of Appeals, Colorado.

LIEN FOR COAL FURNISHED MANUFACTURING COMPANY.—Under the laws of North Carolina disabling corporations from conveying their property, by mortgage, freed from liability on a judgment obtained against such corporations for labor performed, for material furnished or wrongs committed by such corporations, their agents or employees, liens for coal furnished after making the mortgage are superior to it, the coal being used by such company to enable it to operate its plant.—*Pochontas Coal Company vs. Henderson Electric Light and Power Company* 24 South-eastern Reporter, 22), Supreme Court, North Carolina.

LOCATION OF MINING CLAIMS IN TOWN LIMITS.—The fact that land on which discovery and location of a mining claim are made is within the patent limits of a town will not affect the title of the locator, where it was known prior to the patent of the town that valuable mineral veins existed where the discovery and location were made afterward. In ejectment for a mining claim, where it appears that the discovery shafts of both parties are identical, evidence that the discoveries were made on lands patented prior to the dates of discovery of either party should be admitted, and the jury instructed if that fact were found, neither party could recover.—*Moyle vs. Bullene* (44 Pacific Reporter, 69), Court of Appeals, Colorado.

DEED OF TRUST ON MINING PROPERTY.—Where such a deed does not cover the profits arising from the business, the profits accruing before the commencement of an action cannot be intercepted by the appointment of a receiver and applied upon the mortgage debt, either directly or indirectly, through the use of same in the operation of the business. Where the deed covered all the personal property of every kind, now owned or hereafter to be acquired and owned and used, in connection with and for use in developing and operating its said coal mines; authorizing the grantor to take and use the rents and income until default, such mortgage

did not cover the profits or proceeds of the business of mining, such as coal, coke, and iron mined and manufactured, and accounts from the sale of same.—*Alabama National Bank vs. Mary Lee Coal and Railway Company* (19 Southern Reporter, 404), Supreme Court of Alabama.

Japanese Enterprise.—The Japanese Government has decided to ask Parliament for a vote of a million yen (about \$1,000,000) to provide subsidies for steamers trading with Europe. It is also stated that the great Japanese Shipping Company, the Nippon Yusen Kaisha, is about to raise its capital (at present nine million yen) to fifteen millions (about \$15,000,000), before putting its boats into the new European service.

The Tehuantepec Railroad.—The English contracting firm of S. Pearson & Sons is taking over the National Railroad in Tehuantepec, Mexico, on lease, with a contract to repair the road and to improve the ports of Coatzacoalcos and Salina Cruz. The contract involves the expenditure of \$15,000,000. A Mexican firm intends to establish a line of steamships on both the east and west coasts, connecting with the railway, and expects a heavy transcontinental traffic.

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 APRIL 7TH, 1896.

- 557,548. **MINER'S SAFETY LAMP.** Karel Broucek, M. Ostrava, Austria-Hungary. Combination, with a lamp, of a filling apparatus, consisting of a plunger-valve cylinder, with helical spring, of a key fitting over the said valve, a pressure handle, a pressure button and a filling tube, with an opening and means for operating the same.
- 557,745. **MINING MACHINE.** Charles E. Wolfendale, Allegheny, and George W. Fritz, Pittsburg, Pa. Combination of two cutting disks, a driving shaft meshing with one of the disks, a socket piece provided with an enlarged cavity on its upper surface, the upper cutting disk being provided with a journal pin having an enlarged head fitting in the cavity and means for securing the journal pin in its socket.
- 557,861. **ROLLING MILL ADJUSTMENT.** George W. McClure, Pittsburg, Pa. Combination with a roll having movable bearings, of screw shafts arranged to adjust the bearings, a cross shaft carried by and arranged to actuate the screw shaft and having a gear wheel, an actuating wheel, and a traveling gear wheel arranged to constantly intermesh therewith and communicate motion therefrom to the gear wheel upon the cross shaft.
- 557,864. **MINER'S HAT.** James McNamara and Frederick W. Pepler, Calumet, Mich. A resilient outer shell, a lining within and spaced from the shell and a series of spring clips for securing the lining to the shell each clip consisting of a metal plate bent between its ends to form downwardly extended members, one member being secured to the lining and the other to the shell.
- 557,880. **APPARATUS FOR CONDENSING FUMES FROM SMELTING FURNACES.** Hannibal W. Rappleye, Philadelphia, Pa. A conveyor with a spiral passage partially submerged in water, the conveyor being of decreasing area above the water line and the walls of the passage converging from its inlet to its exit.
- 557,958. **METHOD OF AND APPARATUS FOR KEEPING TUNNELS, ETC., FREE FROM RUBBISH PRODUCED BY BLASTING.** Alfred Brandt, Uhlenhorst-Hamburg, Germany. Filed January 6th, 1896. Patented in Germany September 18th, 1894, No. 81,320; in France September 18th, 1894, No. 241,464; in Belgium September 19th, 1894, No. 111,886; in Switzerland September 20th, 1894, No. 3,210; in Italy September 30th, 1894, LX XIII, 114, and in Austria December 31st, 1894, No. 446,566. The method consists in directing, when the blasting charges are fired, jets of water under high pressure against the head and rearward, which so deflect the debris from their path that they are deposited upon the bottom of the gallery at some distance from the head at the sides of the rails and are distributed over a sufficiently long distance, whereupon the water is turned off and the boring of new blasting holes may be at once commenced. The apparatus consists of a pipe supplying water under high pressure and a head at the end of such pipe, such head being provided with two sets of holes at its end which are so directed and arranged that the jets from one set of holes cover the head of the structure and those from the other set of holes cover the rails.
- 557,979. **APPARATUS FOR SOLDERING PLATES OF IRON OR STEEL WITH SHEETS OF COPPER OR ITS COMPOSITIONS.** Erik W. Encquist, Brooklyn, N. Y. Combination with rolls adapted for pressing the plates and sheets together and melting the uniting element, and at the same time passing the plates along between them, of one or more pairs of cooling and pressing rolls to receive the united plates from the hot rolls and continue the pressure in the cooling process.

Great Britain.

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

WEEK ENDING MARCH 7TH, 1896.

- 3,509 of 1895. I. W. Swan and I. A. Kendall, London. In making cyanide by passing air over carbon and alkali, using a vessel of nickel, enclosed in one of earthenware, with an intermediate atmosphere of hydrogen which permeates the nickel and prevents the destruction of the apparatus.
- 7,867 of 1895. W. Firth, Leeds. Making pit girders and props with perforations and supports so as to facilitate putting them together *in situ*.
- 10,442 of 1895. J. Finlay and E. W. Derry, Johannesburg. Making cyanides, by first passing nitrogen and sulphur dioxide over carbon and alkali, so making sulpho-cyanide, treating the latter with weak nitric acid and passing the hydrocyanic acid into caustic soda.
- 16,502 of 1895. E. Ducretet and L. Lejeune, Paris. Apparatus for making acetylene from calcium carbide.
- 23,580 of 1895. C. Kellner, Vienna. Producing cyanides by subjecting nitrates to the action of the electric arc.
- 749 of 1896. J. Daniell, Champion Reef, India. Concussion nut or collar for rock drills to allow a little elasticity.

WEEK ENDING MARCH 14TH.

- 5,592 of 1895. W. H. Scott, Norwich, and H. J. C. Keymer, Johannesburg. In electric rock drills, the use of a special pneumatic mounting for the drill, to prevent jarring.
- 6,365 of 1895. C. Craig, Durham. Plant for catching the fine coal which goes away with the water in coal washing plant.
- 9,210 of 1895. S. Jorgensen, Copenhagen. Making slag cements set quicker and more durable on surface by adding to the cement a proportion of slag cement which has been set and roasted.
- 1,116 of 1896. F. R. Ruosset, Berlin. Apparatus for producing acetylene from calcium carbide.
- 1,501 of 1896. L. Thomas, Liege, Belgium. Improvements in wedges used in collieries where explosives are not allowed.

PERSONAL.

MR. GEORGE J. SMITH has been appointed Superintendent of the Grant gold mine, Tuolumne County, Cal.

MR. F. B. PETERSEN, of the Tongshan mines China, has resigned and joined the Imperial Chinese Railways as one of the civil engineers.

MR. EDWARD D. SELF, mining and mechanical engineer, of South Orange, N. J., recently returned to the United States from Sonora, Mexico, and is now in London, Eng., on professional business.

MR. ARTHUR W. JENKS has resigned as superintendent of the Balbach Smelting and Refining Company, Newark, N. J., to accept a similar position at the mines and works of the "Establecimiento Mineral de Casapalca," in Peru. He sailed on April 10th.

MR. H. S. HACKBUSH having retired from the Hackbush Price Assay Company, of Colorado Springs, Colo. Mr. J. A. V. Price has associated himself with Mr Robert Strain, and will conduct the business as usual. The firm will be known as the Price Assay Company.

MR. WILLARD S. MORSE is the latest of the many successful engineers, metallurgists, chemists, etc., who have secured excellent engagements through the "Positions Vacant" column of the *Engineering and Mining Journal*. He has been placed in charge of the silver mining property owned by the Huautla Santa Ana Mining Company, State of Morelos, Mexico.

OBITUARY.

WILLIAM ANDERSON, a prominent resident of Normal, Ill., died there on April 11th, aged 81 years. He was a native of Pennsylvania and was one of the "fifty-niners" who went to Pike's Peak in quest of gold.

WILLIAM H. EVERSON died at Pittsburg, Pa., on April 11th, aged 80 years. Two decades ago the firm of Everson & Preston was one of the best known in the iron trade. William H. Everson has been known as the father of the sheet iron industry.

CARLOS PEREZ a well-known Peruvian civil engineer, died in Chachapoyas, Department of Amazonas, Peru, on February 7th. He worked on the Colon Section of the Panama Canal from 1882 to 1885 and returning then to Peru was engaged in Government work there. He had lately been building roads and studying means in the Peruvian-Amazon valley.

JUSTUS MITCHELL SILLIMAN, for 25 years professor of mining, engineering and graphics at Lafayette College, at Easton, Pa., died there unexpectedly on April 15th, aged 54 years. He was graduated at the Rensselaer Polytechnic Institute in 1870, having taught five years previously in the Troy Academy. He went to Lafayette in 1871, and soon after was made a professor in full standing. For a number of years he held the George B. Markle professorship of mining engineering. He was a member of the American Institute of Mining Engineers and of the American Association for the Advancement of Science and a contributor of papers to the proceedings of both.

SOCIETIES AND TECHNICAL SCHOOLS.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL, MINN.—A regular meeting of the society was held on April 4th. The meeting was devoted chiefly to routine business, the Constitution and By-Laws having been amended in some particulars. Mr. Tracy Lyon read a paper on "The Maintenance of Railway Rolling Stock."

SOCIETY OF CHEMICAL INDUSTRY.—The next meeting of the New York Section will be held at 115 West Sixty-eighth street, on April 20th, at 8:15 p.m. The following papers will be read: J. Dawson Hawkins, on the "Chlorination of Gold Ores," and E. G. Love on "The Effect of Compression of Illuminating Gas upon its Candle Power"; also some miscellaneous communications.

INDUSTRIAL NOTES.

The Ohio Steel Company at Youngstown, O., has resumed paying its 800 employees at the old rate of wages.

On March 31st the New York Belting and Packing Company, shipped 33 miles of hose from its Passaic, N. J., factory alone.

The Chattanooga (Tenn.) Foundry and Pipe Works has purchased the property formerly occupied by the South Tredegar Iron Works.

The Thomas Iron Company, of Catasauqua, Pa., has just received a shipload of Cuban iron ore, containing 2,600 tons, for use at its Hellertown furnaces.

The Union Traction Company, of Philadelphia, has placed an order with the North Branch Steel Company, of Danville, Pa., for 1,000 tons of heavy steel rails.

The Alice Furnace, of the Wheeler Furnace Company, at Sharpville, Pa., recently produced 201 tons of pig iron, the largest quantity in one day ever made at that furnace.

The Sargent Company, of Chicago, Ill., has just completed a Bessemer converter for making Walrand Legenise steel, and is prepared to make steel castings by this process.

The Chester Mining and Manufacturing Company has been organized at Roanoke, Va., with \$100,000 capital stock. The officers are W. H. Sproul, president; J. T. Sampson, manager.

The Robesonian Furnace, at Robeson, Pa., which was blown out a short time ago for repairs, was operated for 18 months, and in that period made 90,000 tons of pig iron. The furnace is 80 x 18 ft.

The Potts Brothers Iron Company at Pottstown, Pa., has given notice that the wages of its puddlers will be increased from \$2.25 to \$2.75 per ton on May 1st, with a corresponding increase in other departments.

The Hawkins Steel Company, Limited, of Detroit, Mich., has been incorporated by Frederick W. Hawkins, Charles P. Larned, Lester E. Larned, Bertram C. Whitney and Robert N. Atkinson, with a capital stock of \$100,000.

The New York City office of the New Jersey Zinc and Iron Company, which for many years has been at the corner of William and Platt streets, was removed April 15th to the Montauk Building, corner of William street and Maiden lane.

The Lackawanna Iron and Steel Company is building roasting ovens at Scranton, Pa., at a cost of over \$140,000. When they are completed the roasting of the Cornwall ores will be done at Scranton instead of at Cornwall as heretofore.

The nail works of the F. & G. Brooks Iron Company resumed work on April 13th. The puddlers will be paid \$2.75 per ton, the price to take effect from that date. The puddle department has been idle for 1 week, the men having refused to work for less than \$2.75 per ton.

The Parke & Lacy Company, of San Francisco, Cal., reports the shipment of two 150x14 ft. Ropp Straight Line Furnaces to Broken Hill Proprietary Company, Australia, and a 60-H. P. boiler, 50-H. P. engine and hoisting and pumping machinery to the Salisbury mine, Placerville, Cal.

The stockholders of the Sloss Iron and Steel Company held their annual meeting at Birmingham, Ala., on March 23d. Officers were elected as follows: Thomas Seddon, president; E. W. Rucker, vice-president; W. L. Sims, secretary and treasurer; George Jamme, general manager.

The Berlin Iron Bridge Company, of East Berlin, Conn., has the contract to furnish the steel work for the new boiler plant of the New Britain Knitting Company. The roofs of the buildings will have steel trusses throughout, and in designing these buildings everything has been so constructed as to render them fireproof.

The Phillips Mine Supply Company, Pittsburg, Pa., has contracted to erect steel triples for the Charters Block Coal Company, Essen, Pa.; Imperial, Pa., Coal Company, and Pawnee Coal Company, Westville, Ill. A new plant for the J. H. Somers Fuel Company will also be erected together with a 12½ capel fan for J. W. Ellsworth & Company.

Willis F. McCook, representing Pittsburg and New York capitalists, last week purchased the large plant of the Columbian Iron and Steel Company, located at Uniontown, Pa. The purchase price is not given, but the mill was recently constructed at a cost of \$800,000. It is proposed to make such changes as will permit the manufacture of steel billets by July 1st.

The Marietta (O.) Boiler Works have been organized with the following officers: John Galloway, president; J. W. Hughes, vice-president and general manager; J. J. Leidecker, treasurer, and W. G. Hays, secretary. This corporation will also have charge of the Hughes Bros. Boiler Works at Butler, Pa. Seven acres of ground have been secured at Marietta and construction will begin at once.

The recently-organized Keystone Axle Company, which is now having its plant erected at Beaver Falls, Pa., at its annual meeting in Baltimore recently, elected these officers: D. A. Clark, of Baltimore, president; J. T. Rowley, of Tyrone, vice-president; and Thomas R. Torrence, of Pittsburg, secretary and treasurer; Messrs. D. A. Clark, John T. Rowley, H. D. Bulkley, A. R. Leyda and W. A. Christ, board of directors. One of the company's specialties will be the manufacture of a new car axle invented by Mr. Rowley.

The Bates Thermic Motor and Carbonaceous Gas Company was incorporated last week. The capital stock authorized is \$10,000,000, with \$2,500 issued for the purpose of incorporation. The principal offices of the company in New Jersey will be located in Camden, with branch offices in New York and Philadelphia. The company is organized for the purpose of manufacturing combustible gas, thermic engines, boilers, etc., under the patents of Maurice Morris. The incorporators are Russell Thayer, George H. Holgate, Francis Gordon, Bennett Sate and James M. Jordan, of Philadelphia, and H. G. Gill, of Woodbury, N. J.

The Fischer Foundry and Machine Company, of Pittsburg, Pa., manufacturers of the Pittsburg boiler, has received a contract from the Conneaut Ice Company, Allegheny, for a 300-H. P. boiler, and a fourth order from the Midvale Steel Works, Philadelphia, for a 200-H. P. The company is furnishing two engines for the Merritt Apartment House, New York; two tandem compound engines for the Royal Insurance Company, Chicago; 400-H. P. four-valve engine to the Rockford (Ill.) General Electric Company; 200-H. P. four-valve engine to the Owassa (Mich.) Light and Power Company, also for a direct connected engine for the Waller Building, Chicago.

AMERICAN REALTY COMPANY.—The iron mining property of the insolvent American Realty Company was sold recently for \$41,300. This land consists of iron mining property in the Gun Flint Lake country extending across a portion of Minnesota, Northern Wisconsin and Michigan. The lands are said to be valuable, and the purchase was made by George W. Jenks and R. B. Brown. The money paid for the property goes to Assignee Louis A. Reed, of the corporation. The American Realty Company is one of the corporations organized by Kortgaard, and the money received will ultimately be distributed among the creditors of the American Exchange and State banks.

Mr. T. D. Kauffelt, manager of the Princess Furnace, at Glen Wilton, Virginia, reports that the stack, which was last blown in on the 4th of November, 1895, has not made a cast of gray forge pig iron since the date named, when it produced 9 tons of forge and 10 tons of No. 2 and 8 tons of No. 3, foundry. The furnace is a small one, being only 60 x 12½ ft. The charge of coke, which is never changed, amounts to 3,250 lbs. On December 24th the burden of ore was made 6,400 lbs., almost double that of the coke, and on February 20th it was further increased to 6,480 lbs. The heat of the blast has been from 925° to 1,025°. The furnace has not lost a tuyere or cooler since December 6th. It is owned by D. S. Cook, of Wrightsville, Pa.

Boys, Porter & Co., of Connellsville, Pa., are running their plant partly overtime. They have recently shipped mine pumps to the First Pool Gas Coal Company, Willock, Pa., two pumps to the Oliver Coke and Furnace Company, Oliver Works, one special double plunger pump to the Bodewy Lumber Company, Stamps, Ark.; one pump to L. C. Trent & Co., Salt Lake City, Utah; a large double plunger mine pump to the McCure Coke Company, Lemont, also one of the same pattern to the Redstone Works of the H. C. Frick Coke Company. The firm has placed three pumps in the plant of the National Brewing Company, Jeannette, and is duplicating a pump recently furnished the H. C. Frick Coke Company, at Lemont, having 30-in. steam cylinders, 12-in. double wood plunger and 30-in. stroke. A special brine pump has been furnished the Yough Crystal Ice Company, of Connellsville, while a large amount of silver ore crushing machinery has been shipped to the Eureka Hill Mining Company, Eureka, Utah.

Sealed bids for building Section 6 of the subway in Tremont street, from Park street to Scollay square, Boston, Mass., in accordance with the form of contract and specifications to be furnished by the Boston Transit Commission, will be received at its office, 20 Beacon street, Boston, Mass., until May 7th, 1896. The section is in a crowded street in the heart of the city, street railway tracks traverse it lengthwise and there are numerous important buildings on each side. It is intended that most of the work shall be done by tunneling, and little of the surface can be occupied during the day. The section is approximately 1,065 ft. long. The subway from Scollay square to Hamilton place, a distance of about 1,035 ft., will consist of masonry side walls and a masonry arch springing therefrom, spanning two tracks. From thence to the junction with the work already built in front of Park street Church, there will be two single-track subways, of construction similar to that of the two-track portion—each being about 50 ft. long. Further particulars will be furnished on application.

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.

CONSOLIDATED KANSAS CITY SMELTING AND REFINING COMPANY.—Lee, Higginson & Co., of Boston, offer for sale preferred stock of the Consolidated Kansas City Smelting and Refining Company. The authorized issue of preferred stock is \$2,000,000, par \$25, entitled to 7% cumulative dividends and to share pro rata with the common stock after 10% has been paid on the common shares. The Consolidated Kansas City Smelting and Refining

Company is a consolidation of three smelting plants, and it is now the largest smelting plant in the world.

The annual report for 1895 shows: Gross earnings, \$597,859, and operating expenses, \$96,478, leaving as net earnings \$501,381. Interest and exchange amounted to \$229,078, leaving a total net profit of \$272,303, of which there was charged to profit and loss account \$66,592, leaving a surplus of \$205,711. At present there is but \$228,500 preferred stock outstanding. There are \$1,000,000 first mortgage 6% bonds, due 1900, and \$2,500,000 common stock. The sale of \$1,771,500 preferred stock is made to place the company in a position which its extensive and growing production demands and will give it a large working cash capital.

OIL EXPORTS.—Exports of mineral oils from the United States for the month of March are reported by the Bureau of Statistics, Treasury Department, as follows: Crude, 8,510,998 gals.; naphthas, 1,007,522 gals.; illuminating, 50,696,558 gals.; lubricating and paraffin, 4,028,618 gals.; residuum, 26,418 gals.; total, 64,260,114 gals., showing an increase of 4,276,970 gals. over the corresponding month last year. For the nine month of the fiscal year from July 1st to March 31st the total exports were 650,676,974 gals.; a decrease of 23,513,159 gals. from the corresponding date last year.

ALASKA.

ALASKA TREADWELL GOLD MINING COMPANY.—This company reports its clean-up for March as follows: Period since last return, 29 days; value of bullion shipped, \$38,181; ore milled, 17,940 tons; sulphurets treated, 282 tons; value of bullion obtained from sulphurets, \$12,664. The gross expenses for the month have been \$24,649.

ALASKA TREADWELL AND MEXICAN.—The steamer *Willapa*, which arrived at Seattle, Wash., on April 15th from Alaska, brought news of a terrible explosion in the new tunnel between the Treadwell and Mexican mines on April 3d. Four men were fatally injured.

