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AND
COAL

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By an unfortunate mistake of the types last week we were made to give the total bituminous coal production of Pennsylvania for 1893 at 49,942,532 short tons. The correct figure is 42,942,532 tons, which shows a decrease of 3,634,044 tons from the output of 46,576,576 tons recorded for 1892. This error was in the types only, and does not change the total then given for the United States of 181,319,490 short tons, or 920,473 tons more than in 1892.

The memorial presented to the British Government by the London Chamber of Commerce, which we quote in another column, shows the extent to which British merchants have begun to realize the injury done to their trade by the monetary policy which has been followed by the government. It is another sign of the new movement toward an international understanding on the currency question which, we believe, is sure to increase in force and volume, and finally to secure some action to settle this all-important question by international agreement.

In our comments on the Bland bill for coining the seigniorage on the silver in the Treasury, last week, the objections to the proposed action were stated, so that little further remark is now needed. As had been generally anticipated, the bill has failed to become law, the President having vetoed it on Thursday of this week. In his message, which goes over the objections to the bill at some length, the President names two grounds for his action, the looseness with which several of the provisions are drawn, and the inherent defects of the bill itself, the enactment of which, he believes, would have a very unfavorable effect on our credit both at home and abroad, would indicate a disposition to return to a policy which has been already discredited, and would be a serious injury to the cause of true bimetallism. While somewhat more guarded in its terms than some had expected, the veto message is still sufficiently emphatic, and shows that no so-called silver legislation will meet with Executive approval. There is no probability of a passage of the bill over the veto, but the silver monometallists are discussing various schemes to secure its passage in some other form, none of which, however, seems a present likely to succeed.

The French iron trade last year, while it did not increase over the preceding year, showed only a decrease so small that it may be said to have been substantially the same in 1893 as in 1892, therein differing materially from that of England and the United States. The total production of pig iron of all descriptions last year was 2,032,567 metric tons, a decrease of only 24,691 tons, or 1·2 per cent., the falling off being chiefly in foundry iron and Bessemer pig. The production of wrought iron in its various forms increased very slightly, having been 829,851 tons last year; the increase was only 1,332 tons, or 0·15 per cent. Steel, on the other hand, showed a decrease, the output of ingots, including Bessemer, basic and open-hearth, having been 803,063 tons, and showing a decrease of 22,423 tons, or 2·5 per cent., from 1892. The production of finished steel decreased in nearly the same proportion; it was 668,665 tons; 13,862 tons, or 2·1 per cent., below that of the preceding year. In this respect France showed a variation from the experience of the leading iron-producing countries, in which the tendency is toward an increase of the steel output in greater proportion than that of wrought iron.

The coal production for the year 1893 was 25,738,073 metric tons, a decrease of 440,628 tons, or 1·7 per cent., from 1892. Most of this reduction is accounted for by a somewhat lighter demand from the iron mills and other factories. About 3 per cent. of the total production was of brown coal, or lignite. Over half the total output—13,845,419 tons—was from the districts of the Nord and Pas-du-Calais. No great increase in French coal production is probable, as the coal measures are now pretty well known and thoroughly worked.

The French ironmasters, like their brethren elsewhere, have had to complain of low prices, the general tendency through the year having been to a decline. This has generally resulted in cutting profits, as no marked economies in working have been recently secured.

THE MINERAL AND METAL PRODUCTION OF THE UNITED STATES.

The following preliminary statement of the mineral production of the United States in 1893, though still subject to revision, represents in nearly all cases the final official returns of every producer of the substance named. These statistics have been collected for the second volume of "The Mineral Industry: Its Statistics, Technology and Trade," which is now in press, and while they might have been published some time ago, their final revision is left to the last moment in order to embody any changes the producers may find it necessary to make in their first returns.

The universal courtesy extended to us by those engaged in the industry in giving statistics of production and other valuable information has been extremely gratifying. With but a very few exceptions, every producer of minerals or metals in America, and all the important producers in Europe, have aided us in this great work and have thus insured its successful accomplishment.

The returns for 1892 have been checked again this year, and the few

and small changes made in them as published in Volume I. of "The Mineral Industry," are a proof of the general accuracy and reliability of that work.

MINERAL PRODUCTION OF THE UNITED STATES IN 1893.

Product.	Cust. Measures.	1892. Cust. Measur's.	1892. Metric tons.	1893. Cust. Measure.	1893. Metric tons.
NON-METALLIC:					
Asbestos	Short tons	100	91	120	109
Antimony ore	Short tons.	850	771	850	771
Asphaltum and Asp. rock	Short tons.	47,040	42,675	34,944	31,701
Barytes (crude)	Short tons.	28,476	25,833	26,632	24,161
Bauxite	Short tons.	9,800	8,891	11,044	10,106
Borax	Pounds.	12,538,196	5,687	8,699,000	3,946
Bromine	Pounds.	379,480	172	348,399	158
Cement, hydraulic	Bbls ,300-400 lb.	8,211,181	.....	7,503,385	.....
Cement, Portland	" "	547,440	.....	596,531	.....
Coal, anthracite	Long tons.	46,850,405	47,352,696	48,044,834	48,818,356
Coal, bituminous	Long tons.	114,220,101	116,051,015	113,847,568	115,680,514
Coke	Short tons.	12,010,829	12,204,203	9,792,330	9,949,986
Cobalt, oxide	Pounds.	8,601	kilos 3,900	3,893	kilos 1,766
Copperas	Short tons.	13,250	12,021	16,000	14,515
Corundum	Short tons.	1,504	1,364	1,747	1,585
Chrome ore	Long tons.	1,650	1,677	1,620	1,646
Feldspar	Long tons.	16,700	16,258	17,000	17,274
Flint	Long tons.	37,000	37,598	38,000	38,612
Fluorspar	Short tons.	9,000	8,165	9,700	8,800
Grindstones	Short tons...	.....	.....	45,580	41,350
Infusorial earth and tripoli	Short tons.	1,323	1,200	1,709	1,550
Limestone, for iron flux	Long tons.	4,560,000	4,633,416	4,551,000	4,624,000
Magnesite	Short tons.	1,402	1,272	1,143	1,037
Manganese ore	Long tons.	19,117	19,425	9,150	9,297
Marls	Short tons.	125,000	113,400	110,000	99,792
Mica	Pounds.	75,000	34	75,000	34
Onyx	Cubic feet.	3,500	.....	2,175	.....
Ozokerite (refined)	Pounds.	130,000	59	None.	None.
Petroleum	Bbls., 42 gals.	50,512,136	7,000,982	50,349,228	6,978,103
Phosphate rock	Long tons.	902,723	917,257	983,340	999,174
Plumbago (refined)	Pounds.	1,398,363	634	896,603	406
Plumbago (crude)	Short tons.	900	816	1,500	1,361
Pyrites	Long tons.	106,250	109,937	95,000	96,526
Salt	Bbls., 280 lbs.	11,781,364	1,512,123	11,435,457	1,452,388
Slate (for roofing)	In squares.			87,500	
Soapstone	Short tons.	23,208	21,054	20,160	18,235
Soda, natural	Short tons.	3,300	2,994	2,500	2,269
Sulphur	Short tons.	1,825	1,656	1,344	1,219
Talc (fibrous)	Short tons.	41,925	38,034	36,500	33,113
Venetian Red	Short tons.	4,205	3,815	3,830	2,475
METALLIC:					
Antimony	Short tons.	200	181	350	318
Copper	Pounds.	325,500,000	147,047	322,585,500	146,324
Gold	Troy ounces.	1,596,373	kilos 49,632	1,731,700	kilos 54,110
Pig iron	Long tons.	8,977,869	9,122,413	7,043,334	7,156,752
Lead	Short tons.	205,630	186,618	193,928	175,931
Nickel	Pounds.	96,169	kilos 43,614	25,898	kilos 11,745
Quicksilver	Flasks, 76½ lbs.	27,993	971	30,154	1,046
Silver	Troy oz.	65,000,000	kilos 2,022,195	60,500,000	kilos 1,881,732
Spiegeleisen and Ferro-mang	Long tons.	179,131	182,015	81,118	82,424
Tin	Pounds.	143,400	65	None	None
Zinc	Short tons.	84,082	76,279	76,255	69,178

It is not necessary here to discuss at length these statistics; this will be done, and the figures of a few substances not here quoted, as well as the values of the whole, will be given in the forthcoming volume, where will also be found the technology of most of the mineral products.

Notwithstanding the depressed condition of trade during the last half of 1893, our mineral industries have maintained in most cases the maximum output of previous years. The one important exception to this has been in iron and steel, which lost heavily during the latter part of the year; but as an offset to this the output of coal was actually greater than ever before in the history of this country.

The facts here recorded demonstrate again the irrepressible industrial activity and enterprise of our people and the unmeasurable richness of our natural resources. Even the silver industry, which we were told was utterly destroyed by the low prices of the metal, makes a showing that is remarkable, the output of refined metal produced from native ores being but 4,500,000 ounces less than in 1892, when the output (65,000,000 ounces) was the largest in history. The great output in 1893 is not to be considered as a proof that the silver industry has prospered at the prices ruling during that year, for it was largely due to the fact that mines, smelters and refiners all "cleared up" the stocks they had, in anticipation, in many cases, of closing down their works. The total actual production was 60,500,000 ounces in 1893, which at 78·2 cents, the average price of the year, gives a value of $47,311,000.

While a moderate amount of silver will continue to be produced from bonanza mines and as a by-product in copper, lead and gold production, even if the present or lower prices should prevail, nevertheless it is certain that the output of silver must steadily decline while these prices obtain, and it is probable that the year 1894 will see a still heavier falling off than did 1893 in the production of the white metal.

The output of gold, though larger by nearly $3,000,000 than in 1892, did not increase as much as was anticipated. Since the increased attention devoted to gold production has been due to the depression in silver mining which became serious only in the latter half of 1893, so that the output could not at once show the effect of this diversion of labor, the moderate increase is clearly explained. It is certain that the year 1894 will show a very much larger output of gold, which may be expected to reach fully $40,000,000 during the current twelve months.

The United States will undoubtedly retain the first position as a gold producer during 1894 and probably during 1895, after which date, unless conditions not now apparent should interfere, it seems probable that South Africa will take the first place. It is possible, however, that the present active search for gold in this country may discover or develope such extensive deposits as will enable us to retain for some time longer the pre-eminence so long held by us as the world's chief producer of the yellow metal.

In any event, the world's output of gold is increasing rapidly, and that of silver is decreasing. As has been predicted for two years past in the "Engineering and Mining Journal," the conditions of production tend to reduce the product ratio of silver to gold; and were it not for adverse legislation by European countries—against which it were folly for one country to stand alone, as we attempted to do—the maintenance of the concurrent circulation of gold and silver at even 16 to 1 would have presented no serious difficulties for some years yet, though the greater profit in producing silver when its value was one-sixteenth that of gold would inevitably in time have rendered the maintenance of that ratio impossible.