BERNERS BAY DISTRICT.—An important mining deal has just been consummated, says the *Juneau News*. The claims embraced in the transfer consist of the Undine, Banshee, Mineva and Cover, and are situated in the Berners Bay District, near the Berners Bay Mining and Milling Company's property, being on the opposite side of the hill. They were discovered and located last July by Messrs. Dwight H. Hurlburt and Frank Cook, and are situated advantageously in regard to their cheap operation. Their elevation above sea level is but 750 ft., and the ascent from the beach, three miles distant, is so gradual that a wagon road could be built direct to the tunnel at comparatively small expense. The general trend of the country is northwest by southeast, the formation being principally granite and syenite. There is a great similarity between the ore from these claims and that from some of the Berners Bay Company's property, its value consisting about one-half in free gold and half in its concentrates. A peculiarity about the location of these claims, that is of value to their owners, is that they lie in the midst of a heavy belt of spruce timber, trees 5 and 6 ft. in diameter being of frequent occurrence. Good water power is also available, which runs summer and winter without intermission and has sufficient power to drive 200 stamps. Judge H. W. Mellen and Mr. Reed Redmond secured a bond on this property last November. A force of men was immediately put to work running a crosscut tunnel to tap the ledge a considerable distance below the croppings. The tunnel was driven in 360 ft. with the result that three distinct and well defined ledges were cut, one at 50 ft., another at 150 ft., and a third near the end of the tunnel at a depth of 250 ft. on the ledge. Mr. Lewis Taylor, of Evansville, Ind., who represents the Eastern members of the syndicate, is in Juneau, and has made an inspection of the property.

ALABAMA.

BIBB COUNTY.

SOUTHERN CAHABA MINING COMPANY.—A short time ago this company opened a coal mine a few miles from Blocton, tapping a good vein, the output of which is increasing every month. The main entry has gone down 700 ft. and more than 100 tons of coal is being mined every day. The mining camp has been named Hargrove, after Colonel Hargrove, of Tuscaloosa. Mr. T. H. Aldrich is at the head of the company.

ARIZONA.

COCHISE COUNTY.

JOHNSON-FITTS.—Mr. R. J. Jackson, representing California capitalists, who was at the Johnson mine, in Pearce District, the past fortnight, left the new camp last week for San Francisco, taking with him numerous samples, and prepared to make an exhaustive report to his company. At 55 ft. on an incline, when the big ledge was first tapped, the ore was of fair grade and was reported to average \$20 to \$25 per ton. For 12 ft. the width of this character of ore continued in the crosscut, but now the character has varied suddenly on the same ledge and for 2 ft. or more the last work done has been in a chloride ore, any sample of which is said to assay over \$100 per ton.

CALIFORNIA.

CALIFORNIA MINERS' ASSOCIATION.—The River and Harbor bill passed by the House last week contains a provision for the appropriation of \$250,000 for impounding mining debris. Julian Sonntag,

secretary of the association, has received in writing an opinion from Attorney-General Fitzgerald as follows: So far as the appropriation feature of the California Debris Commission act of March 24th, 1893, is concerned, I am of the opinion that this feature of the act admits of but one construction, and that is that whenever Congress makes an appropriation of \$250,000 for the purposes specified in Section 4 thereof this appropriation of \$250,000 therein made will be immediately available for those purposes.

AMADOR COUNTY.

BELLWETHER.—Work will be commenced on this mine in a few weeks. The shaft will be sunk at least 500 ft. and possibly 1,000 before the ledge is prospected.

(From Our Special Correspondent.)

SOUTH EUREKA.—At this mine, one mile south of Sutter Creek, they are sinking from the 1,050-ft. level. The mill is running steadily on ore from the 950 and 1,050-ft. levels. A new level is to be opened up at the 650 ft.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

ORO Y PLATA.—At this mine, located east of Angel's, on Wade's Flat, the incline shaft is down 200 ft. through the lava; no timbering is required. There is a good body of gravel at this point which will average about \$5 per ton. Drifts are being run to intersect the west run. There are 12 men employed.

MONO COUNTY.

BULWER CONSOLIDATED MINING COMPANY.—At the annual meeting of the stockholders of this company, held in San Francisco on April 8th, there was considerable excitement displayed by the two "factions." Both sides—the old regime, headed by Herman Zadig, and the opposition, headed by N. Westheimer and A. Krause—claimed a victory. Until the courts could decide as to the legality of voting stock and proxies, Mr. Zadig, who presided, declared the meeting adjourned for 30 days, and he and the old board retired from the scene, and Secretary J. E. Jacobus locked up all the books in the safe. The Westheimer party, claiming that they had a majority, went on and held an election among themselves, and elected the following directors: N. Westheimer, S. L. Ackerman, L. Klan, F. Avery, W. H. Metson, A. Krause and J. W. Pew. N. Westheimer was elected president, S. L. Ackerman vice-president, L. Klan treasurer, and J. W. Pew secretary. To this proceeding, Edmund Tausky, attorney for the old management, made a formal protest. After their election, the contestants made a formal demand upon Secretary J. E. Jacobus for the books of the company, which he, acting by advice of counsel, refused to accede to. The Westheimer party will apply through counsel to the court for an order for Secretary Jacobus to deliver the books. There is likely to be much litigation before it is known which side controls the mine. Meantime the old management is in possession and the office business is being transacted as usual. There is a point involved as to whether stock or proxies can be voted at a mining election by parties other than the actual owners, which is of the greatest interest, and the Bulwer Consolidated will give the courts a chance to pass upon it and settle the question forever.

NEVADA COUNTY.

ALLISON RANCH.—James Flood, Superintendent Kervin, W. R. Eckart and some others are making arrangements to start up this mine at once. Mr. Eckart, the consulting engineer, is preparing plans for a first-class plant. It will take several months to equip and open the Allison Ranch. The mine is about 700 ft. in depth and sufficient drifts are opened up to employ quite a force of men. At one time nearly 300 miners were at work on this old property.

SOUTH IDAHO MINING COMPANY.—At a meeting of the stockholders of this company, held on April 1st, the following gentlemen were elected to serve as a Board of Directors: W. H. Crase, J. H. Smitham, W. J. Rogers, Jos. O'Keefe and Jas. McKenna.

PLACER COUNTY.

(From Our Special Correspondent.)

REDSTONE.—This mine, two miles from Blue Canyon and 13 miles from Dutch Flat, is now being opened up by Idaho parties. Five stamps will be added to the present five-stamp mill and a large mill will be erected later.

PIONEER.—The output from this mine, according to the report of the company, was \$17,512 for the month of February. A 40-stamp mill will be erected.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

A ledge has been located by the Ashford Brothers, 60 miles east of Mojave and 13 miles from water. The vein, which prospects very well in fine gold, is 2 ft. wide and about 2,500 ft. long. A rush of men to the place has begun.

SHASTA COUNTY.

NICHOLS.—County Treasurer Jackson has bonded this mine on Squaw Creek, from Wallace, Saeltzer & Co. Some of the clay taken from the side of the ledge when assayed gave a return of \$10 in gold and \$6.60 in silver per ton. The drift work will be continued until the width of the ledge is ascertained. An estimate of the width is given as 105 ft.

(From Our Special Correspondent.)

TEXAS CONSOLIDATED.—This mine is eight miles north of Redding and comprises 520 acres. Work is going on about 250 ft. below the fifth level. The ledge is from 6 to 10 ft. wide and the ore is rich in free gold. The mill and chlorination works are running steadily.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

The discovery of four new ledges is reported in this county, the ore ranging from \$20 to \$100 per ton. An electric plant is being erected on Big French Creek.

TUOLUMNE COUNTY.

GRANT GOLD MINE.—This property is located at Grizzly Gulch. The president, Mr. T. N. Machin, writes that last week tunnel No. 3 was extended 4 ft. through quartz assaying \$8 per ton, making the total length of this tunnel 145 ft. The face of the tunnel is in quartz.

RAWHIDE.—A good strike is reported to have been made recently in this mine. A pocket is said to have been found at the 930-ft. level, the extent of which is not known, which contains a large amount of free gold.

COLORADO.

BOULDER COUNTY.

(From Our Special Correspondent.)

BIG SIX MINING COMPANY.—This newly organized company has secured control of the Miser's Dream, and is putting in a new plant of machinery, at the completion of which development work will begin.

CYANIDE WORKS.—A boulder company is engaged in erecting a cyanide mill on the Howard ranch, near the Logan property, and expects to handle the output from the Logan.

DEW DROP.—A large vein of iron has been opened up and shipments are regularly made.

FIRST NATIONAL.—A force of men has been engaged, and the mine is being put in shape preparatory to active development.

GOLD LAKE.—J. R. Carnahan has made a good strike and is working a rich streak 6 in. wide. The mill ore is 3 ft. between walls.

GOLDEN RULE.—The manager of this property, which was sold at sheriff's sale recently, is preparing to resume operations on the Golden Rule placer, and a force of men will be put in shortly.

HERCULES.—Richard Ball has struck a pay streak 6 in. wide, and is pushing development.

LOGAN.—The discovery of a small streak of rich ore in the Logan has opened out into a massive body of quartz running very high in gold and excitement is on the increase.

TALCOTT.—A new pipe line 3,000 ft. long is being put in to furnish motive power for the machinery.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

CECIL.—The shaft is being sunk another 100 ft. to reach an ore body pitching toward it. Lessee working the mine recently made a shipment, the first class running \$286 a ton and the second class \$91.

GUM TREE.—Denver parties recently took charge of this property and after hoisting the water out of shaft to a depth of 260 ft. began extending the lower level westward. A big ore chute opened out and shipments are to be made at once.

LAMARTINE.—Since the completion of the drainage tunnel, almost one mile in length, the owners have been driving an upraise on the big body of mineral cut while driving the tunnel. A personal investigation shows the streak to be 8 ft. wide and 300 ft. in length, with 600 ft. of stopping ground to the surface. The management says that it is hard to estimate the amount of ore in the block of ground until the upraise is completed. As the same ore chute appears in the tunnel a winze will probably be sunk and levels extended to get under it.

MINERAL OUTPUT.—The *Rocky Mountain News* has published figures showing the smelting output of the country for the first three months of 1896, compared with the same period of 1895. There were 4,877 tons in 1895, valued at \$268,235, and in 1896, 8,968 tons valued at \$556,016.

The lower end of the country shows the greatest increase on account of the many gold discoveries of the past three years. The increase was 144% on smelting ore.

SILENT FRIEND.—In putting through an upraise from one of the adit levels, a large body of ore was opened out, measuring 100 ft. in length and 2 ft. wide. It is 400 ft. to the surface and the upraise may be continued for this distance. A test run from the entire streak returned \$350 a ton and it is considered one of the most important strikes ever made in the Idaho Springs district.

SUN AND MOON.—Some difficulty was experienced by the Cleveland people in getting a clear title to the group of claims, but this has now been completed and work started up. J. W. Britton, a rolling mill man and W. J. White, both of Cleveland, are giving the property personal attention.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

(From Our Special Correspondent.)

ANCHOR.—This property, on Gold Hill, will be ready on or about May 1st to do mining on a large and economical scale. The new shaft and the new ma-

chinery is under the superintendence of Mr. Alton L. Dickerman as consulting engineer. One of Allis' 80 H. P. boilers is in place; the bed for the engine is well laid in a separate building. The 3-compartment shaft has been sunk 250 ft., and will be ready to tap the vein with a crosscut at the 300 ft. before May 1st. The mine justifies such an outlay, as the veins are yielding plenty of good ore. The lessees are working their claims for all they are worth.

BOSTON & CRIPPLE CREEK.—This claim, situated about two miles north of the town of Cripple Creek, has a shaft sunk 220 ft. deep. The rock, or vein, is largely a pyritiferous porphyry, and during the last few days the crystals of iron pyrites are fairly large and carry a little better value. In driving a drift from the bottom of the shaft a boulder of granite was struck.

CRIPPLE CREEK CONSOLIDATED MINING COMPANY.—The Geneva mine on Gold Hill owned by this company and now being worked under a 12-months' lease by Tutt & Penrose, is now shipping the dump to the Cripple Creek sampler, owned by the lessees, with gratifying results. The mine when fairly in shape will give employment to 60 men. At present some 25 are employed.

GOLD DOLLAR.—This tunnel on Beacon Hill is now in a distance of 770 ft. At 860 ft. the vein should be intersected and if as valuable at that depth as at surface the shipments from this hill will no longer be irregular.

GROUSE.—This mine, on Bull Hill, under the receivership of Mr. Trevorrow, is being economically handled, and no shipments are being made which do not yield a profit. At present 18 men are employed (under the former management from 80 to 100 men) and all working on ore, yet the managers could not pay the labor account. Since the property passed into the receiver's hands the last four days of April showed a profit of over \$100, besides paying a royalty of 30%. A small lot of four tons sampled $9\frac{1}{2}$ oz. of gold.

INDEPENDENCE.—This mine is but meagerly developed, some 20 men being employed underground. Mr. Stratton two weeks ago closed all the mines he owned, the American Eagles and John A. Logan, on Bull Hill, and the Independence No. 2, on Battle Mountain, and reduced the force on the Independence. The sole reason for so doing was to see whether a certain 100-ton plant now being erected at the Independence can treat the low-grade ores for \$3 per ton. If the mill does all that it is claimed, it can do for the ores of the camp, Mr. Stratton will purchase the mill outright, but if not, the owners of the mill will remove their plant. The excavation for the mill is now completed, and a large force of carpenters are busy.

ISABELLA MINING COMPANY.—The Buena Vista, on Bull Hill, owned by this company, employs 105 men. The shaft has been sunk 500 ft. and with depth the value of the ore has increased in value twofold. A second boiler is being added to the hoisting works.

LAST DOLLAR.—Since it came in the hands of the owners this mine has been actively worked. Three steam hoists are running, but the owners contemplate closing one temporarily. A very important strike was made in the Dickson shaft this week. The mine employs 70 men. The lessees shipped over \$168,000 net in less than six months from this property above the 200-ft. level.

PHARMACIST MINING COMPANY.—At a depth of 600 ft. or the tenth level to-day commenced the starting of new drift. The first time that levels have been started in mineral for 370 ft. The shoot of ore is now proven for 55 ft. in depth and 75 ft. in length and still holds good.

PORTLAND MINING COMPANY.—Not much is doing at this property on account of the delay, it is stated, to the new hoisting works on the Burns shaft. The president of the company tells me that the machinery will be at work on May 10th, possibly by May 1st. Two weeks' delay was caused by the loss of a carload of stone for the engine bed.

REBECCA MINING COMPANY, LIMITED.—The C. O. D., owned by this company, is busy pushing their surface work to completion. The new pump, weighing nine tons, works very smoothly, and handles the present flow of 400 gals. of water per minute very easily from a depth of 360 ft., which in this shaft is the first level. The two new boilers, 125 H. P. each, will be at work within a few days, and after that increased shipments may be expected. The water all comes from the vein.

TRACHYTE.—A shaft has been sunk 180 ft., it being the intention to sink it 200 ft., and drive to intersect the ore-shoot found at a depth of 115 ft., and which for 20-in. wide averaged a little over \$100 per ton.

UINTA TUNNEL, MINING AND TRANSPORTATION COMPANY.—This company has pierced Battle Mountain, from the north or Arequa gulch, 420-ft. A four-drill compressor plant is now on the ground and an 80 H. P. boiler, with building large enough for a boiler of the same size. The total length of the tunnel is 3,000 ft.; the greatest depth is 830 ft., the line of the tunnel being about 50 ft. west of the Burns shaft on the Portland ground. The owners state that all the money is in bank to drive the tunnel the desired distance and not a share of stock has been sold.

GILPIN COUNTY.

(From Our Special Correspondent.)

APEX.—The State Engineer is surveying a new

road from this place, better known as Pine Creek, into Black Hawk. There is much talk of large shipments being made as soon as the snow disappears.

CONCRETE.—It is reported that the injunction applied for against the adjoining Gunnell mine has been granted.

WILLIS GULCH CONCENTRATOR.—As intimated in a former letter, this has proved a failure. It is now being dismantled, and the materials sold. Gilpin County affords a striking example of the non-success of small outlying mills, the saving in haulage being more than made up by extra cost in working. At one time there were a number of such mills, placed wherever there was a small stream of water available. To-day only two of these are in operation, the Kansas and Hubert mills at Nevada, owned respectively by the Gold Coin and Vendome Companies, and it is probable that even in these cases the ore could be treated more economically and to better advantage at the large custom mills in Black Hawk.

HINSDALE COUNTY.

PHILADELPHIA.—This mine has a good-sized force of miners employed and is shipping regularly.

SAN MIGUEL COUNTY.

CLINT.—On the Yougo, one of the claims of this group, Saw Pits under lease and bond to Carnart & Conklin good ore continues to be encountered. A tunnel was lately driven in a distance of 53 ft. through the lime contact, when a crosscut of about 11 ft. at right angles was driven and a good body of paying ore opened up says the Telluride Journal. The mineral encountered is the overflow, lying on top of the lime, from a large fissure vein which cuts through the property. The lessees of the group are drifting along the edge of the overflow on one side to ascertain its dimensions, and when a short distance further will drive another cross-cut to tap the vein and then drift through the chute on the opposite side of the fissure from where work is now in progress.

COMMERCIAL.—The ore in this mine improves in quantity and quality with development, and four cars are now being shipped weekly to the smelters.

GOLD KING.—About twenty stamps of the Gold King mill are dropping regularly on the rich gold quartz from this mine. The ore is said to average \$25 per ton on the plates. A winze is being sunk from the seventh level, the levels are being extended and large ore bodies are in sight.

LIZZIE G.—The ore body encountered recently in this mine is said to be one of the biggest ever discovered in the Saw Pit District. Shipments have commenced and will be kept up regularly.

IDAHO.

SHOSHONE COUNTY.

GOLDEN WINNIE.—Charles Swaine started his new 10-stamp mill on this mine recently. It is located about two miles below Murray, almost opposite the Golden King, also operated by Mr. Swaine. The ore of the Golden Winnie is of high grade.

KANSAS.

CHEROKEE COUNTY.

(From Our Special Correspondent.)

CHRISTMAS GIFT.—The Christmas Gift mine, on the North Empire lease, in which a three-fourth interest has changed hands, has a 20-ft. face of high-grade zinc ore which is improving. W. T. Trapp is superintendent. Last week they sold 155,340 lbs. of zinc ore and 3,170 lbs. of lead.

CROWN POINT.—On the North Empire lease is located the Crown Point mine, which will put in a blower and sink the shaft deeper. They will put in a set of steam jigs in a short time. Last week they turned in 117,270 lbs. of high-grade zinc ore.

NORTH EMPIRE MINING COMPANY.—This company's lease is the scene of much activity. The company has the new concentrating plant in operation. Mr. Charles De Graff has superintended the erection of the plant, which is equipped with an 80-H. P. boiler, 55-H. P. engine, two crushers, three sets of rolls, elevators and steam jigs.

The plant for the present is being run on chutes, but work on the ground will be resumed as soon as a tramway is completed from the new shaft and two steam hoisters put in place. The pump is run by a separate engine, as are also the dynamos which will furnish light for the mines and office.

PRINCE, SQUIRES & Co.—This property is on the Shelbina lease. They are drifting at 85 ft. on a large face of ore and last week sold 12 tons of crush ore.

MICHIGAN.

COPPER.

THE NORTHERN MINERAL MINE WORKERS UNION.—This association, which was the outcome of last summer's strike on the Marquette iron range and which now claims 20,000 members among the iron mines of Lake Superior, is arranging to organize the copper miners, 8,000 in number.

FRANKLIN MINING COMPANY.—At the annual meeting of the stockholders of this company, held in Boston on April 15th, 29,866 shares were represented and the old directors were re-elected. Superintendent Graham Pope was present and spoke briefly in relation to the Peninsula property, now the Franklin, Jr., purchased by the Franklin Company in November, 1894. Mr. Pope said that the company

had been handicapped in its workings by sand and water, and these conditions were about three times as expensive as sinking in rock. The Pewabic lode is now down 360 ft.; the last 100 ft. has constantly shown copper. The ore is sufficiently good to send to the mill, but not so rich as the old Franklin ore. Mr. Pope expects to reach the Osceola amygdaloid in about 30 days. If this is copper bearing the situation will be satisfactory. At present the company is sinking and opening. Stopping for product under any condition will not be done for probably a year, and dividends on Franklin will not probably be resumed until product from Franklin, Jr., is making. The old Franklin looks well and ought to be good for two years. The Calumet vein is 1,500 ft. from the present shaft and has been practically abandoned. If the new property develops as hoped, new stamping facilities will be necessary.

QUINCY MINING COMPANY.—A despatch from Houghton says that papers were served April 14th on Capt. S. B. Harris, agent of the Quincy mine, citing him to appear before the Federal Court to show cause why an injunction should not be issued restraining the payment of dividends from the surplus. The applicants for the injunction are Walter S. Milliken, of California, and Sarah E. Parker, of Rhode Island, who allege that at the time the 50,000 shares of scrip were issued that all money derived from the scrip and a surplus fund of over \$700,000 then on hand should have been devoted solely to improvements on the mine, mill and other property, but that contrary to such agreement the surplus and proceeds from scrip have been largely used to pay dividends. An injunction to prevent such further misapplication of the funds is prayed for.

TAMARACK MINING COMPANY.—A press despatch from Houghton says that the meeting called for April 13th at Hancock, by C. D. Hanchett, attorney for certain Tamarack stockholders, was attended by about 20 persons, some of whom were spectators merely. Only 662 shares of Tamarack stock were represented, and the largest holding represented was 100 shares, from that ranging down to two shares. There are 8,527 shares of Tamarack owned in the copper region according to the official reports, but careful estimates allowing for shares held on margin and purchase, made since the date of the last official report, place the local holdings at more than 12,000 shares. Owing to the small attendance an adjournment was taken until Friday evening, when an effort will be made to secure a large attendance. Resolutions concerning the present management of the Tamarack had been prepared by Mr. Hanchett and were read, but owing to the small attendance and lukewarm interest manifested no attempt was made to secure their adoption; they will be bought up at Friday evening's meeting.

MINNESOTA.

(From Our Special Correspondent.)