The present and prospective increase in the production of gold is wholly inadequate to compensate for the general cessation in the use of silver as money, so that the value of gold as measured by its purchasing power will doubtless steadily, and may at any moment suddenly, increase unless some international measure for Universal Bimetallism be adopted.

The danger and depression which the silver question threatened and actually caused to our American industries has passed. Our unlimited natural resources, as illustrated in these tables, offer a sufficient field for the exercise of the marvelous enterprise of our people. We will draw the capital, the gold of the world, to the profitable development of these resources and have nothing to fear, whatever may be the future of the white metal; but if the value of silver should continue to decline, as it must do if its sole important use continue suspended, then the future is pregnant with immeasurable danger and disaster to the nations which live by manufacturing for the silver basis countries, and whose revenues are largely derived from the interest to them for gold loaned those who possess only a money whose value is rapidly disappearing.

Considering the panic brought on us through fears engendered by our unwise financial legislation and the apparent collapse of many industries during the year, this table of our mineral and metal production is not only highly satisfactory and encouraging, but it is an irrefutable demonstration of the sound and solid foundation on which our industries are based and is the best guarantee of a prosperous and magnificent future.

BRITISH IRON AND STEEL PRODUCTION IN 1893.

The statistics of the British iron and steel trade, which have just been issued by the British Iron and Steel Association, show a small increase in the production of 1893 over that for 1892, but still considerably less than the output in 1891. The following table shows the production of pig iron by districts:

District.	1892. (Tons of 2,240 lbs.)	1893. (Tons of 2,240 lbs.)	Furnaces in blast.	Annual output per furnace. Tons.
Cleveland	1,937,459	2,724,184	85	32,049
Scotland	977,213	783,867	53	14,790
Cumberland	574,216	580,884	19	31,099
Lancashire	591,976	593,488	20	29,674
South Wales	683,300	679,595	22	30,890
Lincolnshire	212,079	191,316	10	19,131
Northampton	161,956	142,282	10½	13,550
Derbyshire	241,842	157,973	15	10,518
Notts and Leicester	276,174	201,357	13	15,489
N. Stafford	238,846	190,365	15	12,651
S Staffs and Worcester	346,725	329,431	24	13,734
S. and West York	244,742	155,598	13	11,969
Shropshire	50,107	38,441	5½	6,989
North Wales	45,573	30,527	3	10,176
Other districts	34,613	27,533	2	13,766
Totals	6,616,890	6,829,841	310	24,032

The production in 1891 was 7,406,374 tons, so that while that of 1893 is 212,570 tons greater than 1892, it is 576,533 tons less than 1891. The product in the first half of 1893 was 3,664,580 tons, and in the last half 3,165,000 tons, showing a decrease in the latter of 499,000.

The table shows that there was a material increase in the Cleveland district, due to a recovery of ground lost during the Durham coal strike in 1893. The district held its own in both the early and in the last half of the year, the output showing but little change. Scotland shows a marked decline in production, owing to the fact that many furnaces were blown out because of the Midland strike, and also, in the latter part of the year, on account of local strikes among coal miners. Cumberland and Lancashire show a slight increase, but the product in both is much below that of 1891, because of the Durham strike in 1892 and the low price of iron in 1893. There was also a marked reduction in output during the last half of the year. In the other districts there was a considerable reduction, particularly in Derbyshire, Northamptonshire, Lincolnshire, Notts and Leicester, South Staffordshire, South and West Yorkshire, these being the sections most directly affected by the coal strike.

Stocks of iron have increased in some districts and diminished for others, the total showing a decrease from 872,095 tons in 1892 to 868,730 tons in 1893, a difference of 3,365 tons.

The number of furnaces in and out of blast in 1891, 1892 and 1893 is as follows:

1891			1892			1893		
In.	Out.	Total.	In.	Out.	Total.	In.	Out.	Total.
355	371	726	351	382	733	310	385	695

In the production of acid and basic Bessemer steel there was a decrease of 7,356 tons in 1893. The production, by districts, was as follows:

	1892. Tons.	1893. Tons.
South Wales	414,959	367,405
Cleveland	312,775	373,702
Sheffield	236,937	215,288
West Cumberland	227,984	276,742
Lancashire and Cheshire	214,352	193,722
Scotland, etc	93,803	66,595
Total	1,500,810	1,493,454

Of this, 1,230,992 tons were acid and 262,362 tons basic steel. The average number of converters at work was 47·6 acid and 14·3 basic, a total of 61·9, and those not operating 35·4 acid and 6·7 basic, a total of 42·1, making a total of 83 acid and 22 basic converters, the average production of ingot being 23,970 tons per converter. The steel rail production is slightly more than in 1892, amounting to 579,386 tons, against 535,836 tons in the latter year.

Comparing British production with the output in the United States, we find that in 1892 our production of pig iron was 2,540,110 tons greater than that of Great Britain, during 1893 it was but 294,661 tons more. This decrease was almost entirely in the last half of the year, when our output was 43 per cent. less than in the first half, while in Great Britain the decrease in the same period was but 13 per cent. The slight diminution in stocks of pig iron in Great Britain would indicate a steadier demand then than in this country, when the stocks increased from 506,116 tons on December 31st, 1892, to 662,068 tons December 31st, 1893.

The difference between the number of furnaces in blast and their average output for the year is most marked. In Great Britain 310 furnaces produced an average each of 22,032 tons. In the United States 137 furnaces produced on an average 52,003 tons each. In production of steel, the United States made 4,168,435 tons in 1892 and 3,123,524 tons in 1893, showing a decrease of 25 per cent., whereas Great Britain shows a decrease of less than 1 per cent. The steel rail production in Great Britain declined but little, whereas in this country there was a decrease of 28 per cent., our production in 1893 being 1,036,353 tons.

It is not possible to draw any conclusions from the comparative figures of the two countries. Great Britain has for two years suffered from continual strikes, and in this country during the last half of 1893 we had a period of marked and almost unexampled industrial depression in the iron trade. Had our pig production continued in last half of 1893 in the same proportion as during the first half, the output would have been over 9,000,000 tons, or about as much as in 1892. The same may be said of the other branches of the iron industry, both steel and steel rails suffering the greatest decline in the last six months of the year. In Great Britain there seems to have been a recovery in the iron trade which was retarded both by the coal strike and by the unsatisfactory business conditions prevailing during the latter part of the year. Taken as a whole, the iron trade in that country has held its own remarkably well during 1893, but, of course, it will never reach the figures of production attained in this country.

BOOKS RECEIVED.

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

Cheap and Rapid Coaling in Nova Scotia. Halifax, N. S.; the Canadian Colliery Guardian Company. Pamphlet, pages 8.

Annual Calendar of McGill College and University. Session 1893-94. Montreal, Canada; printed for the University. Pages 268.

Handbook of Gold Milling. By Henry Louis. London, England; Macmillan & Co. Pages 504; illustrated. Price (in London) 10 shillings.

Transactions of the American Institute of Electrical Engineers. Volume X., 1893. New York; published by the Institute. Pages 720; illustrated.

Master Car Builders' Association: Report of Thirty-seventh Annual Convention, 1893. Chicago; published by the Association. Pages 410; illustrated.

Surveying and Surveying Instruments. By G. A. T. Middleton. London; Whittaker & Co., and New York; Macmillan & Co. Pages 116; illustrated. Price $1.25.

Indiana: Department of Geology and Natural Resources. Eighteenth Annual Report. By S. S. Gorby, State Geologist. Indianapolis, Ind.; State Printers. Pages 356; illustrated.

Practical Guide for Prospectors, Explorers and Miners. By Cuninghame Wilson Moore, London, England; Kegan Paul, French. Trübner & Co., Limited. Pages 286; illustrated. Price (in London), 12 shillings.

Compulsory Insurance in Germany: Fourth Special Report of the Commissioner of Labor. Prepared by John Graham Brooks under the direction of Carroll D. Wright, Commissioner. Washington; Government Printing Office. Pages 472.

CORRESPONDENCE.

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

The Mount Jefferson Gold Mining Company of California—Information Wanted.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: Can you or any reader inform me what has happened to the Mount Jefferson Gold Mining Company, California? The company is mentioned in Skinner's "Manual" of 1893, but not in 1894, and all the directors refuse to give any information. About £10,000 was obtained from the public here, and naturally some fuss is being made. A shareholder has asked me for particulars. If any information is available it would be of value. EDWARD WALKER.

LONDON, March 21, 1894.

A New Aluminum Phosphate Mineral.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: I desire to report the occurence of a somewhat interesting mineral in Utah Territory. From time to time during the past three years I have found small trinkets of this mineral buried in the ruins of prehistoric houses throughout the Territory. But, not until within a few months was it known from what locality the material had been obtained. About last December Mr. Ross, of Lehi, discovered the mineral in a place in Utah County near the Camp Floyd Mining District. It occurs in a thin seam, and is often in nodules, which, when broken through, show a beautiful pale-green color. The mineral in question is essentially a hydrous aluminum phosphate. Both Prof. H. L. Wells, of the Sheffield Scientific School, and myself have found traces of chromium in it. It is compact and has very little luster. In thin pieces it is translucent. Its hardness is 5, and its specific gravity is 2.6. When heated it speedily assumes a violet or pinkish color; whereas, turquoise, a mineral closely allied to it, when similarly treated, assumes a brownish color. This pretty green mineral is distinguished by several characters from the various aluminum phosphates, such as trolleite, fischerite, planerite, evansite, zepharovichite, peganite, wavellite, turquoise and others that could be mentioned. But it seems to be somewhat more closely related to turquoise than any other yet known, the difference being in hardness, the absence of copper and the color it assumes when heated. However, as copper is by some regarded as a non-essential ingredient of turquoise, the percentage varying greatly and frequently, this new Utah mineral may perhaps be looked upon as a variety of turquoise. It is capable of receiving a high polish, and may possibly come to have a commercial value if it be found in flawless specimens of sufficient quantity. HENRY MONTGOMERY.

UNIVERSITY OF UTAH, March 28, 1894.

Canadian Mining Schools.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: It was with much surprise that we read in your issue of March 17th the statement that the "first mining school in Canada" had recently been opened in Kingston, Ont., with 50 students; a departure quite new in this country. I do not think that this should pass unnoticed, as it is unjust to other mining schools that have been doing good work in Canada for many years and that certainly cannot be equaled in facilities and experience by any "new school" that may try to advance its own interests by claiming to be the first and only school in this country offering a course in mining engineering.

At McGill University, Montreal, there has been in the faculty of applied science, since 1879, departments of mining engineering and practical chemistry, from among the graduates in which many are holding high and responsible positions in American mining centers, or have been called further afield, as to Spain, Ceylon, Borneo, etc., of whom allow me to name, as I may remember: W. F. Robertson, New York, specialist in copper; E. P. Mathewson, superintendent; W. H. Howard, assistant superintendent, and W. J. Hamilton, chief chemist, Pueblo Smelting and Refining Company; J. W. Spencer, director Geological Survey of Georgia; C. A. Molson, manager Elkhorn Mining Company, Montana; Dr. R. Ells, R. G. McConnell and A. P. Low, of the Geological Survey of Canada; Dr. F. D. Adams, professor of geology, McGill University, and others.

The mining course at McGill embraces a thorough training in mathematics first of all, then in drawing, mechanism, physics, surveying, designing, hydraulics and applied mechanics. In the extended courses of chemistry, geology, mineralogy, blowpiping, the work is made particularly pertinent to the mining engineers' needs by professors thoroughly cognizant of the character of such needs. Besides the laboratories and museums, collections for these branches are supplied as none other in Canada. In assaying much practical work is done by students after the latest and best methods, and in the drafting-rooms, drawing, platting, mapping and designing receive special attention. In mining and metallurgy the lectures are based upon the best known and approved methods and processes as now obtain in American practice, by a graduate who spent several years in the largest mines in Colorado. Besides the regular college course, there is an active mining society at which we have been greatly favored by excellent papers and addresses from gentlemen now engaged in such work, and also from our own students who wrote from their experience gained during the long summer vacations spent working in mines or mills in different mining localities.

By reason of the recent gifts to the McGill faculty of applied science of buildings and equipments not surpassed on this continent, our mining students are reaping many advantages from the increased staff of trained professors, and from the superb laboratories for testing materials for hydraulics and electrical work. It is confidently expected that, at a now early date, completely equipped metallurgical laboratories will be added that will equal those of any mining school in America.

While wishing our friends at Kingston all success, we feel we cannot let such a misstatement pass unchallenged or unrebuked, being, as it is, most uncalled for and in exceedingly bad taste for a new school to try continually, through the press, to ignore the existence of mining schools at Montreal and Toronto that possess the great advantages of much longer experience and superior equipment. W. A. CARLYLE.

MONTREAL, March 24, 1894.

COAL, IRON AND STEEL PRODUCTION IN FRANCE.

The reports of production of coal and iron in France during 1893, which has just been returned to the Ministry of Public Works, shows that 25,249,731 metric tons of coal and 488,342 tons of lignite were mined, making a total of 25,738,073 metric tons of fuel, as against 26,178,701 tons in 1892. This shows a decline of 440,628 tons. The production is divided as follows: Nord and Pas de-Calais coal-field, 13,845,419 tons; Loire field, 3,552,687 tons; Gard, 2,006,780 tons; Bourgogne and Nivernais fields, 1,966,954 tons; Tarn et Avignon field, 1,419,705 tons; Bourbonnais, 1,166,701 tons; Auvergne, 339,666 tons; Vosges Meridionales, 221,761 tons; Herault, 205,383 tons; Creuse et Corrèze, 205,099 tons; Alpes Occidentales, 174,110 tons; and Ouest, 145,466 tons.

The production of pig iron in 1893 was 2,032,567 metric tons, as compared with 2,057,258 metric tons in 1892 and 1,897,387 tons in 1891, thus showing a decrease of 24,691 tons from the product in 1892, but an advance of 135,180 tons over the production in 1891. The total output consisted of 1,551,131 tons forge iron and 481,436 tons foundry iron.

The production of finished iron in 1893 was 829,851 tons, against 828,519 tons in 1892, showing an advance of 1,332 tons. The total quantity of steel produced by the Bessemer and Siemens-Martin processes in 1893 was 803,063 tons, as against 825,486 tons in 1892, showing a decrease of 22,423 tons. The total quantity of finished steel in the former year was 668,665 tons, against 682,527 tons in 1892, showing a decrease of 13,862 tons, in rails and plates, while merchant bar increased.

ABSTRACTS OF OFFICIAL REPORTS.

THE BROKEN HILL PROPRIETARY COMPANY, NEW SOUTH WALES.

The report of this company for the half year ending November 30th, 1893, states that 260,047 tons of ore were treated during that period, showing an extraction of about 10% of lead and 25 oz. of silver per ton, and producing 333 tons of copper (in matte); 25,822 tons of lead, 1,431 ozs. gold, and 6,533,232 ozs. of silver, equal to 25,278 oz. of silver per week. Of the total amount of ore mined, 101,912 tons were obtained by open out quarrying. The cost of extracting this ore was $2.37 per ton, which is 48 cents less than this work cost during the previous half year.

A plant is at present being constructed for the treatment of ores by the chloridising process and it is expected that it will all be in operation early in the year.

The works are designed for the treatment of low and medium grade silicious ores which are unfit for smelting and constitutes a preliminary treatment for the subsequent leaching; consequent upon the starting of the chloridising plant the leaching department, which has been idle for a considerable time past, will be again set to work. The leaching plant is in good order, with the exception of some slight repairs. A railway siding has been put in to take the chloridised mineral to the leaching works and will cheapen the treatment of these ores. The company contemplates building new concentrators of a more suitable type and adapted to the dressing of the sulphite ores.

The refinery, during the six months, has treated 11,309 tons of bullion, and produced 11,335 tons of soft lead, 237 tons of copper in matte, 1,578 oz. of gold, and 3,284,508 oz. of silver. The cost of refining averages $7.705 per ton; this is rather more than the previous half year owing to some rather base bullion having been sent to the refinery.

An adequate and regular water supply is assured by the completion of the Stephens Creek Water Works.

A new smelting furnace at Port Pirie, and a small blast furnace for treating copper matte, have been added to the plant.

The cost of treating ores at the several smelting works is as follows: Port Pirie Smelting Works, $4.375; Port Pirie Refinery Furnace, $5.975; mine furnaces, $6.68; furnaces rented from British Company at Broken Hill, $5.54.

It has been decided to double the present working capacity of the refinery, and plans and specifications are being prepared for the new machinery which will shortly be ordered. Little additions to the present building and no additional power will be used.

The balance sheet presented in the report shows a net profit for the half year of $2,177,335, out of which a sum of $1,282,400 has been distributed in dividends, and $144,000 added to the reserve fund, thus increasing it to $528,000. The net assets of the company, after deducting all outstanding liabilities, were $1,912,370 in amount.

ELKHORN MINING COMPANY, LIMITED, MONTANA.

The annual report of this company is made to the stockholders in London, and receipts, etc., are stated in sterling; the last report is for the year ending December 31st, 1893. The receipts from sales of bullion and ores were £104,157; sundries, £857; total, £105,014. Mine charges were £58,951; office expenses in London, £1,990; taxes and exchange, £2,334; a total of £63,275, leaving a surplus of £41,739. Adding balance from 1892, which was £7,714, makes a total of £49,453, which four dividends were paid, £43,752 in all, leaving a balance of £5,701 on hand. The result was obtained in spite of the financial crisis and the heavy fall in price of silver. The dividends paid were 5s. per share, or 25%. From the commencement of operations to the end of 1893, a period of 3 years and 10 months, the company paid in dividends a total of £246,430, or 132% on the stock. Last year £1,144 was added to capital account for new pumping plant.

The report of Mr. C. A. Molson, manager of the mine, says: "The general results of the year's work have fully borne out the estimates of ore in sight made by Captain Plummer in January, 1893, and although the strong opposition to silver, the essential product of the mine, has so reduced the net values as to make it unprofitable to treat the lower grade ores as in former years, we have still been able to make returns which are satisfactory when the conditions prevailing during the past six months are considered. The policy of keeping the development work well ahead of our requirements has been steadily adhered to during the past year. The most interesting and important points in this connection are the driving of the several north drifts at and below the 750-ft. level, where they were left in barren ground by the old company, and the sinking of the main shaft to the 1,550-ft. level with the drifts run from this point. All of this work has resulted in the discovery of profitable ore-bodies. The occurrence of the ore in the lower part of the mine shows the same general characteristics met with on the upper levels. The silicious, or dry ores, form the mass of the contact chutes, while the chambers in the softer footwall contain, as a rule, the higher grade silver-lead smelting ore. In the 1,350-ft south stope the ore extends into the limestone (sandrock), as it does on the 650-ft. level, and with equally promising results, as far as developments go at the present time. The results from crosscutting into the footwall, beyond the apparent influence of the main vein, have not proved of any intrinsic value. All of the workable ore-bodies met with in the limestone show a direct connection with the main ore-chutes. A cross-cut was run into the hanging country on the 1,250-ft. level, but nothing was found there.

"The chief work in the mine has been the installation on the 1,550-ft. level of a new compound duplex pump, built by Henry R. Worthington, of New York. It has 19½ in. and 33⅜ in. steam cylinders, 8½ in. plungers and a 2-ft. stroke. The engine is working in a satisfactory manner, and is pumping to the surface in one lift. The 10-in. water column and the 6-in. steam line have been extended to the 1,550-ft. level also. The tailings dam system and water ditch have been extended as circumstances required. The area being large the settlement is good, and the water is delivered clear to the creek. The wood contractors finished the construction of the tramway from the boiler rooms to the timber early in the year, and have been delivering fuel direct to the furnaces since last February. This arrangement saves us the extra handling of fuel in the yards. The steam for the mill engine and pans is now made at the hoist boilers, those at the mill having been closed down since last March. The results are satisfactory in every way."

The total development work for the year was: Drift, 1,759.9 ft.; raise, 781.5 ft.; cross-cut, 248.7 ft.; sinking main shaft, 140 ft.; a total of 2,930 ft. The average cost of drifting per foot was $5.059; raising, $5.660; crosscutting, $4 781; sinking main shaft, $22.778 per ft. These charges do not include any proportion of the surface or pumping charges. In connection with the development work, two pump stations, each 30 ft. by 11 ft. by 12 ft. in the clear, were cut at the 1,550 ft. level and the sump tanks put in.

The total amount of ore hoisted was 14,831 tons; add ore on hand, 129 tons, makes, 14,960 tons in all. Of the ore hoisted 10,242 tons came from the 1,250 ft., 1,350 ft. and 1,450 ft. levels. The ore was disposed of as follows: Dry ore to mill, 10,165 tons; sold to smelter, 3,193 tons; second class to dumps, 172 tons; waste sorted out, 1,430 tons; total, 14,960 tons. There is now on hand 3,698 tons of second class ore, of an average assay of 20 oz. per ton.