Ore shipments have begun from the mines of the Vermilion Range, and the Chandler mine is now loading 75 cars a day, the Minnesota 40 cars; the Oliver, Franklin and one or two other mines of the Mesabi are also shipping this week. Temporary ore train schedules have been put on both the Duluth & Iron Range and the Duluth, Missabe & Northern roads. Both roads are in excellent shape for handling business, with increased car facilities, new docks, double tracks, new motive power and additional vessel equipment.

BESSEMER STEAMSHIP COMPANY.—The 16 steel ships of the new Rockefeller ore carrying fleet will be named after prominent inventors. The boats will be called the Bessemer, Nasmyth, Siemens, Bell, Fairbairn, Ericsson, Fulton, Stephenson, Cort, Neilson, Watt, Holley, Corliss and Krupp, while the two whaleback barges will be rechristened Whitworth and Russell. Five of the ships, the Bessemer, Cort, Neilson and the two barges, will be ready at the opening of navigation, and will carry about 12,500 gross tons at a trip. The fleet is to be called the Bessemer Steamship Company. It will be able to handle about 2,000,000 gross tons of ore in a full season.

DULUTH & WINNIPEG.—D. M. Philbin, late of the Duluth, Missabe & Northern, has been appointed superintendent of the Duluth & Winnipeg. This means that the road will probably go into the possession of the Canadian Pacific, despite the opposition of the Great Northern interests, which desire it, and do not want it in other hands, and that the line will be extended both to the iron country and to the North Dakota grain section, and will form an integral part of the Canadian Pacific's main line.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

ALWORTH MINING COMPANY.—This company has been organized with M. H. Alworth, of Duluth, at the head, and capitalists from Detroit, Mich., and elsewhere with him. It owns lands in the vicinity of the Genoa mine of the Minnesota Company, and will begin explorations there at once. There is reason to expect good finds there. It also owns lands south of Hibbing which will be explored later.

CANTON IRON COMPANY.—This company will probably close down its hoisting works on May 1st with 150,000 tons in the stock pile. It will ship the stock pile clean during the season.

EVELETH EXPLORATIONS.—The Adams Exploration Company is starting a drill in 3, 58-17, adjoining the village on the east. O. D. Kinney and others are drilling on 8, 57-17, two miles south of the village. Fowler and Adams are exploring in 5 and 6,

and are still finding the continuation of the immense ore bodies they located some time during the winter.

FRANKLIN MINING COMPANY.—This company has closed down its Franklin shafts and for a time will operate the Bessemer and Victoria more heavily than before. Some 300 men are let out at the Franklin, but many have gone to the other properties of the management. Some 180,000 tons are in stock at the group.

LAKE SUPERIOR MINES.—At the Hull mine of this Hibbing group, an immense amount of water is still encountered, and it is not probable it will be gotten under control till the basin in which the mine is located is well dried out.

NORTH CINCINNATI AND HALE.—These mines have begun hoisting this week.

OHIO MINING COMPANY.—At this property two steam shovels will run this year, one mining and one stripping. About 150,000 tons of ore is the amount set out to win. The pit will be lighted by the Oliver electric plant.

OLIVER MINING COMPANY.—This company has begun mining at the Lone Jack property. Its explorations at the Saunty are now carried on with three drills. Two new Vulcan shovels are on their way from the builders. The Drake Stratton Company, which has a contract at the mine, has begun work actively. It is putting in an electric light plant at the pits.

PENOBSCOT MINING COMPANY.—This company has begun active work getting in shape to mine ore. It is said to have shown up 15,000,000 tons of ore, and the property cost only about \$150,000. Its deposit is of an excellent grade.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The output of ore was about the same as last week, but the sales were less by 297,740 lbs. of zinc and 251,280 lbs. of lead. The average price paid for zinc ore was a little less than \$21 per ton and silicate brought \$12.50 per ton, and there was left unsold about 1,000 tons of zinc ore. The price of lead ore was from \$16 to \$16.50 per 1,000 lbs. and there was left unsold about 500,000 lbs. of lead ore. The following was the turn-in from the different camps in the district: Joplin zinc, 1,082,790 lbs.; lead, 244,320 lbs., value \$16,810. Webb City zinc, 649,560 lbs.; lead, 28,380 lbs., value \$7,292; Cartersville, 1,366,290 lbs.; lead, 348,930 lbs., value \$20,101. Oronogo lead, 14,500 lbs., value \$214. Galena zinc, 2,140,000 lbs.; lead, 341,000 lbs., value \$24,716. Mt. Vernon zinc, 78,500 lbs., value \$785. Aurora zinc, 244,000 lbs.; silicate, 240,000 lbs.; lead, 88,000 lbs., value \$5,250. Alba zinc, 29,840 lbs., value \$298. Zincite zinc, 3,800 lbs., value \$38. District totals zinc, 5,434,780 lbs.; lead, 1,065,220 lbs.; silicates, 240,000 lbs.; value \$76,512.

ALLEN & Co.—On the South Forty lease Allen & Co. are drifting at 50 ft. on a good run of lead in soft red clay ground. They clean their ore at the Arkansas Belle steam plant and last week they cleaned up and sold 26,110 lbs. of dry bone and 25,890 lbs. of lead. This week they will sink deeper and take up a rich stope.

BAKER DIGGINGS.—Wise, Leach & Co., have leased and are operating the old Baker Diggings in Leadville Hollow. They are drifting at 50 ft. on a face of lead and jack in hard ground that is 6-ft. high and widens out the further they drift. Last week they made and sold 8,000 lbs. of lead and 10 tons of zinc ore and only used one hand jig.

KINMOUTH & Co.—On the Aldrich lot on the Rex land they are drifting at 70 ft. on a large face of lead and zinc ore in soft timbering ground, and last week on hand jigs they made and sold 14,000 lbs. of zinc and 8,120 lbs. of lead ore.

MYERS & COOPER.—On the Leonard land, in Chitwood Hollow, Myers & Cooper have their shaft down 62 ft. in hard ground and strong water. They are sinking their shaft on a drill hole in which they struck good pay dirt at 98 ft. and richer, down to 135 ft. when they stopped drilling. They have 18 lots and are drilling another hole on an adjoining lot.

NORSWORTHY, PORTER & STILLWELL.—On the Rex Mining Company's land the Norsworthy, Porter & Stillwell plant is mining steadily and handles over 300 tubs of dirt, which means over 7 tons of zinc ore and 3,000 lbs. of lead each shift. The plant is equipped with a 75-H. P. boiler, a 45-H. P. engine, a 14-in. crusher, 2 sets of rolls, a 4-cell rougher and a 6-cell cleaner. They are drifting at 84 ft. in two directions on a 16 x 16 ft. face of lead and zinc ores in open ground and no water. They flume the water that they use at the plant from the company's pump 1,500 ft. away. They have another shaft near from which they can hoist good pay dirt at 84 ft.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

FIRST NATIONAL.—A good output of silicate, amounting to 26,000 lbs., was made last week on the First National mine on the Rinker Homestead. The run of ore is not only quite extensive but also high grade, for which they receive the top price of \$12.50 per ton.

HALL LAND.—Messrs. J. N. Dalby and John Gally, of Sedalia, have made arrangements to put in a sufficient number of pumps to drain the territory known as the Hall land, where large bodies of mineral are known to exist, but which could never

be worked on account of the strong water. It is also the intention to drain and open up the Queen City land in the east part of the camp for a more thorough development.

MONTANA.

ANACONDA COPPER MINING COMPANY.—This company has declared a dividend of 62½c. per share, payable May 1st. This action of the New York directors has been ratified by the Board in Montana, as the law requires. It is proposed to declare dividends hereafter half yearly in April and October. The above dividend is at the rate of 10% per annum and will be distributed to the Montana company's stockholders through the exploration company, which issued a portion of the stock of the mine.

MADISON COUNTY.

WHITE PINE.—This mine at Pony has just made a good showing by a recent shipment of ore to East Helena. One car of gold ore from this property is said to have netted \$4,300. The vein from which it was taken ranges from 8 to 16 in. The mine is owned by Thomas Carmen, and he is reported to have taken out about \$100,000 by tunnel development alone. At no place in the property has a greater depth than 200 ft. been reached.

MEAGHER COUNTY.

BIG SEVEN MINING COMPANY.—This group of mines has become one of the leading producers of Nelhart, says the *Herald* of that city. They consist of 7 claims, named the Jennie Whipple, Ada, Silver Horn, Silver Leaf, Gold Hope, Red Horse and Emmett, all lying on the Snow creek side of Baldy and next west of the Benton group. The company has just received returns of its second shipment of 28 tons of ore, which are said to be very satisfactory. The ore is being taken from the Ada and from the Jennie Whipple. The former claim lies in the saddle between the two Baldies, and is opened by a tunnel 100 ft. deep. The Jennie Whipple is being developed by a tunnel which is now 400 ft. long on the same vein and reaching toward the chute of the Ada, which it will tap at a depth of over 500 ft. E. J. Barker is superintendent of works, and J. R. Fitzsimmons is secretary.

MISSOULA COUNTY.

IRON MOUNTAIN COMPANY.—This company will receive bids for building or running a tunnel at its mine in Missoula County up to May 10th, 1896; dimensions, 6 by 7 ft., length 5,600 ft., specification and conditions required will be furnished upon application at the office of the company at Helena, Mont. Mr. R. S. Hale is the president of the company.

SILVER BOW COUNTY.

BLUE BIRD MINING COMPANY.—Active preparations are now in progress to resume work on this property at Rocker. Men are at work making a general clean-up of the underground and surface workings, and it is reported by the *Butte Miner* that within a week a large force of miners will be on shift. The preparational work is also in progress and will soon be finished.

NIPPER.—Messrs. Mullins, Collins & Yeager, who are leasing this mine, which lies below the Sweitzer on the hill, have a shipment of 30% copper ore on the dump says the *Butte Miner*. At the 300-ft. level they are drifting for the eastern ledge, which is known to contain glance copper. On the way they are taking out ore that has averaged 30% copper. Also in the "raise" that is going up on this same level and drift they are extracting the same grade of ore.

SWETZER.—James A. Talbott, and others who have a lease on this mine, just north of the Anaconda and adjoining the Mountain View, are working some good developments. The shaft in the Sweitzer is down 200 ft. and they are now cross-cutting south to strike the well known ledge. Of the 75 ft. to go they are in 40 ft. and have mineral of a paying quality all the way.

NEVADA.

STOREY COUNTY—BRUNSWICK LODGE.

BRUNSWICK EXPLORATION COMPANY.—The superintendent's latest weekly official letter says: Shaft No. 1 has been sunk 16 ft. on the incline, passing through porphyry and quartz; total depth, 376 ft. 200 level. The north drift, which was started from the station, has been advanced 16 ft., passing through porphyry and quartz showing value; total length, 116 ft. At this point in this drift, 100 ft. from the station, we ran a west crosscut (No. 2) to the footwall, passing through quartz. Shaft No. 2—The west crosscut (No. 1), started from the south drift 80 ft. from east crosscut No. 1, has been extended through hard porphyry, seams of clay and quartz; total length, 55 ft. Gould & Curry Company's Tunnel—The main north drift has been extended 25 ft., passing through porphyry, clay and quartz; total length, 670 ft.

STOREY COUNTY—COMSTOCK LODGE.

HALE AND NORCROSS MINING COMPANY.—Preparations for resuming work under Superintendent Cronin are being made. It will take several days before the shaft will be repaired so that cages can be run to the 900-ft. level. Regular shipments of ore from the 220 tons accumulated in the surface bins began on April 10th. The Dazet mill at Silver City will crush this ore at the rate of 15 tons per day, and is expected to net the company a good profit.

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

CONSOLIDATED CALIFORNIA & VIRGINIA.—In the 1,650 level we have been making some necessary repairs and easing timbers in the south drift on the ninth floor—the first floor above the sill floor of this level. From this south drift at a point 60 ft. north from an east line from the Consolidated Virginia shaft, we have started an east crosscut which will connect with the old stopes now being worked upward from the 1,750 level. On the 14th floor from the south drift at a point 78 ft. in from its mouth and opposite the east crosscut, a west crosscut has been advanced 25 ft. through a quartz of low assay value, exposing the west wall. Work here has been stopped. 1,750 level—From the 14th to the 18th floor 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 89 tons of ore, the average assay value of which, per samples taken from the cars in the mine, was \$52 per ton. In working to the north from the above-mentioned upraise on the seventh and eighth floors, 56 ft. above the sill floor, we have followed a streak of ore varying from 2 to 3 ft. in width, assaying about \$27 per ton. 1,600 level—In working out to the southwest from the east crosscut run from the top of the upraise, 23 ft. above the sill floor of this level, at a point 230 ft. south of the north boundary line of the mine, we are following narrow streaks of ore and filling, which continue to appear and will pay to save. We have extracted from this point 33 tons of ore, assaying \$42.41 per ton. 1,000 level—West crosscut No. 2, started at a point in the north drift 550 ft. north from the Consolidated Virginia shaft station, has been advanced to a total length of 113 ft., continuing in porphyry with clay reparations and a slight seepage of water. The total extraction of ore for the week amounted to 122 tons, the average assay value of which, per samples taken from the cars when raised to the surface, was \$53 per ton.

OPHIR.—In the 1,000 level the west crosscut No. 1, started from the south drift from the shaft station on the sill floor at a point 350 ft. south of the south boundary line of the mine, has been advanced 33 ft., passing through porphyry carrying seams of clay total length 78 ft.; face is showing a slight seepage of water. Central tunnel—The south drift, 30 ft. above the sill floor, from the upraise started on the north side of the crosscut running west from the drift run northwesterly from the Mexican shaft, 56 ft. above the sill floor of this level, at a point 194 ft. in from the mouth of the crosscut, has been extended 8 ft. through quartz assaying from \$5 to \$8 per ton; total length, 17 ft. From the mouth of this drift we have commenced to work upward.

NEW MEXICO.

TAOS COUNTY.

(From our Special Correspondent.)

AZTEC.—The shaft on this claim is being timbered and preparations are being made to sink it 100 ft. deeper. It is now down 40 ft.

BESSEMER GROUP.—This group, comprising the Bessemer, Bessemer No. 2, and Lillian, is being worked by a party of Houston, Tex., capitalists, and is producing some quartz which assays well. The veins in their locality are contacts between granite and porphyry.

BOSTON GOLD MINING COMPANY.—The shaft on the Hamilton, one of the claims belonging to this company, is now down over 100 ft., and a crosscut is being run to cut the vein. Ore from the vein at only 40 ft. from the surface assayed well, and the vein was wide and well defined.

CLIMAX.—A fine body of sulphide ore has just been struck in the bottom of the winze on this property, which is down 145 ft.

DENMARK GOLD MINING & MILLING COMPANY.—Pumps, dump cars and track have been purchased and are at present being transported into camp by this company, with which to develop more efficiently the Denmark, the leading claim belonging to this company. The Denmark vein is from 4 ft. to 10 ft. wide. The ore is a fine white and light blue, and occasionally a little dark blue quartz, filled with iron pyrites and assays from \$15 to \$40 per ton. A recent mill run made on ore from this mine by the Denver branch of the Gold & Silver Extraction Company of America gave the following returns: Gold, 1.10 oz.; silver, 3.72 oz.; total value, \$24.24. A large enough amount of the stock of this company has been sold to raise the funds for putting in a mill, and three shipments of ore were made this week for mill runs by the McArthur-Forrest process, the Pelatan-Clerici process and concentration test. Whichever process proves the best for the treatment of the ore will be used in the mill which the company will erect this summer.

KEYSTONE AND COSTILLA MINING DISTRICTS.—There are nine stock companies now operating in these districts, and the prospects are becoming more encouraging as development goes on. Preparations are being made by at least three firms to put in mills; placer running is taking a new start, and in nearly all the deeper workings sulphide ore is being struck, seldom at less than 80 ft., and in all cases up to the present time the sulphide has run to exceed \$20 per ton and occasionally as high as \$300, the latter high assays, being from picked specimens, the average being from \$25 to \$40 per ton. Five or six outfits are working day and night.

LA BELLE GOLD MINING COMPANY.—This com-

pany, the principal stockholders of which reside in New York and Ohio, is running a crosscut tunnel to cut what is known as the Louisa vein, a very strong vein which has been traced for over two miles on the surface. The tunnel is now in 140 ft., and three shifts are driving it ahead as fast as possible. From calculations made by the manager, Mr. C. C. Cotton, the vein will be cut at about 360 ft.

WHAT IS IT.—This shaft is down 82 ft. Ore taken from the vein last week gave \$29 in gold.

NORTH CAROLINA.

CABARRUS COUNTY.

(From Our Special Correspondent.)

MARTIN WIDENHOUSE MINE.—This property is owned and operated by Martin Widenhouse and is producing about \$36 profit per day on a 5-stamp mill. The ore is sulphurets and galena carrying gold in combination and does not give up its value on first milling.

NUGGET GOLD MINE.—This mine, situated about 1½ miles from the famous Reid mine, is about to resume operations. It is on the same belt of country and has produced a large amount of nuggets. Mr. A. C. Mauney, of Gold Hill, will, it is reported, be in charge.

REID MINE.—This mine has been famous for its large nuggets and rich ore. On the 9th inst., while engaged in digging in the surface just below the old shaft house, a nugget was unearthed weighing about 25 lbs. Good judges estimate about 3 lbs. to be quartz, leaving 22 lbs. of gold. The mine is being operated by parties from Springfield, O., and is under the management of Dr. Lisle, of Georgeville, N. C. The largest nugget ever found at this mine weighed 37 lbs. Since then there have been found some 15 nuggets ranging in weight from 2 to 22 lbs. together with a large quantity of small dust and rich ore.

MONTGOMERY COUNTY.

(From Our Special Correspondent.)

GLEN BROOK.—At these mines 5 stamps continue to crush ore day and night.

SALLIE COGGINS.—Pittsburg parties have moved a plant, consisting of a 10-stamp mill and hydraulic plant, to the mine and it will be in active operation at once.

STEEL.—This placer property is being equipped with a new system of sluicing by Mr. Robt. Dimmick and associates, of Washington, D. C.

STANLY COUNTY.

(From Our Special Correspondent.)

BILLY CULP MINE.—This mine is being operated by Dr. Wood, of Denver, Colo., at present of Gladston, N. C. He is erecting a 3-stamp mill, which has just been received from Fraser & Chalmers.

PARKER MINE.—The vein struck on the 120-ft. level is still holding good in driving thereon. This vein on the surface was white quartz, containing nugget gold, and at the present depth it has changed its character entirely, being quartz with auriferous copper and iron pyrites.

OREGON.

BAKER COUNTY.

(From an Occasional Correspondent.)

BONANZA.—This property at Clifford is owned by the Geiser family, Mr. Albert Geiser being the manager. They have been operating the mine with a 10-stamp plant for five years successfully. At present they are adding 10 stamps, to the mill and expect to have the machinery in place, connections made and the 20 stamps dropping by April 10th, with enough ore in sight for a two years' run. The vein is a contact between slate and porphyry walls, from 6 to 20 ft. in width. They are working the ore by the free milling process, although it comes from 3 to 5% of sulphurets. The development has been by tunnel on the vein. The upper tunnel, 200 ft. below surface, has been driven in on the vein 1,400 ft. The lower tunnel, 325 ft. below surface, is driven in on the vein 1,500 ft. At present, all work is being done on the lower level, or through the lower tunnel. Including tunnels, crosscuts, air wings, etc., they have 6,000 ft. of work done. As soon as the owners get the 20 stamps dropping, they will drive a crosscut tunnel from mill level, which will tap the vein at 800 ft. below surface, or 475 ft. below the present lower workings.

DON JUAN.—This mine is 3 miles west of the Bonanza, which has been working successfully for over a year with a 3-stamp mill. It is owned by Kelly & Allen, who have just closed a deal with Colorado people for the property. I am reliably informed that the new owners will erect a 10 or 20-stamp plant immediately.

RED BOY.—This mine is 7 miles northwest of the Bonanza and has been working successfully for over a year with a 20-ton plant. In fact the present owners, Godfrey & Tabor leased the mine about a year ago, put up the reduction plant, and from the product have bought and paid for the property.

ROBINSONVILLE.—This old placer camp, 5 miles west of the Bonanza mine, has produced considerable gold in the last 30 years. The miners are beginning to give their attention to quartz mining. Several individuals have some promising prospects, but no reduction works as yet, and not very much development work has been done on the quartz veins.

PENNSYLVANIA.

ANTHRACITE COAL.

LEE COLLIERY.—William Connell and Dr. J. N. Rice, of Scranton, purchased this week from the Lee Coal Company the new colliery of the Lee Company at Newport, Luzerne County. The colliery has a capacity of 1,000 tons a day.

LEHIGH VALLEY COAL COMPANY.—This company has been receiving bids for the sinking of the new shaft below the Laurel Hill breaker at Hazleton. The contract was given out this week. About 80 men will be employed when work is commenced on the shaft.

WOODWARD.—By an explosion of gas at the Woodward colliery of the Kingston Coal Company, at Kingston, on April 13th, 5 men were burned, it is feared fatally. A fire occurred early in the morning in the red ash vein of the mine, and despite the hard work of a large crowd of men it spread rapidly. While the fire-bosses were making an investigation the explosion took place.

BITUMINOUS COAL.

ROCKHILL IRON AND COAL COMPANY.—Work has been practically suspended in one of the slopes of this company's mines at Robertsdale on account of a rush of water. The company has large orders for coal shipments.

TEXAS.

ROBERTSON COUNTY.

CALVERT COAL AND CLAY COMPANY.—This company is now opening up its coal property at Calvert, and expects to put in machinery shortly.

UTAH.

TOOELE COUNTY.

BLUE BELL MINING DISTRICT.—Considerable attention at the present time is being given to the Blue Bell Mining District, in the southeast corner of Tooele County, seven miles from Doremus, on the Tintic branch of the Tintic Railroad. The veins, which pitch to the east and run in a northerly and southerly direction, give values from a trace up to \$3 or \$4, and at a depth of a few feet the quality of the ore improves in a satisfactory manner, says the Salt Lake Herald. James A. Adams owns six claims in the district. On the Margarite Mr. Adams has a prospect hole about 4 ft. deep, the ledge being 7 ft. wide and the walls on each side being slate. At the surface the rock gave little more than a trace in gold, but at 4 ft. assays of \$62 in gold were obtained. The district is well watered, wood is plentiful and it is easy of access. Considerable development work is going on there, and many prospectors are flocking to the district.