The mill was closed in January and July for the regular clean-ups and in November to rebuild the roaster. The batteries ran in all 321 days 4½ hours, and the pans 333 days 6 hours. The amount crushed was 1·47 tons per stamp per day. The work was done as follows: Wet tons crushed, 11,743; salt used, 1,639 tons; dry tons panned, 11,804; product, fine silver, 428,499·270 oz.; pure gold, 366·882 oz.; assay value of ore panned, 38·738 oz.; assay value of tailings, 3·593 oz.; proportion saved according to assay returns, 91·866%; according to bullion returns, 93·704%. The smelting ores sold were 3,193 tons, containing 349·63 oz. gold, 332,195·98 oz. silver and 548,382 lbs. lead; their net value was $186,650, an average of $58.45 per ton.

An analysis of costs of treatment per ton of ore in the mill, for the year 1893, is as follows:

Labor:		Supplies:	
Superintendence	$0.4998	Chemicals	$0.0548
Engineers	0.2174	Lubricants	0.0346
Crushermen	0.1774	Illuminants	0.0058
Dryermen	0.1799	Fittings	0.0064
Batterymen	0.2432	Tools	0.0029
Roastermen	0.2121	Castings	0.3843
Cooling floor men	0.1800	Iron and steel	0.0242
Carmen	0.3592	Lumber	0.0139
Amalgamators	0.2421	Charcoal	0.0381
Pan helpers	0.1913	Belting	0.0214
Assayer (proportion)	0.0677	Quicksilver	0.3990
Storekeeper	0.0619	Salt	1.7316
Millwright	0.0717	Fuel	1.1715
Mechanics and repairs	0.2089	Assay office	0.0338
Teams and labor	0.1333	Stables	0.0319
Watchman	0.0928	Office and incidentals	0.0724
Tailing storage	0.0919	Freight	0.1156
Office (proportion)	0.0762	Insurance	0.1658
		Machine shop	0.0033
Total labor	$3.3398	Legal expenses and taxes	0.3833
Add supplies	4.7822	Sundries	0.0876
Total mill cost	$8.1220	Total	$4.7822

The report says: "The costs of mining, including sinking of main shaft, development work and proportion of surface expenses, were $12.813 per ton; costs of milling, including proportionate charge of surface expenses, $8.122 per ton; making total costs, $20.935 per ton. The costs of mining have increased $1.185 per ton, and the costs of milling have decreased $0.556 per ton, making a total increase of costs over 1892 of $0.629 per ton. The estimated amount of ore in sight on December 31st, 1892, was 23,500 tons. At the present time the blocks of ground exposed show contents which, figured upon the same basis, will yield 22,500 tons, of an average assay value of 48 oz. of silver per ton. The mine and mill machinery is all in good order and condition. The supplies of fuel, mining timbers and salt are contracted for and delivered direct to the works."

Missouri River Surveys.—The United States Engineering Department has just completed a survey of the Missouri River as far down as Atchison, Kan. In the opinion of the engineers the Missouri River is dwindling away. They found that the volume of water at Great Falls, Mont., measured 4,796 cu. ft. per second, while at Fort Benton, 25 miles down the river, the volume was but 4,331 cu. ft. per second, a decrease of 465 cu. ft. This, they claim, explains the presence of the great subterranean body of water know as the South Dakota Artesian Basin. The discrepancy is accounted for by an outlet in the bed of the river somewhere between the points mentioned. The engineers state that eyeless fish have been discovered in the above locality, such as inhabit subterranean streams. In 1878 similar observations as to the volume of water were taken by the department, and since that time there has been a decrease of fully 20% in the volume of water in the river.

THE BREUER-SCHUMACHER FORGING PRESS.*

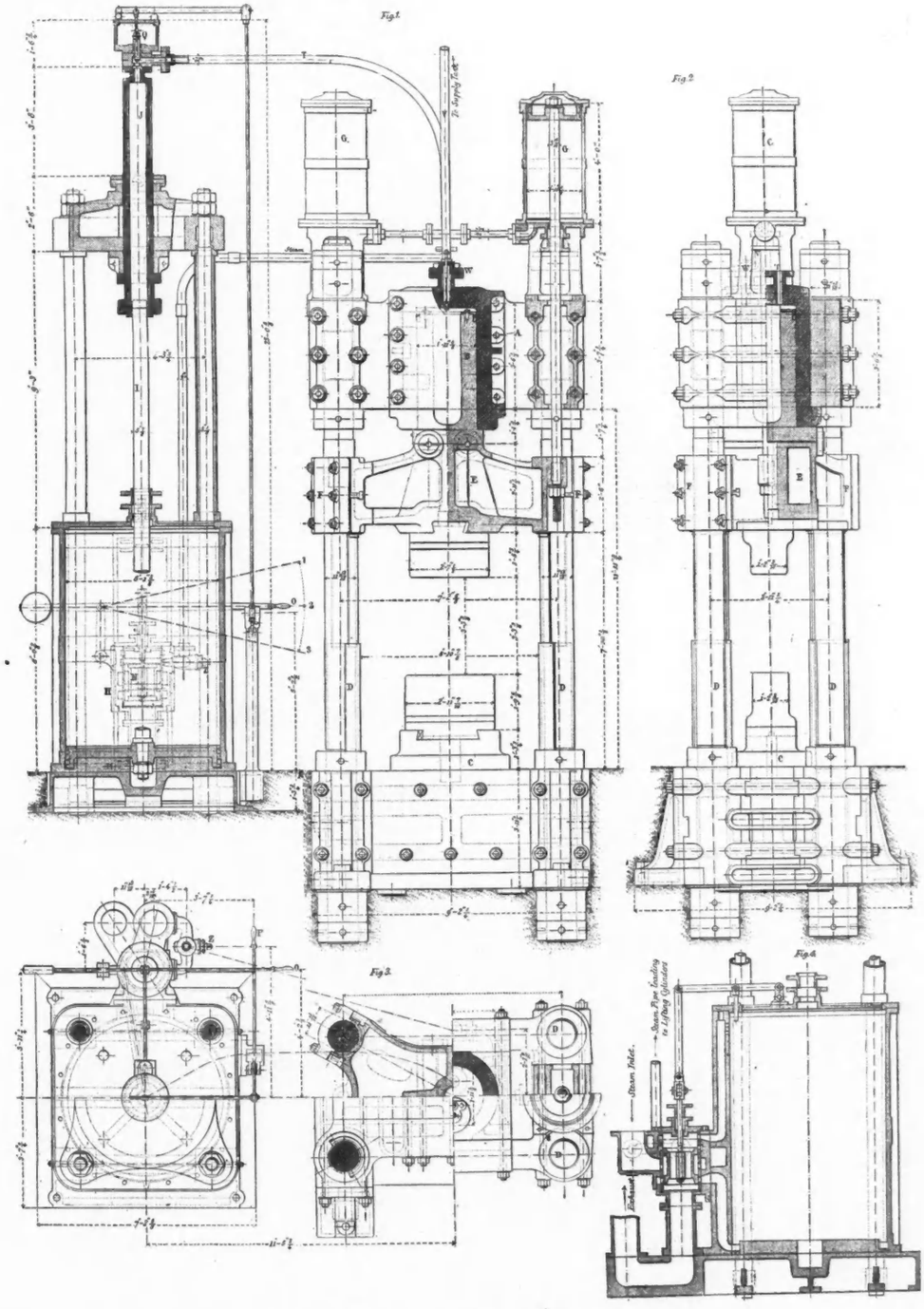
The use of the hydraulic forging press for much of the work formerly done by the steam hammer is rapidly extending. While the hammer cannot be superseded for many purposes, there is no doubt that for certain classes of work, such as working down ingots, and especially for die and stamp work, the hydraulic press has a most useful place.

The accompanying illustration shows a 1,200-ton forging press made by the Albion Works, Leeds, England, on the Breuer Schumacher system. The distinctive features of this forging press are embodied mainly in two parts:

1. The press proper, which embraces the main hydraulic cylinder, and also the small steam cylinders used for raising the moving crosshead or upper die-holder.

2. The steam driving apparatus, which also carries a small hydraulic cylinder.

The press proper, Fig. 1, consists of two crossheads. The lower one C carries the anvil block or bottom tools, and in the upper one A is mounted the main hydraulic cylinder B. These two crossheads are firmly connected by four forged columns D. The columns D act as guides for the moving crosshead E, as shown at F (Fig. 1), and also in plan on Fig. 2. This crosshead E carries the upper dies or forging tools, and is firmly connected to the ram B; therefore, when the hydraulic pressure is exerted on the ram, the moving crosshead is forced to descend.



THE BREUER-SCHUMACHER HYDRAULIC FORGING PRESS.

This crosshead, or upper die-holder E, is held in position by the rods of the two small pistons in cylinders G. These pistons are single-acting. Steam enters from below, and may be admitted or exhausted at will, thus allowing the upper die-holder E to be raised to any height suitable for the work under operation, and then to fall down again until it comes in contact with the ingot or work to be pressed. At this moment water is admitted to the hydraulic cylinder B.

The direct steam driving apparatus, Fig. 4, takes up little ground space, and may either be placed at the side of the press or outside the building

* Abstract from article in London "Engineering."

in which the press is erected. It consists of a vertical steam cylinder H, having the piston rod I, which acts also as the ram of the small hydraulic cylinder J. As in the case of the pistons G, the steam pressure is always exerted on the underside of the piston H, and the large cylinder is steam-jacketed, or covered with non-conducting material, to prevent condensation. The upper portion of this cylinder is also heated by the exhaust steam at every stroke of this piston. It is evident that if the small hydraulic cylinder J and the large hydraulic cylinder B (which are connected by the tube T without the intervention of any valves) are full of water, and the piston rod I, and consequently the large piston H, are at their lowest position, the introduction of steam under the large piston H will cause a flow of water toward B, and consequently a pressure will be exerted on the ingot or other article under operation.

To illustrate the principles of the working of this press, let us suppose that the upper die block of the press is in contact with an ingot, or a little above it. In this position, if J, T, and B are full of water, and the large piston H is at the bottom of its stroke, as is always the case at the commencement of the squeeze, it is only necessary to admit steam under the piston H, to force the water to lower the movable crosshead E, and consequently exert a pressure on the ingot. The mechanism for controlling the admission or escape of steam, under the large piston H, and also under the lifting pistons G, comprises a balanced slide valve N, which is controlled by the horizontal lever O. The large piston only comes into play at the moment of pressing, or a little before, otherwise there would be considerable waste of steam.

At the moment of pressure, the water, which must then exactly fill the cylinders and pipe J, T, B, cannot escape. Now the capacity of J and T, is constant, because at the moment of pressing the piston H, or rather I, is always at the bottom of its stroke. On the other hand, the piston B is more or less high, according to the section of the ingot under operation, and consequently the contents of the main hydraulic cylinder B cannot be constant. It is, therefore, necessary to vary the quantity of water contained in the cylinder and pipe J, T, and B, either by emptying, when the upper die-block has to be raised, or by filling, when it has to be lowered.