MERCUR GOLD MINING AND MILLING COMPANY.—The first shipment from the Mattie incline on the Mercur was made last week. The ore body has steadily enlarged as work has progressed upon it, and it is now one of the largest uncovered in the property. It is reported that assays average over \$15.

VIRGINIA.

HENRY COUNTY.

EUREKA MANGANESE COMPANY.—This company has leased its manganese mine at Stanley to parties from Pennsylvania, who intend to work the property.

PIUTE COUNTY.

AURORA MINING COMPANY.—This company, whose property is the southern extension of the Dalton, is about to let a contract for 200 ft. on the tunnel which is now 65 ft. into the hill and from which an incline has been run 40 ft. on the vein. Assays upon recent samples returned 82 oz. silver and 1½ oz. in gold.

DALTON.—This property, at Marysville, says the Salt Lake Tribune, has a good body of ore in the upper workings, some of it running as high as \$16 in gold and 160 oz. silver.

DEER TRAIL.—This group was recently acquired by O. J. Salisbury. There is said to be considerable ore that will average from \$16 to \$18 per ton in gold and for the handling of which a mill will be erected early this spring.

STANDARD.—Michael Hennessy owns this group at Marysville, consisting of six claims, into which a tunnel 100 ft. has been driven. The vein, he says, is 20 ft. between walls, with from 6 to 8 ft. of ore in sight. The average of four assays recently made is \$21 in gold and 22 oz. of silver.

WASHINGTON.

BENTON COUNTY.

I. X. L. MINING COMPANY.—This company, of Clugston Creek, has struck a large body of iron ore at the end of the 150-ft. tunnel, and is erecting a 50-ft. shoot and ore buildings, preparatory to shipping as soon as the roads are in a passable condition.

FOREIGN MINING NEWS.

CANADA.

NOVA SCOTIA.

(From Our Special Correspondent.)

COAL.—The General Mining Association has large stocks of coal ready for shipping, and has completed a set of underground pumps driven by compressed air. The Dominion Coal Company has not banked any coal, but has all new pits in good order. The steamers of the company are being overhauled

in readiness for the summer's work. The contract of this company with the Grand Trunk is said to be 80,000 tons in excess of that of last year. The company is said to have contracted for 60,000 tons at Boston.

In Pictou County great dullness characterizes the Acadia Coal Company, while the International Coal Company shows an increase of 14,000 tons over the first quarter of 1895, and expects to increase its Montreal shipments. The strike at the Joggins mines has been settled by the men returning to work, practically at the company's rates. The Springhill mines show an increase this quarter of 38,100 tons over the corresponding period in 1895. Altogether it is expected that the season's sales will be in excess of any preceding year.

The Steel Company expects to have its furnace at Terrona relined in a few days and to resume smelting at an early date. The annual report of the Londonderry Iron Company was recently published, and is not encouraging. These works have been handicapped by the marked want of skill shown at their inception years ago.

GOLD.—Gold mining has been quiet as usual during the winter months. Dr. Maynard is engaged in testing a mine opened on the Waverly barrel quartz. The Richardson mine returned \$6,000 for its March work, from a low grade ore belt. A test crush from the Baker Hardman property at Chester gave 71 oz. from 38 tons. The Copeland mill at Stormont has been crushing steadily at an average of about ½ oz. The Fifteen Mile stream mill in its two last returns shows 663 oz. from 945 tons. As yet no new discoveries have been announced, but it is expected that the output will be larger than last year.

COPPER.—Some prospecting has been done on a copper ore property at George's River, Cape Breton, by some Swansea parties. The Coxheath Copper Company has been arranging for developing its surface plant this season. A discovery of antimony ore carrying a notable amount of gold is reported from Randon.

LATE NEWS.

A meeting of the stockholders of the Westinghouse Electric and Manufacturing Company will be held early in June, when it is proposed to increase the capital stock of the company from \$10,000,000 to \$15,000,000.

Aluminum wire is to be tried instead of copper at the Pittsburg Reduction Company's Niagara Falls plant, for the main power transmission.

According to the Oil City Derrick's report, the number of new wells completed during March, with their total daily production in barrels and the number of wells under the drill on March 31st, was as follows by districts:

	Completed Wells.	Production.	Drilling Wells.
N. Y., Pa., and W. Va.	499	8,055	1,054
Buckeye, O.	370	7,885	589
Southeastern Ohio	43	787	62
Indiana	86	2,090	143
Total	998	18,817	1,828

There was a considerable increase in activity during the month.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, April 17.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending April 11th, 1896, compared with the corresponding period last year.

	1896.		1895.
	Week.	Year.	Year.
Pennsylvania Railroad	69,069	979,989	1,088,137

PRODUCTION OF BITUMINOUS COAL, in tons of 2,000 lbs. for week ending April 11th, and for years from January 1st, 1896 and 1895:

	1896.		1895.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.	46,373	605,653	569,242
Barclay, Pa.	1,151	14,572	
Beech Creek, Pa.	143,134	943,396	846,372
Broad Top, Pa.	3,698	140,791	156,712
Clearfield, Pa.	85,511	1,433,112	1,341,130
Cumberland, Md.	70,592	936,194	858,451
Kanawha, W. Va.	275,370	1,149,000	1,017,941
Phila. & Erie	1,456	15,376	35,588
Pocahontas Flat Top		1983,551	996,192
Totals	327,515	6,311,945	5,820,658

† Week ending March 28th.
‡ " " April 7th.

	1896.		1895.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.	19,687	279,079	193,576
Pittsburg, Pa.	39,632	568,356	620,758
Westmoreland, Pa.	53,116	589,154	710,752
Totals	112,435	1,436,589	1,525,086

Grand totals 440,250 7,748,534 7,345,744

Production of coke on line of Pennsylvania Railroad for the week ending April 11th, 1896, and year from January 1st, 1896, in tons of 2,000 lbs.: Week, 79,806 tons; year, 1,336,447; to corresponding date in 1895, 1,687,133 tons.

Anthracite.

There has been no change in the dullness which has characterized the anthracite coal market for the past six weeks. New business continues slight, and

just now is chiefly confined to some hand-to-mouth orders or orders from points which have just been opened to navigation. The Hudson River trade shows an appreciable increase in volume, and the East has been sending in a few orders, but on the whole, trade was as quiet this week as it was last. From now until June buying will not be active, as there is very little need of stocking up at this moment.

Business having been so quiet, prices are without change and remain \$3.60 for stove, \$3.35 for egg and chestnut, and \$3.10 for broken; all net on board. Some of the better grades of coal have brought slightly higher prices owing to the fact that the greater part of the present demand was for such coals. We do not hear many reports of shading the "circular," but on the other hand it is the general impression that May prices will be higher.

Governor Morton on Wednesday of this week signed the Robbins Anti-Coal Trust Bill. It amends Chapter 716 of the laws of 1893 by adding the following sections to it:

Every corporation, or officer thereof, that shall make any contract, arrangement or agreement, or shall enter into any combination or conspiracy for the purpose of restraining or preventing competition in the supply or price of any article or commodity in common use in this State, or with intent to restrict or restrain trade or commerce in this State, or that shall attempt or actually conduct any business in this State pursuant to any such contract, arrangement, agreement or combination, wherever the same may be made, or shall in any manner in this State engage or aid in carrying out or executing the agreements contained in any such contract or arrangement, wherever the same may be made, shall be deemed guilty of a misdemeanor. The Attorney-General may, in addition to the power now conferred by law, bring an action in the name and in behalf of the people of the State against one or more trustees, directors, managers, or other officers of a corporation, or against any corporation, foreign or domestic, to restrain them or either of them from carrying out in this State any such contract, combination or business in this State, where such contract, combination or business is threatened, or there is good reason to apprehend that the same may be made.

This act shall take effect immediately.

The officers of the anthracite companies are apparently not much disturbed by the passage of this bill. They claim that they have entered into no combination, legal or otherwise, and that they do not come under any provisions of the bill. There is little doubt, however, that but for the Anti-Coal Trust agitation the sales agents would still be holding monthly meetings and "recommending" certain tonnages for the month. It is to be presumed that the officers of the coal companies will continue, as they have during the past two months, to discuss the trade "informally," and probably they will also continue to agree upon what amount of coal the market will take each month. It is indeed difficult to see how they can be brought into court or be compelled to submit to an investigation by a committee of the legislature.

Bituminous.

The soft coal trade is dull, though this is natural at this time. There is a slight transient demand, but most of the shipments being made are on old contracts which have not yet expired, and which run, as we stated in last week's issue, into May and June. The contractors for yearly supplies are slow in making engagements, though most of the producers have some season contracts on their books at the new "Association" figures, one producer stating that he had 40,000 or 50,000 tons contracted for at these terms, with more in view.

The old rumors concerning two or three of the larger railroad contracts are still going the rounds, though they are discredited to a great extent. A few reports of cutting have been traced to certain middlemen and others who have split their commissions to take business, and from present indications they will have difficulty in buying the coal to supply on these contracts. From all we can hear the "Association" is holding its own.

Some attention has been given by the soft coal trade to the Anti-Trust law of New York State, though it is not thought that it can affect the "Association," which was formed in another State.

Shipments to points east of Cape Cod are slightly improved, and Sound business has fallen off to some extent. New York harbor trade remains comparatively active. Business local to the shipping ports is dull. All rail trade is quieter than usual. Transportation from mines to tide is good, as might be expected with the reduced shipments, and most of the unshipped coal is standing at the shipping ports. We hear of no blockades or side-tracking of coal on any of the lines. The car supply is excellent, and cars are being furnished to the usually embargoed points off the main lines.

In the coastwise vessel market vessels are in better supply than demand, and naturally freights are weak and declining, vessel owners and captains having to make charters at present current rates, which the shippers are not inclined to accept. The warm weather continues to bring vessels out of winter quarters, and their effect on the market is noticeable. We quote nominal rates of freight as follows from Philadelphia: To Boston and Salem, 70c.; Portland and Portsmouth, 70@75c.; Providence, New Bedford and Sound ports, 60@65c.; Wareham, 80c.; Lynn, 90c.; Newburyport, 85c.; Dover, \$1.20 and towages; Saco, \$1 and towages; Bath, 75c.; Gardiner, 85c.; Bangor, \$1; Newport News, 5c., and Norfolk and Baltimore 10c. higher.

The "Association" prices remain as follows: E. o. b. Philadelphia, Norfolk and Newport News, \$2.35; Baltimore, \$2.28; New York Harbor shipping ports, \$2.80; alongside New York Harbor, \$3. There is a

15c. differential in favor of Clearfield and Beech Creek coals.

NOTES OF THE WEEK.

The National Miners' Association was in session at Columbus, O., this week. On April 16th resolutions were adopted thanking the retiring secretary, P. McBride, for his services; and condemning the New York & Cleveland Coal Company for its alleged bad faith in dealing with the miners. A resolution to organize the anthracite region was referred to the executive committee. P. H. Penna was re-elected president; Cameron Miller, of Massillon, vice-president, and W. Pearce, of Corning, secretary-treasurer. The following executive committee was chosen: H. L. Davis, Ohio; Jas. O'Connor, Illinois; Andrew Stevenson, West Virginia; Fred. Ditcher, Ohio; John Fahey, Ohio; and W. U. Webb, Kentucky.

Buffalo, N. Y.

April 16.

(From Our Special Correspondent.)

Warm, sunshiny weather, with occasionally heavy rains, have prevailed in this section of New York State for several days, and as a result the ice at this end of Lake Erie is weakened and honey-combed. Navigation may be resumed in a few days if no storm comes up to drive the ice into the bay. Large fields of ice are passing down Niagara River.

This atmospheric condition has not been conducive to activity among our anthracite coal dealers. Trade is very dull for the supply of local nearby points and for Canada. No changes in quotations.

Bituminous coal continues in light demand; what orders are given are for small lots. The schedule of prices has not been changed for some reason inexplicable to outsiders.

Times are lively on the river. Vessels are being fitted out and engines and machinery overhauled, and much painting and caulking are under way. There is a general hustling.

Items of news are scarce. Navigation is open on Lake Ontario. A vessel arrived at Oswego from Toronto last Monday, the 13th.

The ice situation may be summarized thus: At Port Huron warm weather softened ice, and large fields of it have been driven up the lake. At Mackinaw the ice is being blown out of the Straits very fast by a strong southwest wind. There is no trouble in vessels entering or clearing at Duluth. All Lake Erie ports are accessible excepting Buffalo. Lakes Michigan and Huron ports can be reached with little or no difficulty.

The question of lake freight remains unsettled, but vessel men and shippers will doubtless come to an understanding this week. Coal shippers at Buffalo are said to be holding off until May 1st.

The Delaware and Hudson Canal Company wishes to sell its dock and coal trestle property in Buffalo, as it is not conveniently situated for handling coal to the large boats that are now in the trade. An arrangement has been made by the company with the Lehigh Valley Company to use its docks, etc., from this time out.

Messrs. Hanna & Co. will run the W. L. Scott ore and coal docks at Erie, Pa., this season.

The Welland Canal will be opened on or about May 1st.

Electricity from Niagara Falls will be furnished to Buffalonians on the 1st of June, 1897. Long expected, but coming at last!

LATER.—Telegram just received states that three vessels of the Chicago fleet passed through the Straits of Mackinaw this morning.

Weather warm all over the Lake districts.

Pittsburg.

April 16.

(From Our Special Correspondent.)

Coal.—The river shipments were moderate. The fact is, for some time past, shipments have been very close to production, keeping the pools and harbor bare. At the same time the last three months' record beats all previous records. Most of the pits on the Monongahela and Youghiogheny are running full. In the railroad district there has been no change of any kind. Uniformity is still being talked about, and the mining rates are unchanged. The lake trade opened with a big boom in the Pittsburg railroad coal district. The early opening was unlooked for, as 10 days ago leading lake shippers expressed the opinion that the opening would be late this season. Big shippers are now filling lake orders and as a result every mine on the Wheeling division of the Baltimore & Ohio road, and other important sections of the Pittsburg district, is now running full, as a rule, many of the smaller concerns having already received orders to help to supply contracts and furnish a certain number of cars daily for the lakes.

Coal miners are scarce. Lake trade shipments cause a demand for diggers. During the depression in mining, many miners left for other parts of the country, hence there is a scarcity of men in the Pittsburg district.

Connellsville Coke.—The trade is evidently feeling the effects of the steel combine and is exhibiting more life everywhere and giving promise of a better demand. Nearly 500 ovens were blown out last week, but at the same time the ovens in blast made a much better average run and production and output of the region were both increased. The four-day plants of the week previous had all a five-day run, and a number of the five-day ovens are put on the six-day list. The week closed with an increase in production of 7,677 tons and a gain in demand of 669 tons. This increase in production and

output are of course light, but they are taken as encouraging and give grounds for expectation of a better coming trade. Reports from the region show 11,565 ovens in blast and 6,622 idle. In the running order 4,503 ovens made six days and 6,968 ovens five days, an average of 5.33 days as against 5.23 days the week previous. The shipments of coke from the region for the week amounted to 6,796 cars. The shipments for the week were distributed as follows: To Pittsburg and way points, 2,131 cars, increase 50 cars; to points west of Pittsburg, 3,573 cars, decrease, 3 cars; to points east of Everson, 1,092 cars, increase, 2 cars.

Shaughai, China.

March 13.

(Special Report of Wheelock & Co.)

Coal.—Owing to large arrivals of Japan coal, stocks have further increased, while the existing demand has not been in any way equal to the supply, and we have not heard of any transactions worthy of notice. There is little or nothing doing in Cardiff. We have heard of a shipment of American anthracite being offered to arrive, but there is practically no demand, present stocks being ample for requirements. Business in Sydney Wollongong for the moment is dull, and though there is a slight demand, prices offered do not meet the views of holders, but we anticipate a satisfactory settlement. Quotations are as follows per ton: For American anthracite, 9 taels; Welsh Cardiff, 10.50 taels; Australian Wollongong, 9.50 taels. For Japan coal we quote 7.75 taels per ton for Takasima lump, 4.25 taels per ton for Namazuta lump, and 3@3.25 taels per ton for other sorts.

Kerosene Oil.—There has been considerable excitement during the last few days owing to stocks having become very low, in fact barely sufficient to cover the existing demand for delivery, and consequently a considerable rise has been asked by holders of Devoe's, as much as 1.80 taels having been paid for spot cargo. An arrival of some 80,000 cases of Devoe's has added to our stocks, but this cargo had previously been sold "to arrive," so that it cannot be said to have relieved the demands on importers for spot cargo. Stocks are now estimated at 215,000 cases Devoe's and 100,000 cases Batoum.

We quote as follows per case: American, Devoe's, 1.77½ taels; Russian Batoum, 1.65 taels, and Batoum bulk, 1.57½ taels; Langkat, 1.60 taels.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, April 17, 1896.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From Jan., '95.		From Jan., '96.	
	Apr 19, 1895.	Apr 17, 1896.	Tons.	Tons.	Tons.	Tons.
Anthracite.	34	20,097	44	20,256	331,396	498,098
Coke.	119	132,360	139	170,370	2,193,644	2,627,139
Charcoal.	18	3,859	13	5,200	68,812	80,440
Totals.	171	156,316	196	195,826	2,593,852	3,205,677

The iron market is not in any better or more active condition than it was a week ago. The "fixing of prices," which was to be the signal for renewed activity, has not had the expected effect. The sales of finished material are not increasing, and manufacturers are still doubtful as to the effect higher prices may have on their sales. The general impression is that any considerable increase will materially limit trade. With matters as completely in the hands of the steelmakers' combination as they are to-day, many billet-buying concerns are seriously considering whether it would not be better to shut down.

So far as prices are concerned the rates fixed by the combination have had very little actual effect on the market as yet. There are a good many old contracts unfilled, of course at lower prices, and until these are out of the way it can hardly be said that the change has taken effect. Buyers do not seem to be in need of immediate supplies and transactions in billets for future delivery have been absent. In the few cases where small orders have been placed they have been taken by brokers and are for present use.

There continues to be a good deal of talk over the expressed intention of the combination to force all brokers and middlemen out of the trade. This would be, theoretically, a good thing, provided the manufacturers were willing to give buyers the benefit of the profit which now goes to the intermediaries. The saving in this case, however, is to be added to the pool profits—if the pool succeeds in its object, which is doubtful. Practically the broker and the middleman have their uses and it is quite likely that they will survive the present crusade, as they have many previous ones which might be recalled. The reorganization of the trade involved in such a change is not to come just yet.

Meetings of the Sheet Manufacturers, of the Tinplate Manufacturers and of the Wire Makers have been held in Pittsburg and Cleveland this week, but no definite results were reached and further conferences are to be held. At all of these meetings the steel agreement was, of course, the topic under consideration, and the object was to devise some plan of adjusting the trades to the higher prices of billets and rods. The tin-plate people, who are in session again to-day, are especially disturbed, but the nail-makers are also uneasy over the situation. In Pittsburg there was a good deal of talk about new basic open-hearth plants to be built.

Alabama gray forge iron is now being offered in

Pittsburg at 40c. or 50c. a ton below the price of local iron of the same grade, and it is said that a good deal has been sold.

NOTES OF THE WEEK.

The Cumberland Steel, Iron and Coal Company was lately incorporated at Norfolk, Va., for the purpose of building iron works in or near that city. The intention is to work largely for export trade, which the projectors believe can be built up, especially as cheap coal and ore can be obtained there close to a good harbor and shipping.

New York.

April 17.

Except in pig iron and structural material the local market has been rather quiet. The rush to buy, in anticipation of higher prices, which some people expected on the announcement of the steel pool arrangements, has not been apparent. Nothing new has been developed by threats of increased quotations, and it is pretty clear that the market is not in a condition to be forced. This fact was plainly apparent to close observers weeks ago, but the large class of people who have been brought up to believe in what might be called the incubator plan of making business will learn only by experience—and some of them not even in that school. High prices mean no business now and for some time to come.

Pig Iron.—The market is fairly active, chiefly on small orders, and quite strong. There is less talk of lower prices and less disposition to skirmish for business. The talk of a break among the Alabama iron men turns out to be incorrect, though the agreement is still somewhat indefinite. It is understood, however, that several companies have negated a proposal made by the Tennessee Coal and Iron people for an increase of 25 or 50c. per ton. It was believed that such a move would reduce sales too much. A good deal of iron is going up the North River, and more will go up as soon as the canals open.

We quote for Northern brands as follows: No. 1 foundry, \$12.75@13.25; No. 2, foundry, \$12@12.50; gray, \$11.25@11.75. For Southern iron prices are: No. 1 foundry, \$11.75@12.35; No. 2 foundry, \$11.25@11.75; No. 1 soft, \$11.25@11.75; No. 2 soft, \$11@11.50; forage, \$10@10.50. All prices are for tide-water delivery.

Cast-Iron Pipe.—New contracts have about stopped coming in, but the foundries are well supplied with work, and are not hunting for orders.

Spiegeleisen and Ferro-Manganese.—There has been more business and higher prices are talked of, but no sales are known to have been made over \$47.50 for foreign. Domestic ferro is quoted at \$49. Pittsburg, but none has been sold here. Spiegeleisen is nominally higher, say \$19.50@20.50, with no sales.

Steel Billets and Rods.—The quotation fixed by the pool is \$21.75 per ton, New York, but there have been no transactions, and nobody here seems to want billets just now. Rods are nominally \$27@27.50, with no sales.

Merchant Iron and Steel.—Small orders are coming in better, but large transactions are scarce. No important changes are noted, but it is said that bars, both common and refined, can be had a little below quoted prices by good customers. We quote for common bars, 1 1/2@1 1/4; refined bars, 1 1/2@1 1/4; soft steel bars, 1 3/4@1 1/4. Other quotations are as follows: Open hearth machinery steel, 1 5/8@1 1/2; steel hoops, 1 5/8@1 1/2; steel axles, 1 5/8@1 1/2; links and pins, 1 5/8@1 1/2; tire steel, 1 5/8@1 1/2; spring steel, 2 1/8@2 1/4. Rivets are 2 1/2@2 3/4 for steel, and 3@3 1/4 for iron.