For this purpose another hydraulic distribution is required, and this is provided by the valve Q, actuated by the horizontal lever P. When this valve is open the water circulates freely from the outside tank R to the cylinders J and B, while, when it is closed, the volume of water which fills J, T, and B can no longer vary during the period of compression.

The lever P, as shown in Fig. 3, is crossed at right angles with the lever O, and below the latter. This arrangement permits the workman to manipulate either the two levers, or only one, as he desires. It has also this advantage, that when the lever O is brought back to its lowest position, it forces the lever P down to the position required to close the valve Q, and the volume of water contained in the cylinders J and B and pipe T cannot then escape, and in this position of the lever O steam is admitted under the large piston H.

It will, therefore, be seen that as soon as the upper die-block is brought into position by the introduction, or escape, of steam under the lifting pistons G, with the simultaneous filling, or emptying of the water in the cylinders J and B and pipe T, and corresponding stoppage of the piston H at the bottom of its stroke, the volume of water contained in J, T, and B becomes invariable by the closing of the valve Q. The piston H is then ready to ascend, in order to make the water flow in the direction of E, and consequently exert hydraulic pressure on the ingot under operation.

The press has a partial stroke, because the maximum hydraulic movement, or impression of the die-block E, is in proportion to the pistons H, I and B. This partial hydraulic stroke can be exerted at any point of the total traverse, which the crosshead E can make on columns D, and is calculated to be sufficient for all forging purposes. It is also variable, because the admission of steam under piston H can be stopped at will, thus reducing the hydraulic stroke of the upper die-holder, as may be desired.

The distribution is completed by a steam cock Z, with three ways entirely independent of each other, which serves to control the lifters G by means of the slide valve N, or to send the steam direct to the lifters by establishing open communication between them and the boiler.

In this system, unlike others, the distribution is not placed in the high-pressure mechanism, but in front of the steam cylinder. From this point of view alone this system has advantages over presses worked in the usual way by pumping engines and accumulators, which have numerous valves in the high-pressure mechanism, and a much greater system of hydraulic piping. These presses are regularly worked with a pressure of 2 to 3 tons per square inch. This system also avoids the safety arrangements for limiting the pressure, which are usual in other systems, because the maximum pressure for which the parts are calculated, cannot be exceeded. Another advantage of this system is the rapidity with which the presses can be worked. Fifteen to 20 impressions with hydraulic power can be given per minute with, say, a 700-ton press, and the moving crosshead E can be raised and allowed to fall at the rate of 30 to 40 strokes per minute, and this quick manipulation is very useful, especially when finishing certain kinds of work. The steam pressure at which these presses are usually worked is 60 lbs. to 80 lbs. per square inch, but they can be arranged to suit any pressure at disposal. Forging presses and hot-bloom shears for cutting the largest sections on this system are largely used in Europe, considerably over 100 being now at work: one press, used by Fred Krupp, at Essen, exerting a total pressure of 5,000 tons.

Land Sales in "Boom" Towns.—The Fort Payne Coal and Iron Company started in some time since to collect balances alleged to be due on certain lands bought of the company during the "boom." In a number of instances suits were brought. One of these cases reached a trial in the Superior Court at Lowell, Mass., last week, and resulted in a defeat for the company. The defence was made that the land was bought on condition that the company should successfully establish certain industries and to do other work of development. It was shown that this condition was not complied with, and beyond this, that there was much misrepresentation by the promoters of the enterprise at its very inception. The case was really a test one, and will probably bar the company or the people holding the claims from recovering in other cases, if it is confirmed on appeal.

THE NEW GOLD FIELDS OF THE MOSQUITO COAST OF NICARAGUA.

Written for the Engineering and Mining Journal by Courtenay De Kalb, E. M.

Within the last few years important discoveries of gold on the eastern slopes of the Nicaraguan Andes have created some excitement in Central America, and numbers of American prospectors have already entered the field. In spite of the many natural obstacles to work in a tropical wilderness, no less than 1,000 men are at present engaged in washing gold in the rivers or exploring quartz veins in the mountains. The output of the precious metals has been steadily increasing until it has exceeded 10,000 oz. within the current year.

The principal discoveries have been made on the head waters of the Principulca River, in the Matagalpa Mountains, a short distance west of the Mosquito Reservation. A wretched trail leads over the mountains from the city of Matagalpa to the Principulca mining district, but the difficulties of this route are so great that all communication is by way of the Principulca River to the Caribbean Sea. As a result of this the Mosquito Reservation takes the lion's share of the profits from these new gold fields. Indeed the merchants of the Mosquito Coast have practically tied up the majority of the producing claims by extending large credits to the miners, and in doing this have unduly anticipated the yield from the washings.

None of the placers are of large extent, but they are frequently very rich, so that in a few cases as much as 200 oz. of gold have been taken out with a California rocker in a single day. Several rich "pockets" have also been found, chief among which is "El Dorado," which produced $15,000 a few years ago, and then dwindled to a mere auriferous thread. Subsequent developments on this claim led to the discovery of a second "pocket" from which $10,000 were taken out during the past summer, and it is still producing considerable quantities of gold. A large placer of cemented gravel, upward of 40 ft. in thickness, said to average ½ oz. to the cubic yard, has recently been reported from the Rio Wany, a tributary of the Principulca, but this information rests upon the statements of prospectors.

The Principulca District, created by a law of Nicaragua about three years ago, embraces within its jurisdiction the headwaters of several rivers, among them the Wass-puk, a tributary of the Rio Wanks, which empties into the Caribbean Sea at Cape Gracias a Dios. The tributares of the Rio Wanks have frequently been examined in search of gold, and in the latter part of the seventeenth century considerable amounts of money were expended by French and English traders in fitting out expeditions to prospect these rivers. An account of these early efforts has been preserved in a work entitled "The Mosqueto Indian and His Golden River," written presumably by a former buccaneer, who signed himself "M. W." This manuscript, prepared in 1699, was published in London in 1746, and is included in Churchill's "Voyages." From his narrative it would appear that mica scales floating in the water of the Rio Wanks were mistaken for a mysterious sort of gold too "refractory" for treatment, but they believed that near the headwaters of the streams it would be found in a "heavier form." These fancies were encouraged by small amounts of actual gold brought by the natives from the interior. The Indians were so reticent regarding its origin that the statement of one petty chieftain to the effect that the gold washings were on a great southern tributary of the Wanks were discredited as a ruse to mislead the gold hunters, who turned their attention in consequence exclusively to the northern tributaries. Recent developments have proven, however, that the old chieftain told the truth. The most important gold mine so far developed in Nicaragua has been discovered on the Piz-piz River, which stream flows into the Wass-puk, the largest southern tributary of the Wanks. The Piz-piz drains a portion of what is called on the maps the Messa de los Toakas, which, however, is not a tableland but a group of mountains having an average elevation of about 1,000 ft. above the sea. In addition to this important mine of "Siempre Viva," several claims of less value have already been located in this region, which has been erected into a separate mining district, called "Piz-piz," under the jurisdiction at present of a "mining judge" stationed at Cuicuina on the Principulca River, 40 miles distant. One of these mines, "La Constancia," has been worked for more than a year, the ore being treated by native arrastra mounting two abrading stones of 800 lbs. each, actuated by water power. The value of the ore milled ranges from $10 to $8 a ton, which is less than that from Siempre Viva. It is intended to erect a modern stamp mill on the latter property within the next six months.

The geology of the region is very simple. Along the eastern flanks of the mountains occur carboniferous limestones, upon which lie uncomfortable red sandstones and variegated shades evidently belonging to the Permian period. Basaltic dykes have obtruded through these rocks at many places, and higher up all traces of the Permian formations are lost sight of, the mountain masses being composed entirely of rocks of the diorite group, largely porphyritic, and of metamorphosed shales. It is along the lines of contact between diorites and shales that the veins are found. Cross veins, and off-shoots are rare, but usually penetrate the diorite when they do occur. The country rocks being so highly basic, and the veins being siliceous, the effect of denudation has been to leave the veins exposed on the surface. Another result of the basic character of the country rocks is that their rapid weathering under the influences of a tropical climate produces a stiff clay, which overspreads the surface everywhere, and fills in the crevices of the rocks, so that water does not permeate to any extent, and workings do not require drainage except in the lowest depressions among the mountains.

The difficulties of transportation are very considerable, the present route to the mines being up the Principulca and Banbana rivers in canoes about 175 miles, and thence over ox roads through the mountains from 10 to 15 miles. The cost of delivering freight into

the Piz-piz district from the coast of the Caribbean Sea is now about $9 per 100 lbs., which could, however, be reduced to $5 by the building of ox roads 25 miles farther down the river to the head of navigation for large canoes. The use of steamboats of shallow draft would be possible to within 40 miles of the mining center.

Another mining region is now being prospected in the territory of the Mosquito Reservation on the Wawa River. The country here is low and flat, having an elevation of less than 100 ft. above the sea, so that drainage would probably prove an obstacle to exploiting mines even if the veins should be rich. Their only advantage is that of proximity to deep-water navigation. Numerous claims have been located, and one, the "Cocoa," has been worked to some extent with good results by American prospectors, the ore being crushed with a steam stamp improvised out of an old Ingersoll-Sargent drill.

The people of the Mosquito Coast are explorating these newly discovered gold fields, although as yet only one property has been found worth working on any considerable scale. The government of the Mosquito Coast as well as that of Nicaragua is liberal toward prospectors and investors from abroad, granting them equality of rights with those native to the country, and this has resulted in drawing thither large numbers of gold hunters.

THE COAL MEASURES OF IOWA.*

By Dr. Charles R. Keyes, Assistant State Geologist.

(*Continued from page* 270.)

West of the section shown in Fig. 3 the St. Louis limestone disappears below the level of the water in the Des Moines River. It appears again at Elk Cliff in a low anticline exposed for a few hundred yards. At sand-bed had been raised above the surface of the waters, consolidated, and then subjected to considerable denundation. In a small gorge or ravine, excavated in the sandstone, the carbonaceous material was deposited as the land was again being submerged. The inference is, then, that the abrupt disappearance of the great bed of sandstone in such a short distance as half a mile above the quarry where it has an exposure of more than 100 ft., is not due wholly to the inclination of the stratum, but it is the result of great erosion in that direction, previous to the deposition of the shales and clays; and that the massive sandstone really formed a bare hill of considerable height against which the subsequent deposits were laid, when the conditions favorable to such a change occurred.

Here, to all appearances, is an extensive sandstone formation with a maximum thickness of more than 150 ft., lying unconformably upon the Saint Louis limestone, and with coal-bearing strata imposed unconformably upon it. At one time it was thought the sandy member represented shore or estuary deposits of the Kaskaskia sea. Such, however, was found not to be the case. A few miles below Elk Cliff, as already remarked, exposures were observed showing fully 75 ft. of dark, sandy, clayey and bituminous shales between the sandstone and the concretionary limestone. The shales carry at least two workable seams of good coal, one of which attains a thickness of 5 to 7 ft., and has a very considerable geographical extent.

The recent observations, therefore, have cleared up many of the hitherto doubtful points concerning the geological history of the Redrock sandstone. It is not the basal member of the coal measures, nor is it a shore extension of the Kaskaskia limestone; neither is its geographical extent as limited as has been supposed. Twenty miles to the southeast of Redrock a sandstone of great thickness, having identical lithological characters and with a similar stratigraphical position, is believed to be its extension southward. It may also rise a few feet above low-water in the

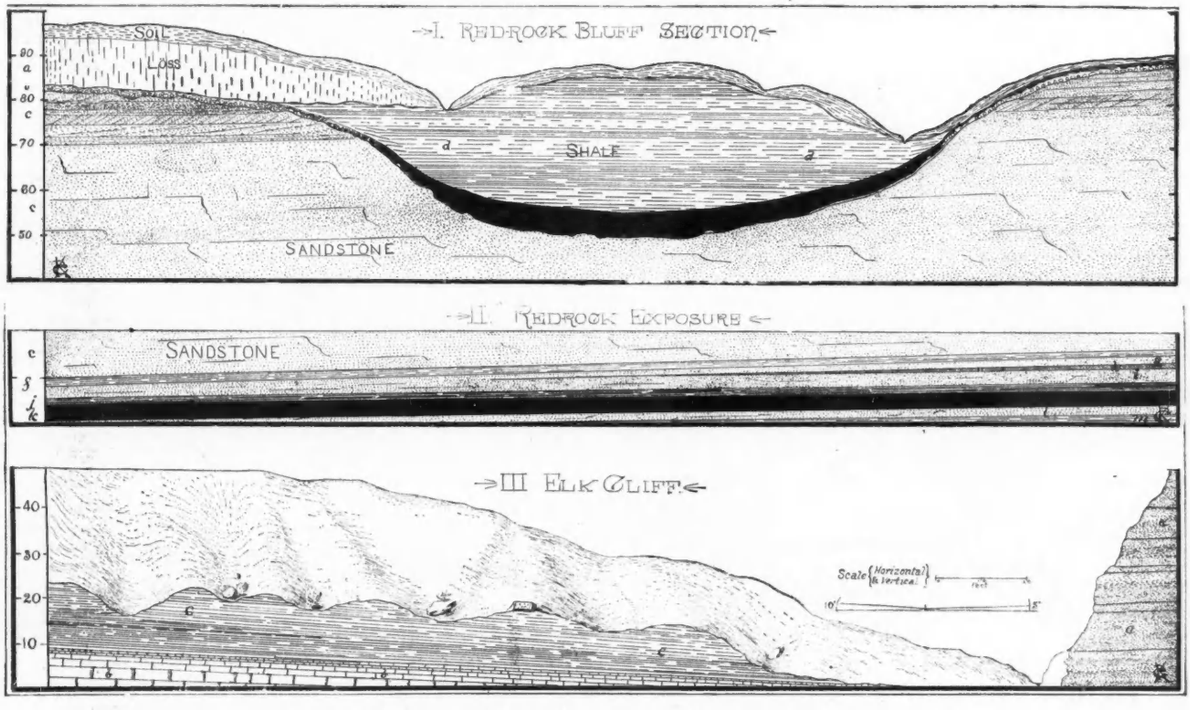


FIG. 4.—UPPER AND LOWER LIMITS OF THE REDROCK SANDSTONE.

various places this limestone shows its upper surface channeled and unevenly eroded, the soft white clays favoring the superior member of the formation being completely removed. Coal measure clays or sand fill these ancient ravines. In the 10 miles between Harney and Elk Cliff, where careful measurements have been taken, it is shown that not less than 75 ft. of shales intervene between the two horizons of the lower coal measure sediments in contact with the St. Louis limestones.

In Fig. 4 there are shown three exposures illustrating these formations. No. 1 is a section of the Redrock Bluff; No. 2 shows the Redrock exposure, and No. 3 the stratum as exposed at Elk Cliff. The Redrock sandstone rises in vertical cliffs to the height of 150 ft., and the strata are visible to the water's edge. The direct line of contact between the arenaceous and calcareous bed is covered by the detritus brought down by the river. At Elk Cliff a fine-grained ferruginous conglomerate takes the place of the sandstone; mile beyond the latter has disappeared, and the section shows only sales and clays. At the Redrock quarry (No. 1) the upper limit of the sandstone is very uneven and paved with boulders and pebbles from the sand stone itself. A fire-clay covers this pavement; and upon it rests a coal-bed having a thickness of 6 ft. centrally, but rapidly thinning out laterally in both directions to a very unimportant, scarcely recognizable, bituminous seam. Northward, or at right angles to the face of the section, the coal is thicker. Superimposed upon the coal are drab and ash-colored clayey shales, having an exposed thickness of 30 ft., but they are manifestly much more extensive. From a consideration of this section, then, it is clear that before the superimposed coal seam was formed the vast northwest corner of Marion County. The most interesting consideration in regard to the Redrock sandstone is the fact of its considerable elevation above the surface of the sea and its subjugation to sub ærial erosive agencies for a long period of time before submergence again took place. During the interval the great thickness of sandstone probably was almost entirely removed in places.

A short distance above the Redrock cliff the great sandstone disappears completely, not on account of rapid dips or faulting, but through erosion.

A section taken at Bennington is shown in Fig. 5. The succession of beds is as follows: 7. Drift with stratified layers of gravel and sand, containing numerous boulders, 40 ft. 6. Shaley sandstone containing much clay, 10 ft. 5. Buff sandstone, somewhat shaley in places, 15 ft. 4. Soft, blue sandstone, 4 ft. 3. Buff sandstone, heavily bedded, 4 ft. 2. Coal, 2 ft. 1. Massive sandstone, rather compact (exposed), 10 ft. From Bennington to Des Moines the strata are greatly undulatory: west of Des Moines they are nearly horizontal.

The geological cross-section of the Carboniferous in central Iowa, as described in detail in the foregoing pages, may be taken as representative of the lower coal measures of the State. A summary of facts brought out may be graphically given in a generalized, or rather composite, section, as shown in Fig. 6. Briefly stated, these facts may be enumerated as follows:

1. The Coal Measures of Iowa were laid down over an ancient surface with hills and vales, ridges and gorges. The line of overlay passing over Lower Carboniferous, Devonian, and even Silurian rocks.

2. The unconformity of the Lower Coal Measures of Iowa upon limestones of the Lower Carboniferous is much more pronounced than heretofore suspected. The confirmation of this statement is found in excava-

* Abstract from Report of the Iowa Geological Survey. For the illustrations we are indebted to the courtesy of the Survey.

tions recently made at Elk Cliff, at Harvey, at Fairfield, in Jefferson County, and elsewhere.

3. The striking unconformities in the Lower Coal Measures have never been so apparent as at present. The most remarkable instance of this sort is the case of the Redrock sandstone. The thick sand-bed had been manifestly consolidated, and elevated above the surface of the sea for a considerable distance; then it was subjected to long denundation, as is shown in the deep gorges and ravines which are still preserved in the hard sandstone. So wide-spread was the action of the erosive agencies that the great sandstone, more than 150 ft. in thickness, was largely removed; and at the present day only a few isolated outliers tell of its former great extent. When regional submergence again set in, the old gorges and shore depressions were occupied by small swamps.

4. The earliest formed coal seams are far more extensive, both geographically and vertically, than the later ones. On the whole, the coal of Iowa may be regarded as distributed in innumerable lenticular basins, sometimes several miles in diameter and 6 or 7 ft. in thickness centrally, sometimes only a few hundred yards in extent. These occur at many different horizons and interlock with one another, so that a boring may pass through a score or more coal horizons without meeting more than one or two veins of sufficient thickness for profitable working.

One of the most striking characteristics of the coal formations in Iowa is the great variability of the beds, as shown in many places.

In Iowa, at least, it appears that the extension of the coal measures beyond the boundaries of the Saint Louis limestone was much more than an overlap in the ordinary sense of the word, such as might have taken place off shore in gradually deepening waters. It was a sinking of an ancient land surface that had been more or less profoundly carved into hills and valleys, affording protected nooks favorable to swamp formation and the rapid accumulation of vegetable materials.

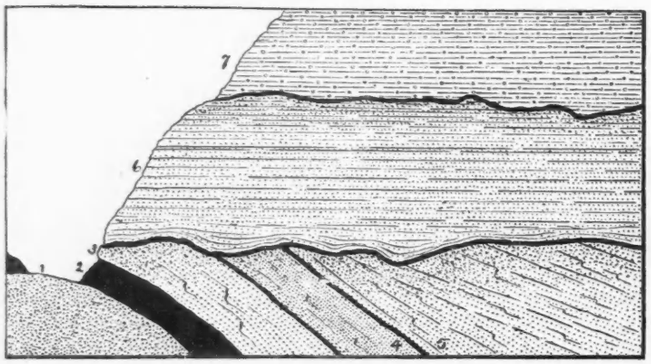


FIG. 5.—SECTION NEAR BENNINGTON, IOWA.

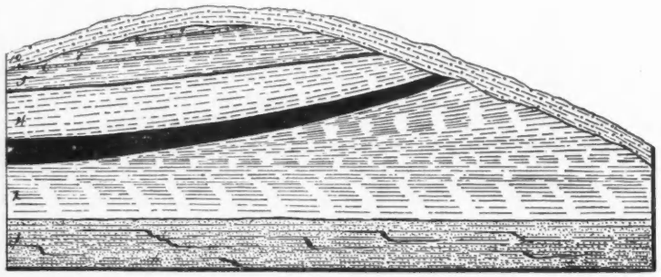


FIG. 7.—SECTION AT TERRACE HILL, IOWA.

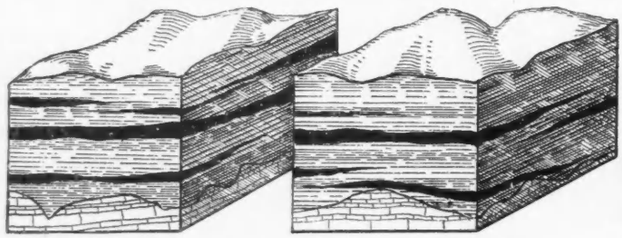


FIG. 8.—STRATIGRAPHICAL ARRANGEMENT OF COAL BEDS.