Plates.—Business is more active, and there has been quite a demand for plates. One good sized order from Paterson is noted, and another from Bridgeport; the balance has been in small orders. There is no material change in prices, but less talk of shading to secure orders than there was a few weeks ago. Universal mill plates are 1 1/4@1 1/2. For steel plates we quote: Tank, 1 1/4@1 1/2; boiler shell, 1 1/2@1 1/4; good flange, 1 1/2@1 1/4; firebox, 2 1/8@2 1/4. Charcoal iron plates are 2 1/2@2 3/4 for shell, 2 7/8@2 3/4 for flange, and 3 1/2@3 3/4 for firebox.

Structural Iron and Steel.—No large contracts are noted, but there are plenty of inquiries, and no lack of business is feared. There is some talk of higher prices, perhaps to hurry buyers, but up to date there is no change. We quote for angles, 1 1/4@1 1/2; channels, 1 1/2@1 1/4; tees, 1 1/2@1 1/4; beams (up to 15-in.), 1 1/2@1 1/4 for large lots and 1 1/4@1 1/2 for small orders.

Steel Rails and Rail Fastenings.—Rails are unchanged at \$28 per ton at mill, or \$28.75 at tide-water for standard sections. Girder and street rails are \$28@32 per ton at mill, according to section. The West End Street Railroad Company, of Boston, has contracted with the Pennsylvania Steel Company for all the rails it will need this year. The quantity will be from 10,000 to 12,500 tons.

Rail fastenings are quiet and unchanged. Quotations are: For fish and angle-plates, 1 1/2@1 1/4; spikes, 1 1/2@1 1/4; bolts, 1 1/2@2 1/4 for square nuts, and 2 1/2@2 1/4 for hexagon nuts.

Scrap Iron.—No heavy transactions are reported in foundry scrap, but the supply is not large. We quote \$9@10.50 per ton, according to size and quality of lots.

Some old iron rails have been offered in this market at \$14, Newark or Jersey City delivery. It is

said that the seller offered finally to take \$13.50, but found no buyers.

Buffalo, N. Y.

April 16.

(Special Report of Rogers, Brown & Co.)

While the pig iron market in this vicinity has been rather quiet, several good-sized orders have been placed for Northern iron for reasonably early delivery. As a general thing, however, both consumers and producers of foundry iron are awaiting the action of the ore men. As soon as the price of non-Bessemer ore is set for the season and the cost of Northern iron settled, the local furnaces will feel more like selling for extended delivery. Consumption of foundry iron seems to be holding its own at least, if not increasing. The scarcity of cast scrap has caused some foundries to discontinue its use and others to substitute a close grade of pig iron, both of which increases the consumption of pig iron. Lake Superior charcoal is quiet, sales being confined to small lots to piece out until navigation opens. Our quotations below are on the cash basis f. o. b. cars Buffalo: 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; Ohio strong softener, No. 2, \$13; Jackson County silvery, No. 1, \$15.50; Southern soft, No. 1, \$12.40; Southern soft, No. 2, \$11.90; Hanging Rock charcoal, \$18; Lake Superior charcoal, \$14.

Cleveland, O.

April 16.

(From Our Special Correspondent.)

Iron Ore.—Big buyers have not yet made purchases of ore for 1896. The sales agents, since the prices were formally announced last week, have made quite a number of small deals for the new ore, but in no instance for any considerable amount. The aggregate sales, it is estimated, are not above 250,000 tons at the outside. The ore men are not courting business, nor making strenuous efforts to place the product but are calmly waiting for their customers to announce a readiness to negotiate. The sales made were at the schedule of rates announced last week, based on \$4 for standard Gogebic Bessemer, and were for a variety of grades, desired by purchasers for early delivery to complete mixtures.

All told perhaps 500,000 tons of ore have been covered for lake transportation, but most of these charter contracts were made last fall. It is many years since the opening of navigation has been so close at hand without more lake charters having been effected. The shippers express an unwillingness to charter vessels before the sales of ore are made. The situation as regards season charters is unchanged. Vessels are holding off for \$1.10 from the head of the lakes and the shippers, while not looking for boats, are willing to pay \$1.

The first wild charters were made yesterday. A half dozen or more boats were put in to load ore at Escanaba for Ohio ports at 55c. This is considerably lower than the vesselmen expect to get on season charters from that port. The present wild rate is based on the low grain rate at Chicago.

Pig Iron.—The local pig iron market is firm, but not active. The price of Bessemer pig holds steady at \$13.75 Cleveland. There are few buyers in the field. The strength of the market is due chiefly to the increased cost of production and at the present scale of prices there is said to be a very narrow margin of profit. The dullness of the market is attributed in part to the elimination of the speculative element. Purchasers are making requisitions upon the furnacemen for only the supplies necessary to fill actual orders at hand.

Southern irons have nominally advanced 25c. during the past week, but the few sales that are being made are at a slight concession from the new figures and by the small producers who are not in the agreement which fixes the scale for these products. No. 1, Foundry, Southern is nominally \$12.15; No. 2, \$11.65; No. 3, \$11.40; No. 1 soft, \$11.65; No. 2, \$11.40; foundry forage, \$10.80; gray forage and mottled, \$10.75. Northern strong is quoted at \$13, No. 1 and \$12.50 No. 2. Lake Superior Charcoal is \$13.50.

Pittsburg.

April 16.

(From Our Special Correspondent.)

Raw Iron and Steel.—There has been during the week but little change as relates to prices or demand. Iron and steel conditions have been unsettled by a feeling of uncertainty as to the effect of the steel pool upon prices of finished products, but the general market has been firmer and more activity was perceptible at most points. Pig iron has been sold more freely in the leading markets; the April figures show practically little change in production of pig iron, but a continued accumulation of stock which increased last month over 60,000 tons. It is undeniable, however, that a more confident feeling prevails all through the trade now that the price of raw material has been fixed and the position of the large mills determined. The suspense is now over, the hurried buying of foundry and Bessemer that followed the announcement of the combination is finished and the trade is expected to settle down. Pittsburg furnaces and those adjacent to this city continue to run steadily; some of them are well sold up while others still have some iron for sale.

Some important changes in transportation rates went into effect on Monday, to continue until September. All the iron products now carried by the railroads for 17 1/2c. per 100 lbs. will hereafter be carried for 15c. per 100 lbs. Under the old rules, still in effect, iron and iron products in less than carloads were in Class 4 of the rates; iron in carloads was in the fifth class. Under the new class

rates the same products will be put in the sixth class, making a reduction of 50c. a ton.

At Youngstown, O., the Ohio Steel Company resumed operations on Monday in full, the old rate of wages being paid. The mill runs night and day; when in full operation employs about 800 men.

Latest.—The market was firm but dull. Consumers seem to have a fair supply of stock on hand and appear to think they will be able to obtain all they want when required for replenishing. The latest quotations are Bessemer \$13.50@13.75. April to July Bessemer quotations in the valley, \$12.75@12.85. Billets show demand light with sales \$19.50@20. Gray forage and foundry irons quiet, with prices unchanged.

COKE SMELTED, LAKE AND NATIVE ORE.	Tons.	Cash.
1,000 Billets, May, at mill.....	20.10	
700 Billets, prompt, at mill.....	20.20	
SKELP IRON.		
1,000 Sheared, Pitts. \$1.50 4 m.		
850 Wide grooved, Pitts.....	1.30 4 m.	
700 Narrow grooved, Pitts.....	1.30 4 m.	
SKELP STEEL.		
800 Sheared, Pitts. \$1.40 4 m.		
750 Wide grooved, Pitts.....	1.20 4 m.	
600 Narrow grooved, Pitts.....	1.20 4 m.	
MUCK BAR.		
1,500 Neutral Apr., May, Pitts....	\$22.00	
STEEL WIRE RODS.		
2,000 5-gauge, at mill, Pitts.....	\$26.00	
SHEET BARS.		
2,500 At Maker's mill, Pitts.....	\$22.00	
BLOOMS, BILLETS AND BAR ENDS.		
650 Billets and bloom ends, Pitts.....	\$14.75	
SPELTER.		
50 Prime, Pitts....	\$4.00	
SCRAP MATERIAL AND OLD RAILS.		
500 Iron rails.....	\$16.00	
400 Steel rails.....	13.65	
500 Car wheels, gross, 12.50 gross.....	15.00	
400 Coil spring scrap, gross.....	14.50	
200 No. 1 railroad wrought scrap, net.....	13.00	

Philadelphia.

April 17.

(From Our Special Correspondent.)

Pig Iron.—Pig iron production will soon exhibit a sharp decline, according to all present signs, but the decrease will apply chiefly to ordinary makes. Special brands are well sold up, standard makes are in moderate request; at strong prices, especially for forage. Foundry men have been buying liberally for awhile and mill men are now coming in but they will go carefully, into summer deliveries. The average price for No. 1 is \$16; for No. 2 \$12.50, for forage \$11.25; Standard Bessemer is dull at \$13, at furnace.

Steel Billets.—The statement made that billet requirements have been amply covered up to midsummer is not admitted to be a correct presentation of the market this week. Some liberal buying has been done. What consumers will do should demand improve sharply they do not say. Considerable steel is under contract for future delivery.

Skelp Iron.—Grooved was quoted to-day at \$1.25; sheared at \$1.40; not much business.

Bars.—Shadings were quietly made late last week, which resulted in good retail orders this week at about \$1.10 at mill for a fair make of iron. The bar iron business is quiet.

Sheet Iron.—Every day brings a moderate business to mills and stores are fairly busy in a retail business. Stocks have been accumulated in certain numbers of heavy sheet in expectation of an active early summer demand.

Wrought Pipes and Tubes.—In some respects there is a better feeling. New business is being quoted for to day and manufacturers look for a sharp improvement in business for early summer delivery. The local demand is spoken of as fair.

Merchant Steel.—The various products coming under the head of merchant steel are meeting with a moderate demand.

Plate and Tank.—There is a steady run of small orders for local and nearby delivery. Each week develops new expectations. The local demands are larger than they have been for three years, but in neutral territory work is harder to get and the margin in some of it is purely nominal. Tank has sold quite well at 1 1/2 quoted. Universals are 1 1/2; shell, 1 1/2; flange, 1 1/2; firebox, 1 1/2.

Structural Material.—There is more work in local channels in sight than in four years and it is coming along as fast as can be expected and no "contingencies" are behind it. The projected office

building work will all be pushed through this season and when the contracts are placed, it will give the market the appearance of activity. Angles are 1.50; beams and channels 1.60@2.00 according to size.

Steel Rails.—Girder rails at \$28@30 according to size.

Old Rails.—Iron are quoted at \$15; Steel, \$13.

Scrap.—Railroad is bought this week at \$14. Car axles, \$17.50. Heavy steel scrap is light in supply.

METAL MARKET.

NEW YORK, Friday Evening, April 17, 1896. Gold and Silver.

Prices of Silver per Ounce Troy.

Table with columns for April, St. Ex., London, N. Y. Cts., Value of sil. in \$., and corresponding values for 11, 13, 14.

Since the completion of the order on French account, silver has receded and declined to 30 1/2 d. At this point there were good buyers and in expectation of another order in a few days the price advanced to 31d. with several unfilled options in the market.

The United States Assay Office in New York reports the total receipts of silver at 117,000 oz. for the week.

Gold and Silver Exports and Imports.

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

Table with columns for Specie and bullion, In ores, Total excess, Exp. or Imp., and values for GOLD, SILV., and 1895.

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 April 17th, 1896, and for years from January 1st, 1896, 1895, 1894, 1893 and 1892:

Table with columns for Gold, Silver, Total Excess, Exp. or Imp., and values for We'k, 1896, 1895, 1894, 1893, 1892.

Of the gold exported \$700,000 went to Germany, and the remainder to the West Indies; of the silver \$137,000 went to France and the balance to London.

Average Monthly Prices of Metals

In New York since January 1st, 1896, and for the corresponding periods in 1895, 1891, 1893 and 1892, in cents per pound.

Table with columns for Month, 1896, 1895, 1891, 1893, 1892, and rows for Copper, Tin, Lead, Spelter.

FINANCIAL NOTES OF THE WEEK.

The statement just issued by the Treasury Department shows the amount of gold coin issued \$588,743,303, of which there were in the Treasury at the date of the return \$142,831,047, leaving in circu-

lation \$445,912,256, as against \$479,493,599 at the same date in 1895. This return is looked upon with satisfaction by bankers, who were somewhat apprehensive of the steady drain upon our gold production and reserves during the past year, and who were of the opinion that the last issue of \$100,000,000 4% Government bonds would deplete the home supply of gold to a much greater extent than it has evidently done.

The last returns made by Comptroller Eckels on the financial position of the national banks of the United States would seem to show that they are in a very prosperous condition. At the beginning of March there were 3,699 national banks from which he had received complete returns, the aggregate figures of which show \$1,951,344,781 in loans and discounts, \$192,036,933 in stock and securities, and a lawful money reserve of \$337,259,922.

The attempted deal by trickery between the silver section of the Senate and House, and certain Philadelphia leading men of business assuming to represent all the banking and commercial element of that center was very promptly repudiated in a formal manner at a more representative meeting, and at a meeting of the Pennsylvania Bankers' Association held on Wednesday, the following resolutions were passed:

"Believing that under the laws of trade a sound system of currency is necessary to commercial and business prosperity, and that any departure from such a system is a compromise of principle and a cause of financial disaster."

The following statement from the Bureau of Statistics of the Treasury Department shows the foreign merchandise trade of the United States for March and the nine months of the fiscal year from July 1st to March 31st.

Table with columns for March, Nine months, 1895, 1896, 1894-95, 1895-96, and rows for Exp'ts, Imp'ts, Excess, L., and Total excess of exports.

The detailed statement of the gold and silver movement will be found in the usual place, at the head of this department.

Shipments of specie from San Francisco in March included \$1,046,291 silver and \$6,888 gold to China, \$162,700 silver to Japan; \$5,000 silver and \$100 gold to Honolulu; \$500 silver and \$500 gold to Central America; \$1,066 silver to Mexico; \$1,117,665 gold to New York; a total of \$1,215,557 silver and \$1,125,153 gold.

The amounts and descriptions of specie shipped in the first three months of the year compare as follows:

Table with columns for 1895, 1896, and rows for Silver bars, Mexican dollars, Port coins, Silver coin, Gold bars, Gold coin, Gold dust, and Total.

The destinations of the above shipments were as follows:

Table with columns for 1895, 1896, and rows for Hongkong, Shanghai, Japan, Central America, Honolulu, Mexico, New York, and Total.

There was quite a falling off in the movement of Mexican dollars in March. There was also a marked decrease in the shipment of gold coin to New York in March, the total for February being \$3,448,689.

The statement of the United States Treasury on Thursday, April 16th, shows balances in excess of outstanding certificates as below, comparison being made with the corresponding day of last week:

Table with columns for April 9, April 16, Changes, and rows for Gold, Silver, Legal tenders, Treasury notes, etc., and Totals.

Government deposits with national banks on the same date amounted to \$25,748,388, a decrease of \$141,391 during the week.

Total United States Treasury notes issued under act of July 14th, 1890, in general circulation and in the Treasury, \$134,783,280. Against these are held in the Treasury \$134,783,280.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending April 11th, gives the following totals, comparisons being made with the corresponding weeks in 1895 and 1894:

Table with columns for 1891, 1895, 1896, and rows for Loans and discounts, Deposits, Circulation, Specie, Legal tenders, Total reserve, Legal requirement, and Surplus reserve.

Changes for the week this year were increases of \$387,500 in loans; \$1,355,700 in deposits; \$86,800 in circulation; \$1,680,800 in legal tenders, and \$925,275 in surplus reserve; decreases were \$416,600 in specie.

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 columns for Gold, Silver, Total, and rows for Asso. Banks of New York, Bank of England, Bank of France, Imp. Bank of Germany, Austro-Hungarian Bank, Netherlands Bank, Belgian National Bank, Bank of Spain, Bank of Italy, Imp. Bank of Russia.

The return for the Associated Banks of New York is of date April 11th; all the others are of date April 16th, except the Bank of Italy, which is dated March 10th, and the Bank of Russia, whose return is dated March 1st-13th.

Shipments of silver from London to the East for the year up to April 16th are reported by Messrs. Pixley & Abell's circular as below:

Table with columns for 1895, 1896, Changes, and rows for India, China, The Straits, and Totals.

Arrivals for the week this year were £102,000 in bar silver from New York, and £53,000 from Chile; a total of £155,000. Shipments to the week were £92,500 in bar silver to India £11,000 to China, and £110,000 to Japan; also £63,000 in Mexican dollars to China, a total of £276,500.

The demand for Indian exchange continues large enough to absorb the usual 60 lakhs of Council bills offered in London, but at a slight reduction in

price, the average rate being 14'38d. per rupee. For the Indian fiscal year, which ended March 31st, the total amount of Council bills placed in London was 308,304,373 rupees, realizing £17,523,581, an average of 13'64d. per rupee. For the previous year the total was 311,570,798 rupees, realizing £17,006,993, an average of 13'10d. per rupee. The average increase in values was therefore 0'54d. per rupee.

Domestic and Foreign Coins.

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

	Bid.	Asked
Mexican dollars.....	\$0.54	\$0.55
Peruvian soles and Chilean pesos.....	.48	.49
Victoria sovereigns.....	4.88	4.92
Twenty francs.....	3.88	3.92
Twenty marks.....	4.75	4.80
Spanish 25 pesetas.....	4.78	4.85

Other Metals.

Copper.—The dullness which reigned in the copper market for the past two months appears to have at last come to an end. It has for some days been noticed that manufacturers are becoming somewhat nervous about buying, and if only little business has resulted, it is simply because producers have not changed their attitudes, remaining extremely firm with their prices. There has been quite a good demand for Lake copper during the last few days, and 11c. was bid, but there have been no sellers. Small quantities of ingot copper for summer delivery are hanging about in second hands, and this copper might possibly be secured at 10%, but the quantity is too insignificant to make a market, and the larger producers of Lake copper being practically out of the market, there is quite a scarcity of these brands. Producers of electrolytic copper have been somewhat more willing to meet the market, and while nothing is pressed for sale, we have to lower the quotation for cakes, wirebars or ingots to 10% and cathodes 10%, but very little is obtainable for near delivery, which cannot be delivered as fast as it is wanted. Casting copper remains very dull at 10%. Exports continue at a very satisfactory rate, but it is said that production for the month of March has again been rather heavy.

The London market for g. m. b.'s opened dull and depressed early in the week, but soon recovered strength. The opening price was £44 2s. 6d., which proved to be the lowest of the week, and then from day to day higher prices had to be paid, closing to-day at the best, £45 @ £45 2s. 6d. for spot, and £45 5s. @ £45 7s. 6d. for three months prompt. In spite of the heavy shipments from this side, statistics for the first half of the month show an improvement of 400 tons, quite an unexpected result, which clearly demonstrates how good consumption is. It has of late been repeatedly asserted that the visible supplies as published in Europe do not give the true state of the market, and that consumers hold larger quantities of copper unconsumed, which ought practically to be in public warehouses. That these reports can be circulated only with a certain object is obvious to all producers of copper who can best judge from the nature of the specifications which they have received whether the copper is wanted for speculative or for actual consumptive purposes. The good demand for fine copper continues, and bids for large quantities have recently been submitted to producers here, but were mostly declined, as they have not lowered their prices. For refined and manufactured we quote: English tough, £48 15s. @ £49; best selected, £49 15s. @ £50; strong sheets, £55 10s. @ £55 15s.; India sheets, £52 10s. @ £52 15s.; 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 March and the three months ending March 31st:

	March 1896.	Three mos. 1895.	Three mos. 1896.
Production fine copper, long tons:			
Reporting mines in U. S.....	16,722	23,767	47,910
Pyrites and outside sources U. S. 1,260	4,800	3,600	3,600
Reporting foreign mines.....	6,910	20,900	20,840
Total production, long tons.....	24,832	59,167	72,350
Exports from U. S., fine copper... 10,892	13,786	27,356	

The United States production for the three months shows the large increase of 12,943 tons, or 33.5%. This was more than taken up by the increase in exports, which was 13,570 tons, or 98.4%, over 1894.

Tin.—There has been a better business doing at slightly lower figures, and deliveries have been satisfactory. We have to quote for spot and April 13'35, and May to July 13'40.

In Europe prices have declined slightly, and we have to quote £59 12s. 6d. @ £59 15s. spot and 12s. 6d. higher for three months prompt. The statistical position of the article remains rather unsatisfactory, especially as it is known that large quantities have been retained in the East, said to be about 5,000 to 6,000 tons.

Messrs. De Monchy & Havelaar's circular reports that at the Dutch Trading Company's second sale on March 25th there were disposed of 35,000 slabs Banca at 36 1/2 @ 37 fl., and 4,000 slabs Singkep at 35 @ 36 fl. The next sale will be held toward the end of May. Stocks in Holland (including Banca, Billiton, Straits and Singkep) on April 1st were: Warehouse, 6,586 tons; afloat, 1,431 tons; total, 7,017 tons.

Lead.—There has been very little desire on the

part of consumers to operate in spite of the very low prices now established. It appears that production in the West is rather heavy, and refiners remain free sellers. Consumption is not what it ought to be, and the market is dull at 3 @ 3.05c.

The London market is again slightly easier, and Spanish lead is quoted £10 17s. 6d. @ £10 18s. 9d., and English lead 5s. higher. It is reported that there is continually good buying for consumptive purposes.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is quiet at 2'77 1/2, East St. Louis. Neither buyers nor sellers appear to be making any great efforts to trade, and from present indications we are liable to have a quiet market for some little time to come.

Spanish Lead Market.—Messrs. Barrington & Holt report as follows under date of March 30th: The local quotation for pig lead, on wharf Cartagena, at the opening of the month was 58'50 reales per quintal, but owing to the heavy fall in prices in England on account of large consignments from Australia the quotation fell to 55'25 reales; silver to be paid at 14'50 reales per oz. Late, however, quotations have recovered and are to-day 58'25 reales for pig lead, and 15 reales per oz. for the silver. The average local quotation of pig lead for the month has been 57'43 reales per quintal; silver to be paid at the rate of 14'88 reales per oz. Exchange on London is 30'04 pesetas to £1. Exports of lead from Cartagena have been 1,551,518 kilos. to Marseilles; 1,306,895 kilos. to London; 572,015 kilos. to New Castle; and 206,198 kilos. to Antwerp; making a total of 3,636,626 kilos., of which 921,000 kilos. were desilverized lead. Quotations for lead ore are as follows: f. o. b. shipping port; Potters' ore, 8s. 9d. per cwt.; Linares sulphide, 6s. 9d. per cwt.; Linares carbonate, 4s. 6d. per cwt.