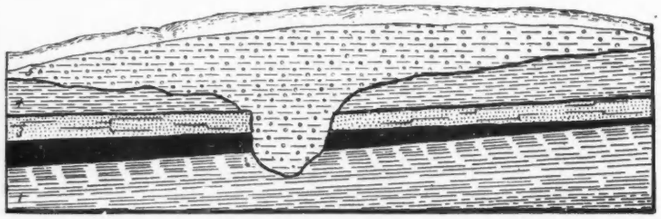


FIG. 9.—PRE-GLACIAL CHANNEL IN COAL BED.

In mining operations, especially east of the Des Moines River, the importance of these facts, concerning both the disposition of the coal-beds toward the base of the series and the true nature of the bottom of the coal measures, can hardly be overestimated. Instead of a perfectly flat plane as commonly supposed, the surface upon which the coal deposits were laid down was topographically not very unlike the present surface features, though of course there is no coincidence of hills and valleys, for an ancient elevation often is exposed in one of the modern river beds.

Local unconformities in the Iowa coal measures are well shown in a number of places. The one noticed in connection with the Redrock sandstone, already described in the geological cross section of the coal measures in central Iowa, is perhaps the most prominent now known. It is fully 200 ft. above the lower carboniferous limestone. Sections show an entire thickness of more than 100 ft. of the Redrock sandstone to be removed through erosion. In other places coal-beds fill the old gorges. Other physical breaks in the coal measures are indicated elsewhere along the same stream but at present they are more or less completely obscured by débris. These phenomena go to show that during the deposition of the coal-bearing strata numerous minor oscillations of the shore line occurred, allowing the waters to recede slightly and then again advance inland.

In connection with the leading geological features of central Iowa as brought out by an examination of some of the natural exposures, allusion should be made to the information pertaining to the Carboniferous rocks below the datum line of the general section. While the notes already taken are quite voluminous, they are not at present in shape suitable for presentation. All attempts to secure reliable accounts of the strata passed through in the borings and sinking of mine shafts have availed but little, since such information is almost invariably withheld by the parties in charge of the operations. For this reason the difficulties of working out the structural details of this part of the Carboniferous series were somewhat greater than they otherwise would have been; and the final results are thus considerably delayed.

As already stated the general dip of the strata along the present line of investigation is southwestward. The mean thickness of the lower coal measures, as shown by careful measurement of the various members, must originally have been considerably more than 700 ft. This determination was arrived at in the following way: At the most easterly exposure of the section, the distance from the St. Louis limestone to an easily recognizable bed near the top of the bluff was perhaps 50 ft. in a direction normal to the dip. This particular layer was then traced to the point where it disappeared below the datum line, and the measurement was repeated in the same manner as before. Of course it is not to be supposed that the present thickness of the lower coal measures in central Iowa is nearly so great as the figures above given would suggest; for in reality the maximum vertical measurement of the beds is probably a little over one-half this estimate, or not far from 400 ft., as is actually attested by borings. Erosion has largely removed the coal-bearing strata of the district, and therefore the original thickness of these rocks is not preserved in any one place.

There is an opinion prevalent among the miners of the district that there are only three workable coal horizons. These are usually designated as the "first," "second" and "third" seams. Should any subordinate seams be encountered in the sinking of a shaft, they are not taken into consideration. As a matter of fact the "three" veins are not continuous over areas of any great extent, and may have widely different stratigraphical values even within very short distances; the "first," "second" and "third" veins of one shaft being entirely distinct from the similarly called seams of another mine scarcely half a mile away. A noteworthy instance for citation in this connection is a boring made near the city of Des Moines. It was 200 ft. in depth. Twelve distinct coal horizons were met with, giving a total thickness of coal of 13¼ ft., yet none of the beds was thick enough for profitable working. Only one-third of a mile away was a mine removing coal from two seams, one of which was from 4 to 5 ft. in thickness.

The stratigraphical importance of the coal seams is not so great as has been generally supposed, since the bituminous beds are, with very few exceptions, quite limited. Only a single case is known at present in which the geographic extent of a coal stratum is more than four or five miles, and for the greater part of this distance the coal is but a few inches in thickness. It follows that the coal seams of the region are not nearly so extensive as commonly regarded, and that they possess little value in general correlations.

The basal coal seams in the lower coal measures of Iowa appear to be much more extensive than those toward the top, where they may be only a few inches in vertical measurement and perhaps a hundred yards in extent—too small for representation in the general section. The coal may, therefore, be regarded as disposed in numerous basins of greater or less area, thickened centrally, but gradually becoming attenuated toward the margins, as shown in Fig. 7, at Terrace Hill, Des Moines. These are arranged in various horizons, interlocking with one another, but separated by varying thicknesses of sandstone and shale. Thus, at any one point a dozen or more seams may be passed through in sinking a shaft, only two or three perhaps being workable. This arrangement is seen in the Des Moines River section of the lower coal measures. It may be more clearly represented by Fig. 8.

The disposition of the coal in numerous, limited, lenticular basins instead of a few layers extending over broad areas is of the utmost importance from a purely economical standpoint. In all mining operations and in all prospecting it is very essential that this fact be kept constantly in mind. With methods of boring more modern than those commonly in vogue throughout the Western States, there is every reason to believe that, in the lower coal measures especially, the large majority of good coal veins 12 in. in thickness and over encountered in prospecting can be traced readily and easily to localities where they are thick enough for profitable working.

In Iowa the restrictions upon the distribution of the individual seams are not numerous as compared with those of other regions. Yet there are disturbances of various kinds which break the continuity of the coal strata, locally interfering seriously with mining operations. They are referable to the three general agencies of deposition, erosion and dislocation. The irregularities of deposition are due to unevenness of the floor and to the pressure of varying currents at the time the beds were laid down. The effects of inequalities of the bottom are to terminate the coal layers abruptly; to cause a rapid thinning and disappearance of the bed; to subdivide a coal basin, or on the other hand to cause a local increase in the thickness of the coal. The most serious interference with the continuity of the coal beds arises from erosion, the effects of which in later geological or post-glacial times are easily inferred from the present topography of the region, and cause little trouble in mining operations. The work of preglacial degradation cannot be read from existing topographical features. Some of the most familiar phenomena of this kind met with in mines are old channels filled with sandstone or shales that cut off abruptly even the thickest coal veins. Fig. 9 shows a section in the Polk County coal mine in which an old gorge is buried by glacial débris. Elsewhere these ancient waterways are filled with arenaceous material. So far as known, regular faults are of little consequence in the Iowa coal measures, though small local slippings are often encountered.

(To be concluded.)

THE PRINCIPAL SMELTING REACTIONS OF BLAST FURNACE SLAG, CONSIDERED ON THERMO-CHEMICAL PRINCIPLES.

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

The formation of blast furnace slag, the by-product of pig iron, begins after the charges have descended to the furnace zone in which the carbonate of lime changes to free lime, when partially reduced oxide of iron and portions of the lime unite with silica and with silicates by fritting or incipient fusion. Descending through the zone of carburization, the fritting ingredients contract gradually to sintered or semi-vitrified masses, which even carbonic oxide gas (CO) cannot easily penetrate. In these impervious masses considerable portions of partially reduced oxide of iron remain inclosed until the impervious shell or covering melts off; hence the iron ore does not become completely reduced until it arrives in the zone of fusion.

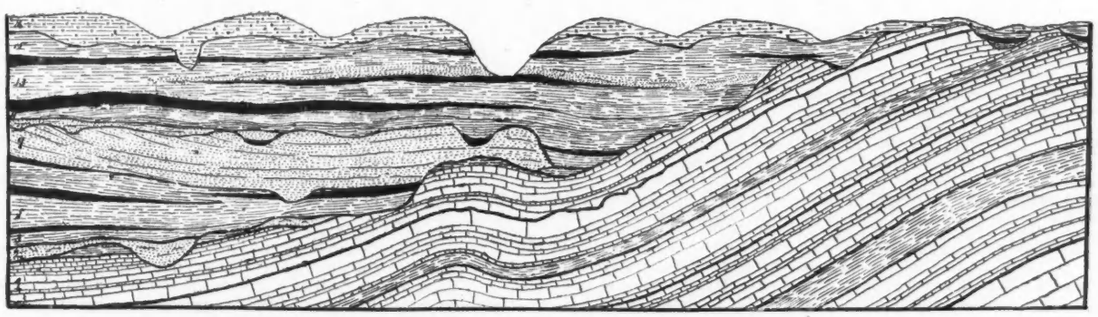


FIG. 6.—SECTION SHOWING STRUCTURE OF LOWER COAL MEASURES IN IOWA.

Further down in the zone of carburization, the descending charges come in contact with the sulphurous gases that arise from the zone of fusion and from the zone of combustion. As these gases (chiefly SO_2) become reduced, sulphides form; the greater portion of the regenerated sulphur combining either with metallic iron or with lime. The lime reaction may be supposed to be the same as when sulphur and lime are heated under exclusion of air in a crucible, viz., $4CaO + 4S = 3CaS + CaSO_4$. When the temperature of the reducing gases is sufficiently high, a part of the regenerated sulphur is apt to combine with glowing carbon to carbon disulphide, which can also react on the lime ($2CaO + CS_2 = 2CaS + CO_2$). Both lime reactions require, however a higher temperature than the formation of ferrous sulphide does ($Fe + S = FeS$). Hence the formation of sulphide of lime rises with the temperature of the zone of carburization, whereas the formation of ferrous sulphide increases when that temperature is not high enough for the formation of sulphide of lime (Ca[Mg]S). Later on, still uncombined portions of the lime unite with the ash of the coal or coke, which consists chiefly of aluminous silicates intermixed with spent pyrites. The latter, at the temperature then obtaining, give off more sulphur and pass into the hearth as ferrous sulphide, excepting such minor portions as may become decomposed by coming in contact with sulphates. After collecting in the hearth, the sulphide of lime remains with the slag, whereas the ferrous sulphide —on account of its higher specific gravity—goes into the metal. When the metal is highly carbonated and highly superheated, then the ferrous sulphide is apt to become decomposed by the carbon of the metal ($Fe_4C + 2[FeS] = 6Fe + CS_2$), and the resulting carbon disulphide is apt to become oxidized in passing upward through the zone of combustion, thus furnishing additional supplies of SO_2 for the regeneration of sulphur vapors in the zone of carburization.

During the molecular rearrangements that take place in the collected slag, the sulphides of low specific gravity are apt to insert themselves between the aggregates or multiples of the silicate-molecules in such manner that proportionate aggregates of silicate-molecules are joined or held together by proportionate aggregates of the sulphide-molecules. Assuming, for instance, that the rearranged silicate-molecules are of the composition: $12(Ca, Mg)O, Al_2O_3, 7\frac{1}{2}SiO_2$, and that they carry three per cent. of sulphide of lime, then the latter obtains, approximately, in the proportion of one molecule of (Ca[Mg]S) to two molecules of $12(Ca, Mg)O, Al_2O_3, 7\frac{1}{2}SiO_2$. As the sulphides are not active factors in the process of assimilation, which the continuously collecting silicate masses undergo, they can only hamper and retard its progress; hence the combining or fluxing energy of sulphurous slag is also much inferior to that which silicate masses of the same composition have when they are free from sulphides.