Spelter has been dull and is obtainable somewhat lower. The demand has been rather poor of late, and prices, having advanced rather fast, did not hold at the highest. We have therefore to reduce quotations to 4'05 @ 4'10, with a somewhat more or less nominal market.

Abroad the markets remain firm, and good ordinaries in London are quoted £15 10s., and specials £15 12s. 6d.

Antimony remains dull and lifeless, with only a retail business doing.

Nickel.—Demand continues good and the 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 49 @ 51s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & 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.—Prices are \$37.50 per flask, New York. The London quotations are £6 17s. 6d. per flask; from second hands £6 16s. 3d. @ £6 16s. 6d. is named.

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

	March.	Three mos.
1894, flasks.....	2,853	11,529
1895.....	2,678	8,156
1896.....	2,948	10,637

Exports by sea from San Francisco in March were 2,395 flasks. Exports in the same way for the first three months of the year were 6,899 flasks, against 4,040 in 1895 and 5,766 in 1894. Of the exports this year 3,000 flasks went to Hong Kong, 1,043 to Mexico, 345 to Central America, 10 to New Zealand, 1 to British Columbia and 2,500 flasks to New York. The shipments to China were the first since 1894.

Imports and Exports of Metals.

New York.*	Week, Apr. 9.		Year, 1896.	
	Expts.	Impts.	Expts.	Impts.
Aluminum..... lbs.	1,146	.....	1,569	.....
Antimony ore..... short tons	55	.....	630	.....
regulus..... casks	19	.....	674	.....
Brass, old..... short tons	19	.....	59	.....
Chrome ore..... long tons	1,966	1,289	21,969	1,082
Copper, fine..... long tons	1,178	.....	5,116	11
" matte..... " "	.....	.....	.....	.....
" ore..... " "	.....	.....	1,863	.....
" sulphate..... " "	.....	.....	.....	15
Iron ore..... long tons	.....	.....	.....	.....
" pigs, bars, rods..... " "	.....	50	1,651	.....
Iron pyrites..... " "	.....	.....	2,275	.....
" sulphate..... " "	.....	.....	1,790	.....
Ferro-manganese..... " "	.....	186	742	.....
Ferro-silicon..... " "	.....	.....	75	.....
Manganese ore..... " "	.....	1,077	1,690	11,493
Spiegeleisen..... " "	.....	.....	.....	.....
Lead ore..... long tons	1,300	827	11,194	12,296
" pigs and bars..... " "	.....	5	203	10
Nickel..... long tons	.....	933	9,118	.....
Steel, billets, rods..... " "	.....	110	188	3,823
Tin..... long tons	20,665	30	277,908	.....
Tin and black plates, boxes.....	.....	188	87	.....
Zinc (spelter)..... long tons	.....	.....	.....	.....

* Metal Exchange Reports. † Week ending April 16.

Baltimore.**	Week, Apr. 10.		Year, 1896.	
	Exp.	Imp.	Exp.	Imp.
Bismuth metal, bales, cases.....	16
Chrome ore..... long tons	4,040
Copper, fine..... " "	1,266	.....	7,691	.....
" matte..... " "	500	.....
" sulphate..... " "	138	.....	1,297	.....
Iron, ore..... long tons	5,173	.....	144,802
" pigs, bars, ingots, blooms..... " "	1,247
Iron oxide..... bags	300
" pyrites..... long tons	5,069
Ferro-manganese.....	1,169
" nose..... " "	58
Ferro-silicon..... " "	2,743
Limestone..... short "	56
Manganese ore..... long "	1,673
Spiegeleisen..... " "	333
Steel..... " "	19
Steel wire, bundles.....	2,202
Tin, long tons.....	117	.....	17	97
Tin and black plates, boxes.....	68,040
Zinc (spelter) long tons.....	117

** From our special correspondent.

† Week ending April 16.

Philadelphia.††	Imports.	
	Week, Apr. 10.	Year, 1896.
Antimony, casks.....	67
Copper ore, long tons.....	4,300
Iron..... " "	9,650	62,780
" pig..... " "	320
" and steel scrap, long tons.....	618
Manganese ore, long tons.....	2,224
Spiegeleisen..... " "	59
Tin..... " "	185
Tin and black plates, boxes.....	14,375

†† From our special correspondent.

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

Aluminum:	
No. 1, 98% pure rolling ingots, per lb.....	50 @ 55c.
No. 1, 98% " ingots for re-melting, per lb.....	45 @ 53c.
No. 2, 94% pure.....	38 @ 42c.
Ingots from scrap, per lb.....	35 @ 40c.
Aluminum-nickel casting metal, per lb.....	40 @ 45c.
Bismuth, per lb.....	\$1.30 @ \$1.75
Phosphorus, per lb.....	50 @ 55c.
Platinum, per oz.....	\$13 @ \$14.50
Tungsten, pure, powder per lb.....	70c.
Tungstic acid, per lb.....	45c.
Ferro-tungsten, 60% in ton lots, per lb.....	60c.

The variations in price are chiefly on size of order.

Cartagena, Spain. March 30.

(Special Report of Barrington & Holt.)

There still continues a big demand for all kinds of ores, and some fancy prices have been paid for prompt cargoes of high-grade manganiferous ores. Some mines are working night and day, and there is considerable difficulty in obtaining carts and donkeys for hauling the ore. During the month of March there were 13 cargoes of manganiferous and seven cargoes of iron ores shipped; three of the former going to the United States.

We quote for forward delivery, 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.; specular iron ore, 60% iron and guaranteed under 0'63% phosphorus, 8s. 9d. per ton. For manganiferous ores 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. per ton.

We quote for iron pyrites, 40% iron and 45 sulphur, 10s. 6d. per ton; for best yellow ochre, 40s. per ton.

Exports of other metals (outside of iron and lead) have been 400 tons of copper ore to France, 100 tons zinc ore to Antwerp; 20 tons galena ore to Marseilles; 29 tons ochre to London, 2,644 kilos. quicksilver to London; 1,985 kilos silver bars to Marseilles; and 64,837 kilos old bronze cannon to Copenhagen.

CHEMICALS AND MINERALS.

New York, Friday Evening, April 17.

Heavy Chemicals.—We must continue to report a very quiet market. Caustic soda remains featureless about the only business that is doing in it consisting of deliveries on existing contracts. Prices, however, remain steady. Alkali is in a somewhat better position owing to the freer inquiry for future delivery which we noted in our last issue. Bleaching powder is quiet at unchanged prices. Sal soda is in better demand and prices are steady. We quote: Caustic soda, 2'12 1/2 @ 2'25c. for spot, according to test; carbonated soda ash, 48% is '85 @ 1c., according to quantities and deliveries. Alkali is 80 @ 95c., according to test and package. Bleaching powder, prime brands, \$1.02 1/2 @ \$1.75. Sal soda, 60 @ 65c.

Acids.—There is nothing new to report in the acid market. Deliveries on regular contracts are made freely and the inquiries for spot have been somewhat more numerous during the past week. Prices are as last reported per 100 lbs. in New York and vicinity, in lots of 50 carboys or over, as follows: Acetic acids (in barrels), \$1.40 @ \$1.70. Muriatic acid, 18", 75 @ 80c.; 20", 80 @ 90c. Nitric acid, 36", \$3.00 @ \$4

40°, \$4@4.50; 42°, \$4.25@4.75. Oxalic acid, \$7.10@ \$7.60. Mixed acids, according to mixture. Sulphuric acid, 66°, 75@85c.; chamber acid, \$6.50@7.25 per ton at factory. Blue vitriol, \$3.75@4, according to size of order.

Brimstone.—We quote for shipments, best un-mixed seconds, \$15.50@15.75. Thirds are 25c. less. Spot or nearby is \$16 for seconds.

Fertilizing Chemicals.—We must continue to report a dull fertilizer market. The demand has been slow, but it is expected that it will show some improvement soon. Prices, although without any change of importance, are somewhat weaker. Our quotations this week are as follows: Sulphate of ammonia, gas liquor, \$2.30@ \$2.40; bone, \$2.25@2.30. Dried blood, high grade, \$1.2@1.75; low grade, \$1.00 per unit. Azotone, \$1.80. Concentrated phosphate, (30% available phosphoric acid), 70@71½c. per unit. Acid phosphate, 13% to 15% av. P₂O₅, 57c. per unit at seller's works in bulk. Dissolved bone black, 17% to 18%, P₂O₅, 90@92c. per unit. Acidulated fish scrap, \$12, and dried scrap with few or no sales, nominally \$21 f. o. b. fish factory. Tankage, high grade, \$19@20; low grade, \$18@19. Bone tankage, \$21; ground bone, \$18@20. Bone meal, \$21@22.50.

Sulphate of Potash: 90-95%. New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$2.

Double Manure Salts: 48-53%. New York and Boston, \$1.01; Philadelphia, Baltimore and Norfolk, \$1.02; Southern ports, \$1.03½.

Muriate of Potash.—New prices for muriate are New York and Boston, 1.75c.; Philadelphia, Baltimore and Norfolk, 1.76½c.; New Orleans, 1.78½c., for 80@85% (basis of 80%), in lots 25 tons and upward.

Kaimit.—Quotations for 1896 are as follows: New York, Boston, Philadelphia and Baltimore, \$8.55 per ton; Norfolk, \$8.90, and New Orleans, \$9.15 per ton, for 25 tons and upward. Sylvinit at the same ports is quoted at 36½c., 37½c. and 38c., respectively.

Nitrate of Soda.—Spot, \$1.70; to arrive, \$1.75@ \$1.85.

NOTES OF THE WEEK.

Shipments of Florida phosphates for March are reported as follows: Punta Gorda, 8,001 tons; Port Tampa, 12,522 tons; Fernandina, 24,182 tons; Brunswick, Ga., 3,638 tons; total, 47,746 tons.

Shipments of phosphates from Charleston, S. C., to domestic ports for the seven months from September 1st to March 31st, were, in tons:

	1894-95.	1895-96.
Crude rock.....	53,851	70,612
Ground rock.....	1,355	7,927
Total.....	55,219	78,539

The increase this year was 23,320 tons, or 42% in all.

The details of the lately reported Nitrate of Soda Convention are now published in the *Phosphate Industrie*. The duration of this combine will be three years from April 1st, 1896, and the total maximum of nitrate of soda to be shipped will not exceed 1,080,000 tons from March 1st, 1896, to March 31st, 1897. If, however, the price of ordinary nitrate of soda in Chile exceeds 6s. per quintal on September 1st, 1896, the directors of the convention are at liberty to increase this quantity. In a circular recently published it is calculated that the stock in Europe from July 1st, 1896, to June 30th, 1897, will probably be about 1,630,000 tons, against a consumption of about 1,000,000 tons in the preceding year. In this circular it is estimated that the consumption from March 1st to the end of June, 1896, will be 450,000 tons, and the shipments to Europe 950,000 tons. The quantity of nitrate of soda shipped from all ports during 1895 amounted to 1,210,000 tons, against 1,075,000 tons in 1894, 925,000 tons in 1893, and 795,000 tons in 1892 and 1891. In accordance with the above the proposed decrease in shipments seems very moderate.

MINING STOCKS.

Complete quotations will be found on pages 390 and 391 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.

New York, Friday Evening, April 17.

The mining stock market during the past week has been uneventful. In other words, it was as dull as usual, which means that it was very dull indeed. Possibly the exceedingly warm weather this week has added to the customary depression of the market.

Business on the Consolidated Stock and Petroleum Exchange has been of a desultory nature. The Comstock ruled quiet. Comstock Tunnel shows sales of 3,100 shares at 6c. Consolidated California & Virginia was traded in to the amount of 400 shares at \$1.60 to \$1.70. There were sales of 1,400 shares of Mexican at prices varying from 35@40c. Other sales were as follows: Best & Belcher, 200 shares at 48@55c.; 100 shares of Hale & Norcross, at \$1.30; 300

shares of Ophir, at \$1.05@1.20; 200 shares of Potosi at 30c.; 300 shares of Savage at 27c.; 100 shares of Sierra Nevada, at 60c., and 300 shares of Yellow Jacket, at 32@33c.

Brunswick Consolidated at 13c.@14c. shows sales of 300 shares. An official report from the Brunswick Consolidated mine says: "We have on the 800-ft. level of the Brunswick mine a 3-ft. vein. We have just had a run of 10 tons of that ore which netted \$100 a ton."

The Colorado stocks were in a little better demand this week. Mt. Rosa shows sales of 2,200 shares at 8c.@11c. Creede & Cripple Creek was traded in as usual this week to the extent of 1,200 shares at 5c.

There were also sales of 500 shares of Golden Fleece at \$1.75; 700 shares of Iron Silver, which opened at 23c. and closed at 20c. Other sales were 500 shares of Lacrosse at 11c.; 800 shares of Little Chief at 18@19c.; 500 shares of Leadville Consolidated at 13c.; 200 shares of Mollie Gibson at 75c. According to the official figures Victor continued to advance; it opened at \$7.38 and closed at \$7.50 with total sales of 600 shares.

We have been requested to publish the following in reference to the item published in our last issue (page 359) referring to the fact that the California Mining Company in Gilpin County, Colo., was no longer draining the Gold Coin mine. The Gold Coin Mines Company, through its consulting engineer, writes us as follows in reference to the matter:

"The California Company has been hoisting water under a contract with the Gold Coin Mines Company, purely as a matter of convenience to us, but not necessary for our continued operations. As we find ourselves in a position to do this work cheaper than the terms which the California Company is disposed to demand we have decided it is to our advantage to care for our own water by the operation of our own pumps. We have a set of steam pumps in the Hidden Treasure shaft and a fine Cornish pump in the Kansas shaft. The workings of these two mines are within a few feet of being connected on the 1,000 ft. level, so that between our two pumping plants above referred to we do not anticipate any trouble in handling the water at all times. There is nothing serious about the water question on Quartz Hill, where we are mining, and we expect, as in the past, to be always able to handle the water ourselves. This change is simply business economy."

Boston. April 16.

(From Our Special Correspondent.)

The market for copper stocks the past week has been rather tame and transactions light, while prices have generally been well sustained. Boston & Montana sold, ex-dividend, at \$7½, declined to \$7¼, and rallied to \$7, losing in later dealings a portion of the advance, closing to-day at \$7¼. Butte & Boston has been neglected; a few sales reported at \$2½ to \$2.

Calumet & Hecla sold at \$308, dropped to \$306, with one share selling to-day at \$309.

Quincy was strong early in the week at \$125. Rumors of an injunction to restrain the payment of dividends from the surplus caused free offerings of the stock, resulting in a decline to \$119, from which it rallied to-day to \$120½.

Tamarack advanced from \$97 to \$100, but later sales were at \$98, closing at \$98½.

Oscuela was a little firmer, with small sales at \$26, an advance of ½.

Kearsarge declined to \$10½, with a later rally to \$11.

A small lot of Franklin sold at \$11. At the meeting yesterday the directors were re-elected, and reports of the work of development in the Franklin, Jr., were of a very satisfactory character.

Wolverine sold at \$7@7¼ in a small way.

Old Dominion sold at \$15, advanced to \$17, and closed at \$16.

In the gold stocks Pioneer and Merced have been the active stocks. The former was very steady at about \$9 during the early part of the week. Yesterday it took a start and sold up to \$10 on the expectation that the report for March would show an increase in net earnings over February. The report showed the earnings for six months to March 31st to be about \$37,000 net, an average of \$6,300 per month, but did not give the net for March, and traders at once concluded that there was something kept back and this morning jumped on the stock and succeeded in depressing the price to \$8½. Later the officials of the company state that the net for the month of March was \$7,800.

Merced rallied from the depression of last week and sold up to \$19½, with a subsequent decline to \$17½.

Gold Coin advanced from 65 to 72½c. with considerable activity.

Santa Ysabel was up ½ to \$14½ on small transactions.

Napa Quicksilver sold at \$7 for 100 shares only.

Colorado Springs, Colo. April 11.

(From Our Special Correspondent.)

The mining stock market this week has been unsatisfactory in that prices have continued to show a declining tendency. In the case of certain stocks it looks as if the drop had been checked, as enough buying orders at certain figures are in the hands of brokers to stiffen prices. Other shares will probably go a little lower before a similar reaction takes place in their case.

The absence of buying orders has encouraged the bears and the number of people who have been selling short lately is probably greater than ever before in the history of our exchanges. There is a limit to all declines, however, and possibly if some of the bears find themselves unable to cover their sales an upward movement may occur which will offset the dullness of the past month or two.

Messrs. Gardner & Co. furnish the closing quotations of the Colorado Springs Mining Stock Exchange for the week ending April 16th, as follows:

Name of Company.	Apr. 10	Apr. 11	Apr. 13	Apr. 14	Apr. 15	Apr. 16
Alamo.....	.04	.05	.08	.07	.06½	.06½
Anaconda.....	.55	.58	.62	.67	.67	.64
Arcatum-Juniata.....	.55	.56	.58	.58	.57	.55
Blue Bell.....	.06	.06	.06	.07	.07	.07
Cripple Creek Con.....	.13½	.14½	.15½	.15	.14½	.14½
Golden Fleece.....	1.60	1.65	1.65	1.65	1.67	1.65
Isabella.....	.54	.54½	.54½	.55	.55½	.55½
Mollie Gibson.....	.62	.65	.72	.72	.68	.68
Mount Rosa.....	.88½	.08½	.09½	.10½	.10½	.10½
Pharmacist.....	.08	.08½	.10	.11½	.0	.09½
Portland.....	.55	.56	1.46	1.48	1.48	1.48
Silver State.....	.01	.01	.01½	.01½	.01½	.01½
Union.....	.58	.59	.41	.41½	.40	.39½
Work.....	.10	.11½	.13	.13	.13½	.12½

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

Name.	Apr. 10	Apr. 11	Apr. 13	Apr. 14	Apr. 15	Apr. 16
Bankers.....	.11	.12½	.15½	.14½	.14	.13½
Des Moines.....	.05	.07	.08	.08	.06	.07½
Gold & Globe.....	.23	.22	.23	.22	.24	.21½
Gold Standard.....	.07	.08	.09	.08½	.10	.08
Isabella.....	.54	.55	.55	.55	.56	.55½
Jefferson.....	.19	.19	.18½	.22	.14	.21½
Keystone.....	.05	.07	.06	.05½	.05	.04½

Cleveland, O. April 16.

(From Our Special Correspondent.)

Scarcely a sale has been reported this week in the iron ore stock market, which is almost featureless. To the closeness of the local money market and the absence of a general buying movement in securities are attributed the causes. But its stocks are not weak. They are in strong hands and there is no disposition to dump any of them on the market. Current quotations follow:

Name of Company.	Par val.	April 16.	
		Bid.	Ask.
Aurora.....	\$25	.....	\$8
Candler.....	25	\$12	45
Cleveland-Cliffs Iron Co.....	100	43	44
Jackson Iron Co.....	25	70	75
Lake Superior Iron Co.....	25	30	32
Lake Superior Consolidated.....	100	21	22
Minnesota Iron Co.....	100	69	71
Pittsburg & Lake Angeline.....	25	80	90
Republic Iron Co.....	25	19	20

Salt Lake City, Utah. April 11.

(Special report of James A. Pollock.)

The stock market was exceedingly active during the greater part of the week, and indulged in some wild fluctuations, nearly all curious to well posted people.

Ajax remained about stationary, with inquiry for the stock showing an increase. Anchor evidenced more strength in both the bidding and offering. Alliance made no show of strength. Gas made a slight improvement, but there is little demand for the stock. Bullion-Beck continued strong and active, selling higher than for some time past. Bogam contributed nothing new during the week. Dalton & Lark will pay its second dividend of ½c. per share April 15th. Dalton recovered some of its lost strength. Daly did considerable business at good figures. Daly-West was held very firmly, the demand being greater and the selling price materially higher. Eagle was somewhat stronger, buyers coming out in increased numbers. Galena has just paid a dividend of \$5,000 or 5c. per share, the heaviest yet paid for any one month. The stock was in good demand at advanced prices. Geyser made no material change. Little Pittsburg was, as usual, very active and closed at better figures than for several weeks past. There will be no delinquent sale of stock, the assessment being entirely paid.

As stated in last week's letter, the Mercur Company will pass its April dividend on account of maturing payments and the closing down of operations at the mill for one week last month. The stock sold down as low as \$6.25, but the reaction came with a rush toward the end of the week, the quotation lingering around \$7. Notwithstanding the passing of the dividend there were many buyers in the field. Ontario was very strong above \$13.30. Silver King paid \$37,500 on the seventh making a total of \$600,000. The stock was in great demand at \$15.50. Utah paid a double dividend of \$2,000 or 2c. per share, April 10th.

San Francisco. April 13.

(From Our Special Correspondent.)

The market opened on Monday with a show of activity in the old board, and prices were higher than for some time past. Late in the day, however, there was a break in prices and the decline continued on Tuesday. By Wednesday the market settled down to low prices and light business again, and the week closed very quietly.

Some quotations are as follows: Consolidated California & Virginia, \$1.65@1.70; Hale & Norcross, \$1.30; Ophir, 99c.@1; Occidental, 88@92c.; Confidence, 73c.; Sierra Nevada, 57@58c.

The Hale & Norcross Company having refused to further contribute to the expense of developing the Brunswick lode, Superintendent Kervin has stopped all work in the Norcross portion of the ground where the combination of Comstock com-

panies is operating. Work at all other points on the Brunswick lode will continue as before.

Work was resumed in the Hale & Norcross mine on April 8th with a force of 20 men. It is at present under charge of President Lynch and Jonas Cronan, who is acting superintendent. Nothing is said as to the action of the company in relation to Superintendent Tangerman. The ore from the mine will hereafter be worked in the Dazet mill, which is not under ring control.

The delinquent list from the last Consolidated California & Virginia assessment shows about 15,000 shares, all in small lots. This is considered a fair showing, in view of the condition of business.

The Alaska Willoughby Gold Mining Company of Alaska has levied an assessment of 20c. per share, delinquent May 25th.

The Kate Hayes Mining Company, of Nevada County, has levied an assessment of \$1.25 per share, delinquent April 24th.

The following companies had cash on hand on April 1st, according to the statements placed on file: Alpha, \$2,397; Alta, \$4,902; Andes, \$12,706; Belcher, \$3,128, with an overdraft at the bank of \$10,500; Best & Belcher, \$4,870; Bodie, \$4,212; Bulwer, \$3,152; Bullion, \$1,535; Caledonia, \$3,556; Challenge, \$562; Confidence, \$3,573; Crown Point, \$4,342; Consolidated New York, \$1,157; Consolidated Imperial, \$2,132; Church, \$16,559; Consolidated California & Virginia, \$3,073, with a note due the bank amounting to \$15,000 and an assessment in the process of collection; Exchequer, \$3,399; Chollar, \$13,571; Gould & Curry, \$265; Hale & Norcross, \$3,425; Julia, \$1,040; Justice, \$2,149; Kentuck, \$1,653; Lady Washington, \$728; Mexican, \$7,404; Mono, \$2,131; Overman, \$3,770; Potosi, \$7,903; Savage, \$7,118; Segregated Belcher, \$83; Silver Hill, \$295; Sierra Nevada, \$18,658; Standard, \$23,178; Syndicate, \$731; Union, \$16,089; Utah, \$175.

The Ophir reports an indebtedness of \$99, Occidental \$204 and Summit \$1,816.

The contest over the control of the Bulwer Consolidated Company culminated in a sensational adjournment of the annual meeting by the old board after the New Yorkers had established the fact that with some 16,000 disputed shares they held the majority of the stock represented. An injunction from the courts was obtained in time to bar the use of the stock, but the legal proposition will have to be argued out in court, unless a compromise is made.

THE NEW EXCHANGE.

The membership of the Gold Mining Exchange has been increased to 60 persons. The stock of the Lockwood Consolidated Gold Mining Company, of Grass Valley in Nevada County, was listed this week. Several other Grass Valley properties are being examined for the Exchange.

Some of this week's quotations on the board were as follows: Providence, \$85; Keystone Consolidated, \$65; Amalie, \$1.85@\$1.90; Thorpe, 88@89c.; Savannah, 32c.; Grant, 27@29c.

At the formal opening of the San Francisco Gold Mining Exchange, on Monday, April 6th, a large audience assembled so that there was difficulty in accommodating them in the board room. President Walter Turnbull occupied the chair and made a short introductory address, in which he outlined the history of the Exchange. The eyes of the world would again be turned upon the gold-fields of California, he said, and it was the object of the Exchange to bring together the honest miner and the man of capital, that the one might receive encouragement and compensation for his labor and property and the other a productive mine for his money.

Concluding, he introduced Irving M. Scott, who referred to the importance of the gold production in business. Thus far gold has been dug in California only in a superficial way. There is plenty more gold at deeper levels in mines that have been worked and an inestimable amount that has not yet been discovered. Let us develop our gold mines, which are the foundation of the prosperity of this State.

The next speaker was President Hugh Craig, of the Chamber of Commerce. The general opinion seemed to be, he said, that the mining days of California had passed. But the mines were still the glory of California, and they should be worked. The new exchange was starting out on the right principle, and its success was assured.

John Daggett addressed the audience from the standpoint of a miner of long practical experience. The new exchange had, he said, been organized for a purpose of great importance to San Francisco. The production of gold was the State's most important industry. The new institution would be of wonderful service to persons who wished to invest in mines.

President Turnbull was about to declare an adjournment when Col. P. T. Dickinson, in remarks highly complimentary of President Turnbull's work in the organization of the Exchange, presented that gentleman with a handsome gold watch on behalf of the members. President Turnbull, in a fitting speech, returned his thanks. The proceedings were closed by a lunch. Quite a number of ladies were in attendance.

London. Apr. 4.

(From Our Special Correspondent.)

The past week has been a very dull one and hardly any business has been done. The fact that the present is a three-week account and that the Easter holidays come in the middle of it, has kept specu-

lators aloof. This year things are so dull in the city that most people went away on the Wednesday or Thursday before Easter, and will stay away until the end of Easter week. The troubles in South Africa are also exercising an adverse effect on the market. The Transvaal political difficulty is still threatening, and the Matabele outbreak is causing great anxiety. Last week I mentioned the proposal that Messrs. Rhodes and Rudd's interest as managing directors of the Consolidated Gold Fields of South Africa in the profits of the company should be purchased by the company for 100,000 new ordinary shares. This proposal has been adopted at a large meeting of the shareholders without a dissentient voice. The solicitors and auditors of the company explained how the details of the scheme had been arrived at, and as they showed the question in its correct light, adverse criticism was disarmed. It is just as well that this uncertain speculative factor in the company should be got rid of, though the price paid seems a high one.

In West Australians there has been some little business doing, but nothing of interest has transpired. Indians and New Zealanders have been active. Americans have received no attention. American vendors and promoters are active, as will be seen from the following list of companies formed in London during February and March to deal with North American properties: Choctaw Exploration Company, Limited, capital £2,000, to acquire mineral oil properties in Indian Territory; Regina (Canada) Gold Mine, Limited, capital £150,000, object not further specified; Alma Colony Corporation, Limited, capital £400,000, to lay out a town in California; Lynx Creek Gold Mining Company, Limited, capital £50,000, to carry on mining work in the United States; Lone Ridge Gold Mine Company, Limited, capital £80,000, to acquire a mine in California; Morris Ravine Gold Mines, Limited, capital £150,000, to acquire a mine in California; Howie Gold Mine, Limited, capital £400,000, to acquire the Howie & Lawson gold mines, Union County, N. C.; Anglo-Colorado Exploration Syndicate, Limited, capital £100,000, to acquire land in Colorado from Baron von Richthofen; British Columbia Mining Company, Limited, capital £20,000, to explore in British Columbia; Cripple Creek Pioneers, Limited, capital £50,000, object not specified; Kootenay Gold-fields Syndicate, Limited, capital £20,000, to explore in British Columbia; Seine River (Ontario) Gold Mines, Limited, capital £100,000, to acquire mines in Seine River district; Bear Creek Alluvial Gold Company, Limited, capital £80,000, to acquire mines in Elmore County, Idaho; Cripple Creek Proprietary Company, Limited, capital £150,000, to acquire mines at Cripple Creek.

Paris. April 5.

(From Our Special Correspondent.)

Our markets generally are very uncertain, and rumors of war still exercise much influence. There are too many opportunities for trouble to permit financiers to feel easy about the future, and as a rule no one is entering into long engagements if they can possibly be avoided.

The metallurgical shares are still in demand and present the most active section of the market, though there has been a slight reaction this week in the prices of some of them. Such changes are to be expected, especially as values have risen to a high point.

The copper stocks are still strong. Rio Tintos showed a gain this week, while Tharsis and Cape Copper hold all of their late advances. Boleo shares still continue to go up, as the accounts from the mine are excellent. The demand for copper seems to increase in full accordance with the supplies.

The shares of the zinc companies are in considerable request just now. Prices are fluctuating and uncertain, but upon the whole are well maintained. The Spanish lead companies' stocks are generally strong, notwithstanding the bad condition of business in that country. Nickel experienced a fall of some importance this week, though no reason for it is apparent.

Huanchaca (silver) shares continue low, because silver is lower, and because reports from the mine are not good. It seems a pity that better management cannot be had for this great property, which has many of the elements of success.

The Nitrate shares are dull and generally lower. It was supposed that the convention among the companies had been settled, but it seems there are still some difficulties in the way. The prices of the product, moreover, are still low.

The South African market continues heavy, and all prices are lower, though sales have not been very large. The general tone of feeling in London, as shown by various public manifestations, and the venom of the recent articles in the London Times, have had a bad effect here. The chances of a settlement of the Transvaal troubles are apparently growing less, and it looks very much as if the production of the mines must be on a diminished scale for several months yet before matters are settled. There is still a great deal of indignation against the politician mine managers who have used their stockholders' money in a way wholly inexcusable, and various ways of calling them to account are suggested. It looks very much as though English opinion was in favor of a conquest of the Transvaal, even though such a policy would involve a complete disregard of right and justice. This would, indeed, be nothing new far our greedy and conscienceless neighbor; but is it practicable? A Boer war, backed as it might be by an insurrection in the Cape Colony and

with fresh Zulu and Matabele outbreaks, could hardly be brought to a conclusion satisfactory to England unless from 60,000 to 100,000 troops were put into South Africa, and one cannot see where England can spare such a force, while a smaller one would mean defeat.

The reports which reach us this week of an alliance between your high protectionists and the free silver men are disquieting, and have a very unfavorable influence on American securities. At this distance, of course, one cannot tell just how much force there is in these rumors, but such an understanding seems quite natural. One can only hope that your business men will see how fatal the policy outlined by a union of this kind would be to them, and that they will use their influence to defeat its objects. AZOTE.

MEETINGS.

Name of Co.	Location of office.	Date.	Time.
Constellation	Park City, Utah	May 4	2 p. m.
Peruvian Con...	34 Commercial Block, Salt Lake City, Utah	" 11	7.30 p. m.
Placer	510 Cooper Building, Denver, Colo.	" 12	10 a. m.
Rodondo	5 Jacobson Building, Denver, Colo.	" 2	4 " "
Ybarra (Gold)	132 Market St., San Francisco, Cal.	April 21	8 " "

ASSESSMENTS.

Name of Co.	Loc'n.	No.	Ding.	Sale.	Amt.
*Alpha Con	Nev	16	May 12	June 2	.05
Belcher	"	32	Apr. 7	Apr. 28	.25
Brunswick Con	Cal	10	Mar. 23	" 22	.03
Bullion	Nev	47	Apr. 22	May 14	.10
*Caledonia	"	46	May 6	" 27	.05
Challenge Con	"	21	Apr. 29	" 20	.05
Con. Cal. & Va.	"	6	" 8	Apr. 28	.30
Crown Point	"	67	May 6	May 26	.20
Gould & Curry	"	78	Apr. 28	" 20	.15
Lady Emma	Cal	"	" 6	" 27	.15
Lucky Hill	Utah	18	" 18	May 9	.02
Marguerite	Cal	2	" 1	Apr. 30	.10
No. Banner Con	"	38	Mar. 31	" 28	.03
Occidental Con	Nev	22	May 10	May 28	.10
Old Flag	Cal	2	" 10	" 26	.03
Paxman	Utah	"	Apr. 18	" 2	.02
*Potosi	Nev	45	May 14	June 4	.20
Rainbow	S. D.	10	Apr. 7	Apr. 25	.008
Tetro	Utah	3	May 2	May 25	.01
Thorpe	Cal	1	Apr. 20	" 15	.05
*Utah Con	Nev	22	May 6	" 27	.05

*New assessment.

DIVIDENDS.

NAME OF COMPANY	Current Dividends.		Paid since Jan. 1, 1896.	Total to date.
	Date.	Amount.		
*Aetna Con			\$10,000	\$50,000
Alaska-Mexican			15,200	119,031
Alaska-Treadwell			75,000	2,750,000
Boston & Mont.	May 20	\$500,000	600,000	4,025,000
*Bullion Beek & Ch			65,500	2,015,000
*Calumet & Hecla			500,000	43,850,000
*Centennial-Eureka			150,000	1,650,000
*C. O. D.			5,000	25,000
*Dalton & Lark	April	12,500	25,000	25,000
Dominion Coal			600,000	
*Florence			10,818	45,976
*Galena	April	3,000	6,000	25,000
*Gold Coin			30,000	45,000
*Golden Fleece			54,000	455,179
Gold & Globe Hill			15,000	24,375
Hecla Con			30,000	2,130,000
Highland			25,000	3,109,918
*Homestake	Apr. 25	31,500	125,000	5,537,500
Horn Silver			50,000	5,130,000
*Iron Mountain	Apr. 13	5,000	25,000	135,000
*Isabella	" 25	22,500	67,500	90,000
*Le Roi			25,000	10,000
*Mercur			75,000	425,000
Minnesota Iron	Apr. 15	247,500	247,500	2,992,500
*Mont. Ore Pur. Co.	" "	40,000	160,000	320,000
Moose			6,000	186,000
Napa Con	Apr. 1	10,000	30,000	770,000
*Ontario			45,000	13,220,000
Osceola Con			75,000	2,022,500
*Ottawa			1,000	1,000
Portland			60,000	683,000
Quincy	Apr. 17	200,000	40,000	3,070,000
*Small Hopes			25,000	
*Silver King	Apr. 2	37,500	150,000	600,000
Smuggler-Union			500,000	1,840,000
*Utah	April	3,000	8,000	140,100
*Victor	" 15	20,000	80,000	545,000
*Victor M. & L.			9,000	33,000
Totals			\$932,500	\$4,381,018
				\$103,585,079

* March dividend paid.

This table doesnot 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 Name of Company, Location, Par value, and dates from April 10 to April 16. Includes companies like Allouez, Arnold, Atlantic, etc.

NEW YORK. Table with columns for Name of Company, Location, Par value, and dates from April 11 to April 17. Includes companies like Adams, Ajax, Alamo, etc.

INDUSTRIAL COAL AND COAL RAILROAD. Table with columns for Name of Company, Par value, and dates from April 11 to April 17. Includes companies like Balt. & Ohio, Ches. & Ohio, etc.

Table with columns for Name of Company, Location, Par value, and dates from April 11 to April 17. Includes companies like Adams, Ajax, Alamo, etc.

COLORADO SPRINGS, COLO. Table with columns for Name of Company, Par value, and dates from April 6 to April 11. Includes companies like Ajax, Alamo, Antrim, etc.

ST. LOUIS, MO., STOCKS. Table with columns for Name of Company, Company's Office, Par value, Bid, Asked, and Last Dividend. Includes Central Lead, Doe Run Lead, etc.

SAN FRANCISCO, CAL. Table with columns for Name of Company, Location, Par value, and dates from April 11 to April 17. Includes companies like Alta, Belcher, Best & Belcher, etc.

BALTIMORE, MD. Table with columns for Name of Company, Location, Par value, Bid, Asked, and Last Dividend. Includes Balt. M. & S. N. C., Conrad Hill, etc.

MISCELLANEOUS SECURITIES. Table with columns for Name of Company, Location, Par value, Bid, and Asked. Includes American Coal, Chattanooga Ore & Iron R. R., etc.

LONDON.

April 4.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Last dividend, Quotations. Lists various mining companies like Americans, Alaska-Treadwell, etc.

DENVER, COLO.

Table with columns: NAME OF COMPANY, Par val., Apr. 6, Apr. 7, Apr. 8, Apr. 9, Apr. 10, Apr. 11, Sales. Lists companies like Addie C., Alamo, Amity, etc.

PARIS. Week ending April 3.

Table with columns: NAME OF COMPANY, Country, Product, Capital stock, Par value, Div. last year, Prices. Lists companies like Acieries de Creusot, Firminy, etc.

MEXICO. Week ending April 9.

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

VALPARAISO, CHILE.* Fortnight, Feb. 29.

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

SHANGHAI, CHINA. March 20.

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

PHILADELPHIA, PA.*

Table with columns: NAME OF COMPANY, Loca. tion, Par Val., April 9, April 10, April 11, April 12, April 13, April 14, April 15, Sales. Lists companies like Acety. L.H. & P., Bethlehem Ir., etc.

SALT LAKE CITY, UTAH.* Week ending April 11.

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

PITTSBURG, PA.* Week ending April 14.

Table with columns: NAME OF COMPANY, Loca. tion, Par val., Bld., Ask., Selling price, NAME OF COMPANY, Loca. tion, Par val., Bld., Ask., Selling price. Lists companies like Mansfield, Allegheny, etc.

HELENA, MONT.* Week ending Mar. 31.

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

DULUTH, MINN.* Week ending April 11.

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

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns for Name and Location of Company, Capital Stock, Shares, Assessments, Dividends, and Date and Amount of Last. It lists 130 dividend-paying mines and 125 non-dividend-paying mines.

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 \$31,330,000 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
 Bostelmann, Louis F.
 Bullock, M. C., Mfg. Co.
 Burleigh & Co. Drill Co.
 Clayton Air Compressor Works.
 Fraser & Chalmers.
 Ingersoll-Sergeant Drill Co.
 (See Diamond Drills)

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.
 Pittsburg Bridge Co.
 Pollock, Wm. B. & Sons.
 Waker Mfg. Co.

Assayers' and Chemists' Supplies
 Anaworth, Wm.
 Baker & Adamson.
 Baker & Co.
 Becker, Christian.
 Bullock & Crenshaw.
 Denver Fire Clay Co.
 Elmer & Amend.
 Henry Hill Chem. Co.

Attorneys, Corporation
 Emig, C. E.
 McIndoe, H.

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

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

Banks and Brokers
 Arkel, E., & Co.
 Bartle & Co.
 Boy, R. G., & Co.
 Bonbright, W. P., & Co.
 Carnouff, A. A.
 Crandell & Huff.
 Crip, C. R. Syn. Inv. Co.
 Decker, L. R.
 Duer, G. C.
 Dorsey, H. H.
 Doubleday Rope & Co.
 Edsall, Clarence & Co.
 Fall, Brooks & Cramer.
 Faranworth, C., & Co.
 Fitts, G. W., & Sons.
 Fletcher, C. S., & Co.
 Freyschlag, Kirby & Gardner & Co.
 Grant, E. R.
 Handy & Harman.
 Harriott, W. M.
 Hendrickson, W. J.
 Heron Bros.
 Hodgins, L. W.
 Hicks & Benzle.
 Johnson, L. L.
 Keith, F. M.
 Kenrick, W. F.
 Key, J. J.
 Kinney, M.
 Kiehlender, C. F. & Co.
 Leitch, Geo. B., & Co.
 Hendrie & Bolthoff Mfg. Co.
 Lehnmeier, N.
 Miller, Chas. N., & Co.

Belt Lacing
 Bristol Co.

Blasting Caps
 Metallic Cap Mfg. Co.
 Caps and Fuse
 Macbeth, James & Co.
 Metallic Cap Mfg. Co.

Pressure Blowers
 Connorsville Blower Co.

Belting
 Denver Eng. Wks. Co.
 Enterprise Boiler Co.
 Fraser & Chalmers.
 Philadelphia Eng. Wks., Ltd.
 Pollock Wm. B. & Co.
 Risdon Iron Works.
 Scaife, Wm. B. & Sons.
 Stilwell, Pierce & Smith-Valle Co.
 (See Machinery.)

Belting Cloth
 Besley, Chas. H. & Co.

Brewers
 Pabst Brewing Co.

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

Bridges
 Berlin Bridge Co.
 Pittsburg Bridge Co.

Buckets
 Scaife, Wm. B. & Sons. (See Machinery.)

Carbons
 Bishop, Victor, & Co.
 Bostelmann, Louis F.
 Lexow, Theodore.

Chain and Link Belting
 (See Belting.)

Chemicals
 Baker & Adamson.
 Bullock & Crenshaw.
 Elmer & Amend.
 Henry Hill Chem. Co.
 Herwin-White Coal Mfg. Co.
 Casner & Curran
 Consolidation Coal Co.
 Coal Crushers
 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.
 Alle, Ed. P. & Co.
 Becker Foundry & Machine Co.
 Blake, Theo. A.
 Boston Ore Machinery Co.
 Bradley Pulverizer Co.
 Colorado Iron Works.
 Denver Eng. Works Co.
 Engsbach Mach. Mfg. Co.
 Fraser & Chalmers.
 Free Vanner Concentrator.
 Hendrie & Bolthoff Mfg. Co.
 Joplin Mach. Co.
 Krom, S. R.
 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 & Mont M Co.
 Bridgeport Copper Co.
 Butte & Boston M. Co.
 Canadian Copper Co.
 Copper Queen Mfg. Co.
 Detroit Copper Co.
 Elliott's Metal Co., Ltd.
 Consolidated Iron
 Shaft Iron Bridge Co.
 Seattle W. & Sons
 Sikes Steel Roofing Co.
 Vulcan Iron Works, Etc.
 Denver Fire Clay Co.
 Dixon, Jos. Crucible Co.
 Dampier Crucible Co.
 D'Este & Seelye.
 Cyanide.
 Roessler & Hasselacher Chemical Co.
 Diamonds
 Blau, Victor, & Co.
 Bostelmann, L. F.
 Lexow, Theodore.
 Diamond Drills
 Bishop, Victor, & Co.
 Bostelmann, L. F.
 Bullock Mfg. Co., M.C.
 Lexow, Theodore
 Sullivan Machinery Co.
 (See Air Compressors and Rock Drills.)

Dampers
 Young, Wm. R.

Drawing Materials
 Besley, Chas. H., & Co.
 Dietzen, E. & Co.
 (See Engineering Instruments.)

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

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

Educational Institutions
 Arizona School of Mines.
 Columbian University.
 Chicago School of Assaying.
 Riley, J. W.
 Lehigh University.
 Mass. Inst. of Technology
 Michigan Mining School.

Electrical Batteries
 Macbeth, James & Co.

Electrical Machinery and Supplies
 Besley, Chas. H., & Co.
 Denver Eng. Wks. Co.
 General Electric Co.
 Jeffrey Mfg. Co.
 Walker Mfg. Co.

Elevators, Conveyors, and Hoisting Machinery
 Hunt, C. W. Co.
 Jeffrey Mfg. Co.
 Joplin Machine Works
 Caldwell, H. W., & Co.
 California Wire Wks.
 Marvin Elec. Drill Co.
 Cooper, Hewitt & Co.
 Cross, W. A., & Bros. Co.
 Denver Eng. Wks. Co.
 Field & Goetzman.
 Fraser & Chalmers.
 (See Wire Rope Tramway and Machinery.)

Emery Wheels
 Besley, Chas. H., & Co.
 New York Belting & Packing Co., Ltd.

Engines, Steam, and Metallurgical
 See Directory Pages 4, 5 and 6.

Explosives and Supplies
 Heer, Peter
 Mann & Co.
 Seelig & Kandler.
 Umsch, T. F.

Fire-Brick and Clay
 Chur, A. T.
 Denver Fire Clay Co.
 Brown, Horace.
 (See Machinery.)

Fuses, Powder
 Ingersoll-Sergeant Drill Co.

Fuse, Safety
 Climax Fuse Co.

Gas Engines
 Dayton Gas Engine & Mfg. Co.
 Norman, J. J., & Co.

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

Gauges, Recording, Etc.
 Bristol Mfg. Co.

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

Grass, Graphite, Etc.
 Besley, Chas. H., & Co. | Dixon, Jos., Cruc. Co.

Heavy-Weight Steel
 Pierce & Miller Engineering Co.

Heavy Machinery
 Denver Eng. Works Co.
 Fraser & Chalmers.
 Howe, Knabner, Etc.
 New York Belting & Packing Co., Ltd.
 Penberthy 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
 Right 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.
 Baker & Co.
 Blake, T. A.
 Bostelmann, L. F.
 Boston Ore Mach'y Co.
 Bradley Pulverizer Co.
 Bucyrus Mfg. Co.
 Caldwell, H. W., & Co.
 Card Electric Co.
 Carpenter, Geo. H. & Co.
 Chas. H. & Co.
 Colorado Iron Works.
 Connersville Blower Co.
 Crandall & Huff.
 Crook, W. A., & Bros. Co.
 Davis-Colly Ore R. Co.
 Denver Eng. Wks. Co.
 Ellison, Wm., & Son.
 Engsbach W. Mfg. Co.
 Field & Goetzman.
 Fraser & Chalmers.
 Hammond, Mfg. Co.
 Hendrie & Bolthoff Mfg. Co.
 Ingersoll-Sergeant Drill Co.
 Jeffrey Mfg. Co.
 Johnson, W. & Sons, Ltd.
 Manganese Steel.
 Taylor Iron & Steel Co.

Metal Dealers
 American Metal Co.
 Am. Zinc Lead Co.
 Baker & Co.
 Bath, Henry & Son.
 Besley, Chas. H. & Co.
 Bridgeport Copper Co.
 Elliott's Metal Co., Ltd.
 Joplin Machine Works
 Foster, Blackett & Wilson.
 James & Shakespeare
 Johnson, Matthey & Co.
 Lambert's Wharf Co.
 Lewiston Bros. Co.
 Lorraine & Co.
 Metallurgical Works and Ore Processors
 Amer. Zinc Lead Co.
 Baker & Co.
 Riles, J. W. & Ref. Co.
 Baltimore Copper Co.
 Bridgeport Copper Co.
 Canadian Copper Co.
 Denver Eng. Wks. Co.
 Elliott's Metal Co., Ltd.
 Foster, Blackett & Wilson.
 Fraser & Chalmers.
 General Gold Extraction Co.
 Kindall Gold & Silver Extraction Co.
 Mine Cars
 Crandall & Huff.
 Denver Eng. Wks. Co.
 Hendrie & Bolthoff Mfg. Co.
 Hunt, C. W. Co.
 Nelsonville Foundry & Machine Co.
 Searfield Car Co.
 (See Machinery.)
 Miner, Mill and Smelters Supplies.
 Carpenter, Geo. B. & Co.
 Crandall & Huff.
 Denver Eng. Wks. Co.
 Gates Iron Works.
 Park & Williamson.
 Roessler & Hasselacher Chemical Co.
 Stieren, William E.
 (See Machinery.)

Mining and Land Companies
 Atlantic Mfg. Co.
 Arizona Copper Co.
 Boston & Mont. M. Co.
 Butte & Boston Mfg. Co.
 Clark Land & Mines Co.
 Copper Queen Mfg. Co.
 Canadian Copper Co.
 Ore Cars
 Truax Mfg. Co.
 Ore Crushers
 Brown, Horace F.
 Gunn, R. V., & Sons Co.
 Davis-Colly Ore Roaster Co.
 Ore Treating Works
 Hunt, F. F.
 Leontas & Co.
 Montana Ore Purchasing Co.
 Packing and Pipe Coverings
 Bradt, Randolph.
 Jenkins Bros.
 Hine & Robertson.
 Joplin Machine Works
 Fraser & Chalmers.
 Harrington & King Perforating Co.
 Peroxide of Sodium.
 Roessler & Hasselacher Chemical Co.
 Phosphor Bronze
 Photographs Smelting Co.
 Pipe Drivers
 Bucyrus Steam Shovel and Dredge Co.
 Ingersoll-Sergeant Drill Co.
 Pipes
 Pollock, Wm. B., & Co. | Wyckoff, A., & Sons.
 Plating
 Baker & Co.
 Johnson, Matthey & Co.
 P. W. der
 Atlantic Dynamite Co.
 Ingersoll-Sergeant Drill Co.
 Present Blowers
 Connersville Blower Co.
 Penberthy Injector Co.
 D'Este & Seelye. (Curtis.)
 Publications
 American Fertilizer.
 Allis & Sons
 Australian Mfg. Stand.
 Bulletin
 Colliery Guardian.
 Denver Republican.
 Economic Miner.
 Elmer & Amend.
 Electrician
 Electrical Industry
 Pumps
 Blake, Geo. F. Mfg. Co.
 Calver, A. S.
 Plumb Works.
 Denver Eng. Wks. Co.

Fraser & Chalmers. | Tod, Wm., & Co.
 Goude Mfg. Co. | Worthington, Henry

Surveying Machines
 Bostelmann, L. F.
 Ingersoll-Sergeant Drill Co.
 Rand Drill Co.
 Sullivan Machinery Co.

Quicksilver
 Sureka Co.

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

Railroad Supplies and Equipment
 Carpenter, Geo. B. & Co. | Hunt, C. W. Co.
 Denver Eng. Wks. Co. | Porter, H. K., & Co.
 Crandall & Huff. | Robinson & Orr
 Fairbanks Co. (See Machinery.)

Regulators, Damper, Heat, Etc.
 D'Este & Seelye Co.
 Eddy Valve Co.
 Jenkins Bros.

Return Steam Traps
 D'Este & Seelye. (Curtis.)

Rock Drills. (See Air Compressor.)

Roofing
 Berlin Iron Bridge Co. | Scaife, Wm. B., & Sons
 Denver Eng. Wks. Co. | Shiffer Bridge Co.
 Pittsburg Bridge Co. | Sikes Steel Roofing Co.

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

Scenes
 Fairbanks Co.

Screens
 Alchison, 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
 D'Este & Seelye Co.
 Chester Steel Cast. Co. | Fraser & Chalmers
 Columbia Steel Works | Pierce & Miller Eng
 Crenshaw Steel Co. | neering 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. | Orford Copper Co.
 Baltimore Copper Wks. | Penna. Salt Mfg. Co.
 Bridgeport Copper Co. | Penn Amelting and
 Elliott's Metal Co., Ltd. | Refining Works.
 Kan. City Sm. & Ref. Co. | Phoenix Smelt. Co.
 Mathison Smelting Co. | Smelt. Co.

Steam Traps.
 D'Este & Seelye. (Curtis.)

Steel Rails, Castings, Rolls, Drill Steel
 Bethlehem Iron Co. | Pierce & Miller Engi
 Carpenter Steel Co. | neering Co.
 Chester Steel Cast. Co. | Robinson & Orr.
 Chromite Wks. | (See Metal Dealers.
 Crandall & Huff. | Pollock, Wm. B. & Sons
 Garrison, A. F. Ry. Co. | Scaife, Wm. B. & Sons
 Mount, S. & Sons Co. | Taylor Iron & Steel Co.

Tanks
 Denver Eng. Wks. Co. | Jessop Wm. & Sons
 Gates Iron Works. | Ltd.
 Walker Mfg. Co.
 Williams Mfg. Co.

Telegraph Wires and Cables
 Okonite Co., Ltd., The.

Temperature Regulators
 D'Este & Seelye. (Curtis.)

Testing Laboratories
 Fairbanks Co.

Tubes
 Besley, Chas. H., & Co.
 Pratt & Whitney Co.

Tubing-Rubber
 Pollock, Wm. B. & Co. | Williams Bros.

Turbine Water-Wheels
 Stillwell-Bierce & Smith-Valle Co.

Typewriters.
 Wyckoff, Seaman & Benedict.

Valves
 D'Este & Seelye Co. | Fairbanks Co.
 Eddy Valve Co. | Scaife, Wm. B. & Sons

Valvulars
 Link Belt Mfg. Co. | Tod, Wm., & Co.
 Fraser & Chalmers.

Valvular Emery Wheels
 New York Belting and Packing Co., Ltd.

Water-Wheels
 Girard Water Wheel Co.
 Letell, James, & Co.
 Stillwell-Bierce & Smith-Valle Co.

Well Drilling Machinery
 Bostelmann, L. F.
 Sullivan Machinery Co.
 Williams Bros.

Wharfage
 Leontas & Wharfage Co.

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

White Lead
 Foster, Blackett & Co.

Wire Ropes
 Aitchison, R. Perf. Metal Co.
 Baunum, & T.
 Harless & King Perforating Co.

Wire Rope & Wire
 Besley, Chas. H., & Co. | Hunt, C. W. Co.
 Broderick & Sascom | Leontas & Sons
 Rope Co. | Rope Co.
 California Wire Wks. | Phelps, Lodge & Co.
 Carpenter, G. B., & Co. | R. B. J. A. Sons & Co.
 Carpenter Steel Co. | Rodways & Symonds.
 Channon, H. O. | Trenton Iron Co.
 Cooper Hewitt & Co.
 Wire Ropes
 Brown, H. & Co. | Huff, C. W. Co.
 Machine Co. | Rocking, J. A., & Sons
 California Wire Wks. | & Co.
 Colorado Iron Works. | Koppeways & Co. Ltd.
 Denver Eng. Wks. Co. | Vulcan Iron Works
 Fraser & Chalmers.

POSITIONS VACANT.

FREE ADVERTISING

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.

1450 CHEMIST WANTED FOR A VIRGINIA Furnace Works. Must work very accurate and be able to give proof of his ability. A good position for a good man. Address E. J. S., ENGINEERING AND MINING JOURNAL.

1451 WANTED -- A REVERBERATORY furnace foreman, one who understands the Welsh methods of copper smelting and refining to go to the West. Address, COPPER BOTTOMS, 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.

1454 WANTED--A CHEMIST, ONE WHO has had experience in the assay of silver-lead bullion, dore bars and argentiferous copper; a good salary will be paid to the proper man. Address BI-METALL, ENGINEERING AND MINING JOURNAL.

1455 WANTED--AN ASSAYER FOR SILVER department of smelting works. Must have had experience and be able to furnish testimonials as to ability and honesty. Address DENVER, ENGINEERING AND MINING JOURNAL.

SITUATIONS WANTED.

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

MINING ENGINEER (AGE 25) DESIRES engagement as assistant manager, chemist, assayer, or other suitable employment with mine or smelter after May 1st. Expert accountant. Address, P., ENGINEERING AND MINING JOURNAL. No. 17,385, April 25.

CHEMICAL ENGINEER AND MANAGER, American, with long and successful experience as above with large manufacturing concerns, will shortly be disengaged. Is a technical graduate and has an excellent record as a pushing organizer, developer and manager of manufacturing processes. Good executive and mechanical ability. Excellent references. Address A. X., ENGINEERING AND MINING JOURNAL. No. 17,399, May 2.

COMPETENT ASSAYER DESIRES SITUATION. Graduate Missouri School of Mines, '87. Can take charge of sampling works or assist mine manager. Address O. L., Denver office ENGINEERING AND MINING JOURNAL, 206 Boston Building, Denver, Colo. No. 17,386, April 25.

DOUBLE ENTRY BOOKKEEPER AND general office man of experience would like a position with mining company. Have lived several years in Western mining country. Can give best of references. Address MANSFIELD, ENGINEERING AND MINING JOURNAL. No. 17,397, May 2.

A COMPETENT SUPERINTENDENT OF fertilizers and acid works, desiring a change of location, would like to correspond with some manufacturer wanting such service. Best references. Address PHOSPHATE, ENGINEERING AND MINING JOURNAL. No. 17,390, May 2.

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. 17,393, May 2.

A COMPETENT ASSAYER AND CHEMIST of high grade technical school desires a position in a steel furnace or mine laboratory. Best of references and recommendations can be furnished. Has had practical experience. Address M. M. S., ENGINEERING AND MINING JOURNAL. No. 17,391, April 25.

CHEMIST AND ENGINEER (C. E. YALE, 1891), experience in field and office, taken degree Ph.D. in chemistry this June, wishes permanent location. Best references as to ability and energy. Address B. W. McF., 420 Temple Street, New Haven, Conn. No. 17,393, May 2.

METALLURGICAL CHEMIST AND ASSAYER desires position, preferably with smelting company. Competent and experienced furnace manager and rapid and accurate chemist. Proficient and systematic record keeper and is economical. Speaks Spanish. Good references. Address HABIL, ENGINEERING AND MINING JOURNAL. No. 17,398, May 10th.

Contracts Open.

PROPOSALS FOR TUNNEL.

The Iron Mountain Company will receive bids for the building or running tunnel at their mine in Missoula County, Montana, up to May 10th, 1896, dimension 6 by 7 ft., length 5,600 ft., specification and conditions will be furnished upon application at the office of the required company at Helena, Montana. R. S. HALE, President.

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., April 11th, 1896.--Sealed proposals will be received at this office until 2 o'clock p. m. on the 7th day of May, 1896, and opened immediately thereafter, for all the labor and materials and fixing in place complete the low pressure, return circulation, steam heating and ventilating apparatus required for the United States Post Office building at Fort Worth, Texas, in accordance with the drawings and specification, copies of which may be had at this office or the office of the Superintendent at Fort Worth, Texas. Each bid must be accompanied by 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 and 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 for opening will be returned to the bidders. Proposals must be enclosed in envelopes, sealed and marked, "Proposal for the Heating and Ventilating Apparatus, etc., for the United States Post Office building at Fort Worth, Tex.," and addressed to WM. MARTIN AIKEN, Supervising Architect. Orig.

BRIDGE.--Bids will be received at my office, in Hawkinsville, Ga., until the 6th day of May, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me at Hawkinsville, Ga. P. T. McGRUFF, Ordinary, Pulaski County, Ga.

WATER-WORKS.--Sealed proposals addressed to the City Clerk, Bluffton, O., will be received until April 27th, for furnishing material and labor and constructing a system of water-works for Bluffton, O. The work to be done is approximately as follows: 1. Furnishing f. o. b. Bluffton, O., about 245 tons of cast-iron pipe, and about six tons of special castings. 2. Laying of the above pipe, and setting all hydrants, valves and valve boxes. 3. Furnishing f. o. b. cars, Bluffton, O., 38 fire hydrants; also the necessary valves and valve boxes. 4. A pumping station. 5. A steam pumping plant of an easy capacity of 1,000,000 gallons per day, with boilers and all appurtenances. 6. A steel tank 22 ft. in diameter and 30 ft. deep, erected on structural steel tower 80 ft. in height. Bids will be received for the whole or any part of the above work, and the village of Bluffton, O., reserves the right to reject any or all bids. Accompanying each proposal must be a certified check, payable to the order of the City Treasurer of Bluffton, O., as a guarantee to be forfeited if the bidder fails to enter into the contract awarded to him; the amount to be 3% of the amount of the bid, provided no check be less than \$200. Plans can be seen at the office of Sanders & Porter, designing engineers, 908 Columbia building, Louisville, Ky., and at the office of W. H. EULLER, chairman of the Water Works Committee, Bluffton, O. All work to be paid for in cash. W. H. EULLER, Chairman, SANDERS & PORTER, Engineers, Louisville, Ky.

BRIDGE.--Bids will be received at my office in Hawkinsville, Ga., until the 6th day of May, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me at Hawkinsville, Ga. P. T. McGRUFF, Ordinary, Pulaski County, Ga.

BRIDGE.--Bids will be received at my office in Hawkinsville, Ga., until May 6th, 1896, for furnishing material and placing iron or steel viaducts to west side approaches to river bridge, at Hawkinsville, in lieu of present wooden structure. Total length of said approaches is about four hundred (400) feet. Bids are asked on two hundred (200) feet of same, with privilege of whole length. The right to reject any or all bids is reserved. For further particulars address me at Hawkinsville, Ga. P. T. McGRUFF, Ordinary, Pulaski County, Ga.

NOTICE TO CONTRACTORS--City of Boston, Boston Transit Commission.--Sealed bids for building Section 6 of the subway in Tremont street, from Park street to Scollay square, in accordance with the form of contract and specifications to be furnished by the Commission, will be received at its office, 20 Beacon street, Boston, Mass., until 12 o'clock M., of Thursday, May 7, 1896. The section is in a crowded street in the heart of the city; street railway tracks traverse its lengthwise and there are numerous important buildings on each side. It is intended that most of the work shall be done by tunneling, and little of the surface can be occupied during the day. The section is approximately 1,085 ft. long. The subway from Scollay square to Hamilton place, a distance of about 1,035 ft., will consist of masonry side walls and a masonry arch springing therefrom, spanning two tracks. From thence to the junction with the work already built in front of Park street church, there will be two single-track subways, of construction similar to that of the two-track portion--each being about 50 ft. long. The inner dimensions of these subways will be approximately as follows: Two track, 18 ft. in height from invert, 23-ft. span; easterly single track, 16 ft. in height from invert and 13-ft. span; westerly single track, 16 ft. in height from invert and 15 ft. span. The depth from the surface of the street to the bottom of the subway is approximately from 24 to 35 ft. Some other items are estimated to be as follows: 28,000 cu. yds. of earth excavation; 125 tons iron and steel, furnished by the commission, to be set in place; 10,800 cu. yds. concrete and brick masonry.

Plans can be seen and specifications and forms of contract can be obtained at 20 Beacon street, fifth floor. A bond will be required for the faithful performance of the contract in a sum of 20 per cent. of the amount. The commission reserves the right to reject any and all bids. GEORGE G. CROCKER, Chairman; CHARLES H. DALTON, THOMAS J. GARGAN, GEORGE F. SWAIN, ALBERT C. BURRAGE, Boston Transit Commission; HOWARD A. CARSON, Chief Engineer; B. LEIGHTON BEAL, Secretary.

BRIDGE.--Office Commissioners of Roads and Revenues, Fulton County, Georgia, Atlanta, Ga.--Sealed proposals will be received at this office until the 5th day of May, 1896, for furnishing all material and labor and building complete, ready for use, the Bridge over Peachtree Creek on Peachtree road, about five miles from the City of Atlanta, in accordance with plans and specifications prepared by Grant Wilkins, Engineer, copies of which can be had by bidders upon application to the undersigned or to the Engineer. Each bid must be accompanied by a certified check for the sum of Two Hundred and Fifty Dollars, payable to C. A. Collier, Chairman, Commissioners of Roads and Revenues of Fulton County. The right is reserved to reject any or all bids. All proposals to be addressed to the undersigned, and must be made upon the blank form for proposal attached to the specifications. ANTON L. KONTZ, Clerk, Commissioners Roads and Revenues for Fulton County, Atlanta, Ga.

PUMPING ENGINE.--Office Board of Trustees of Water-Works, Sandusky, O.--Sealed proposals will be received at the office of this Board, in the city of Sandusky, O., until the 1st day of May, 1896, for remodeling a 3,000,000-gal. pumping engine now in the pumping station of the water-works of said city, according to specifications therefor, which are on file in the office of said Board. All proposals must be on blanks which may be obtained at the office of the said Board. Each bid must be accompanied by a certified check, drawn to the order of the Secretary of said Water-Works, in the sum of \$300, as surety that if the bid is accepted a contract will be entered into. The right is reserved to reject any or all bids. P. J. CROSEN, President; ADAM KOLB, J. O. DEHNEL, Trustees; C. A. JUDSON, Superintendent.

THE ENGINEERING AND MINING JOURNAL. ADVERTISING RATES. (NONPAREIL MEASUREMENT.) Table with columns for Line, Inches, Regular, One Month, Three Months, Six Months, Nine Months, Twelve Months, and Full Page. Includes SPECIAL POSITIONS section at the bottom.

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Auction of Wallace & Sons' Copper and Brass Rolling Mills, Etc., at Ansonia, Conn.

To close a Trust, the real estate, buildings, machinery, plant, tools, material and shares of stock of **WALLACE & SONS**, will be sold by auction at their office in Ansonia, at noon on Thursday, May 14th, 1896, unless previously disposed of at private sale.
The property includes Brass and Copper Wire Mills, Brass and Copper Rolling Mills, Casting Shop, Lamp and Burner Shops, Pin, Rivet and Chain Machinery, with auxiliary shops and Buildings, and all now running.
The property also embraces: 1 double tenement, 2-story, on Fourth St., all at Ansonia; about 741 acres woodland in Newton; about 61 1/2 acres woodland in Ansonia; about 12 acres woodland in Seymour. Also the following shares of stock, viz.: 8,000 shares Parrot Silver & Copper Co. stock; 240 shares American Fish Hook Co. stock.
The manufacturing plant and land and buildings connected with it will be sold in one lot, if started at a bid to be fixed at the sale, which will be less than one-half the value recently appraised by Messrs. Brooker and Paine. Otherwise in lots as per Catalogue.
TERMS: 10 per cent. cash or acceptable cheques at sale and remainder upon delivery of deeds within 30 days. Possession to be retained until delivery of deeds and as much longer as may be necessary to complete existing contracts, if purchaser at the sale does not elect to assume them.
Catalogues of the property in detail may be had by addressing **Wallace & Sons, 29 Chambers St., New York.**
The Trustees reserve the right to sell all or any part of the property at private sale before the auction.
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CONTRACTS OPEN.

Continued from Page 18.

CEMENT, ETC.—U. S. Engineer Office, Montgomery, Ala.—Sealed proposals for furnishing and delivering cement, broken stone, pebbles, steel I-beams, steel bolts, iron bolts, and bronze castings at U. S. Engineer wharf, Pensacola Harbor, Fla., will be received here until April 29th, 1896. Information furnished on application. **F. A. MAHAN,** Major Engrs.

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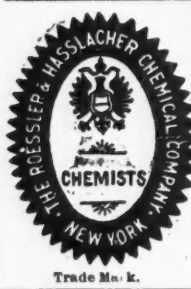
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