The flushed or tapped slag is apt to contain more or less of accidental ingredients that had not time to separate from it, such as ferrous sulphide, ferrous sulphate and agglutinated particles, consisting chiefly of unreduced or partially reduced ore intermixed with carbonated metal. When the hardened slag is remelted in a cupola furnace, the greater portion of this accidental ferruginous matter is apt to combine with the silicate masses.

Returning to the reactions that lead to the ultimate combination of the fritting ingredients of the descending charges, their progress can be explained as follows, beginning with the formation of simple silicates by the direct union of their constituent oxides: Nearly all of these oxides are, practically, infusible. The specific heat of those that has been determined is, approximately, in inverse proportion to their molecular or atomic weight. Their absolute fusibility may be assumed to be in inverse proportion—and their absolute melting point, consequently, in direct proportion—to their specific heat. Their actual melting behavior depends, however, to some extent, on the state of their molecular condensation Magnesium oxide, for instance, is more fusible than calcium oxide, though its specific heat is considerably higher than that of calcium oxide can be assumed to be. These deviations from the general rule have, however, no practical bearing on the igneous reactions of the respective substances, inasmuch as calcium oxide frits, with silica, at a lower temperature than magnesium oxide does, and their contingent melting point may, therefore, be assumed as approximately proportionate to their specific heat.

Adopting the latter conclusion as a general rule, the comparative or contingent fusibility of the more important constituents may be assumed to stand in the following order, beginning with the oxide having the lowest specific heat, and consequently the lowest melting point:

$(FeO), MnO, Fe_3O_4, Fe_2O_3, SiO_2, CaO, Al_2O_3, MgO.$

As FeO does not obtain in the free state, its specific heat as well as its contingent fusibility have to be inferred from those of Fe_3O_4. According to general rules Fe_2O_3 must be more fusible than Fe_3O_4, and FeO more fusible than MnO. That the melting point of rhodonite (MnO, SiO_2) is considerably lower than that of fayalite ($2FeOSiO_2$) can only be due to the greater condensation of the ferrous silicate-molecules, inasmuch as the condensation of like molecules ($2FeOSiO_2 + 2FeOSiO_2$) involves the absorption of heat, and consequently a proportionate increase in the molecular heat, and a corresponding diminution in the fusibility of the condensed compound.

The primary fritting reactions may be defined as "the chemical combination, of molecules of two unlike substances, at a temperature that is below the melting point of either substance." As their mass becomes heated the respective substances accumulate energy according to their specific heat, the one having the higher specific heat accumulating, proportionately, more of it than the other. The excess of the energy that accumulates in the particles of the substance having the higher specific heat is proportionate to the difference in the molecular heat of the two, and can be transmitted by contact. When this transmission takes place, then the contacting molecules of the respective particles melt, and, as the melted molecules combine, energy is set free by the evolution of heat. Molecules of silicic oxide and molecules of a basic oxide unite thus, on the contacting surfaces of the respective particles, and in definite proportions, to primary silicate-molecules. As already stated, the amount of the energy that is set free by their union must be proportionate to the difference in their molecular heat, but it must also be larger than the amount of the excess that accumulated in the substance having the greater specific heat of the two, inasmuch as they combine at a temperature that is below the melting point of either of them. Hence, the specific heat of a primary silicate-molecule must be lower than that of either of its constituent oxides.

But the melting point of the most easily fusible simple silicates, of the alkalies, oxide of lead, etc., is higher than that of the respective basic oxides, whereas the melting point of a natural simple silicate of lime (Wollastonite) is considerably lower than that of its base, which is practically infusible. This seeming inconsistency can only be accounted for by assuming that the melted molecules unite, primarily, in the proportions of an equal oxygen ratio ($2CaO + SiO_2$, $2Al_2O_3 + 3SiO_2$, etc.), inasmuch as the total amount of the energy that is set free, when the respective molecules combine in the proportion of 2 : 1 or 2 : 3, is greater than that which could be set free if they combined in equal numbers. Moreover, if they combined in the latter proportion, $CaO + 2SiO_2$ would be more fusible than $CaO + SiO_2$, inasmuch as the specific heat of SiO_2 is lower than that of CaO; and if the specific heat of CaO were lower than that of SiO_2, then $2CaO + SiO_2$ would be more fusible than $CaO + SiO_2$, which

is not in accordance with the well-known melting behavior of mixtures having their constituents in the respective proportions.

If, on the other hand, it is assumed that the primary silicate molecules are singulo-silicate-molecules ($2CaOSiO_2$, etc.), then the thermal properties of all silicates, whether artificial or natural, can be accounted for in conformity with thermo-chemical rules. According to these rules, the secondary reactions of the combining oxides must then progress in the following order:

As the fritting temperature rises, the primary silicate-molecules that have formed at the initial temperature recombine, at first, with molecules of the oxide having the lower specific heat of the respective constituents, and, in thus recombining, energy is again set free under evolution of heat. The amount of energy that is thus liberated decreases as the measure of the absorption increases ($2CaOSiO_2 + SiO_2$....); and when it falls short of the amount that is required for the molecular work of recombination, then no further reactions can take place at the temperature obtaining, inasmuch as additional energy can only be accumulated with advancing temperature.

As the fritting heat becomes more intense, the more refractory of the basic oxides unite, with silica, to primary silicate-molecules, whereas the primary silicate-molecules that have formed at the lower temperature begin to take up molecules of the basic oxides, the specific heat of which is higher than that of the silica; and the simple silicate-molecules combine then to compound silicate molecules, viz.:

(1.) $2CaOSiO_2 + 2MgOSiO_2 = 2(2[Ca, Mg]OSiO_2)$.

(2.) $2CaOSiO_2 + SiO_2 = 2(CaOSiO_2)$, $CaOSiO_2 + MgO = \frac{1}{2}(2CaOSiO_2) + \frac{1}{2}(2MgOSiO_2)$, $2(Ca, Mg)OSiO_2 + SiO_2 = 2(Ca, Mg)OSiO_2$, etc.

The latter mode of combination must also be that by which the aluminous silicates of the ore and coal unite with basic oxides, viz.: $Al_2O_3 2SiO_2$ ($Si_2Al_2O_7$) + $CaO = CaOAl_2O_3 2SiO_2 = \frac{1}{2}(2CaOSiO_2) + \frac{1}{2}(2Al_2O_3 3SiO_2)$.

From the melting behavior of natural silicates that have the same constituents as blast-furnace slag, it may be inferred:

1. That the specific heat of simple silicates is, approximately, proportionate to the specific heat of their constituent oxides.

2. That the specific heat of compound silicates is, approximately, proportionate to the specific heat of their constituent simple silicates.

Applying these deductions to the melting reactions of the fritting ingredients, the following conclusions are arrived at:

1. As the specific heat of CaO is higher than that of SiO_2, the melting down of a charge, having the respective constituents in singulo-silicate proportions, requires a higher temperature than the fusion of a corresponding bisilicate composition.

2. A charge that is high in alumina melts more rapidly than a charge that is low in alumina, because the specific heat of compound silicates of lime and alumina is lower than that of simple silicates of lime (CaO) of corresponding constitution.

3. As the specific heat of magnesium oxide is higher than that of alumina, the compound silicates of calcia and magnesia do not melt as readily as the compound silicates of calcia and alumina.

From the melting behavior of hardened slag, and from that of other compounds that consist of amorphous mixtures of silicates, such as glass, it must, however, be inferred that the specific heat of such mixtures is, again, approximately proportionate to the specific heat of their constituent oxides. In other words, the molecular heat of the simple silicate-molecules is lower than the sum of the molecular heat of their constituent oxides, and the molecular heat of the compound silicate-molecules is lower than the sum of the molecular heat of their constituent simple silicates; but the molecular rearrangements that take place when unlike compound silicate-molecules unite, absorb just as much energy as was set free by their formation.

Hence, though compound silicates of lime and alumina melt more readily than simple silicates of lime, the formation of a homogeneous slag requires a higher temperature when the contents of alumina are high than when they are low, inasmuch as the specific heat of Al_2O_3 is higher than that of CaO.

It further follows that not all unlike silicates can combine with each other. Thus the reaction $2CaOSiO_2 + Al_2O_3 2SiO_2 (= Si_2Al_2O_7) = 2CaO, Al_2O_3, 3SiO_2 = 2CaO1\frac{1}{2}SiO_2 + Al_2O_3 1\frac{1}{2}SiO_2$ cannot take place, because the amount of energy that would be required for the endothermal—or heat-absorbing—reaction, $Al_2O_3 2SiO_2 - \frac{1}{2}SiO_2$, is greater than that which can be set free by the collateral exothermal—or heat-evolving—reaction: $2CaOSiO_2 + \frac{1}{2}SiO_2$.

On the other hand, an easily fusible silicate, for instance: K_2OSiO_2, can readily combine with silicate of alumina of the above constitution, because the formation of the double silicate of alumina and potassa sets free more energy than is required for the decomposition of the simple silicate of alumina.

The fusibility of the following substances (quoted after Von Kobell's scale) serves for the better illustration of the various melting reactions:

	Composition.	Probable Constitution.	Fusibility.
Minium	Pb_3O_4	$PbOPb_2O_3$	= 1
Borax	$Na_2B_4O_7$ + aqu	$Na_2O2B_2O_3$	= 2
Rhodonite	(Mn, Fe, Ca)O, SiO_2	O ratio 1 : 1 to 1½ : 1	= 2½
Anorthite	CaO, Al_2O_3, $2SiO_2$	$\frac{1}{2}(2Al_2O_3 3SiO_2) + \frac{1}{2}(2CaOSiO_2)$	= 3
Garnet	$3CaO, Al_2O_3, 3SiO_2$	$\frac{1}{2}(2Al_2O_3 3SiO_2) + 1\frac{1}{2}(2CaOSiO_2)$	= 3
Meionite	$6CaO, 4Al_2O_3, 9SiO_2$	$2(2Al_2O_3 3SiO_2) + 3(2CaOSiO_2)$	= 3
Wollastonite	CaO, SiO_2	$CaOSiO_2$	= 4
Tremolite	(Ca, Mg)O, SiO_2	$\frac{1}{2}(CaOSiO_2) + \frac{1}{2}(MgOSiO_2)$	= 4
Nephrite	(CaMgFe)O, SiO_2	$CaOSiO_2 + MgO\ SiO_2 + FeOSiO_2$	= 5
Enstatite	MgO, SiO_2	$MgOSiO_2$	= 6
Magnetite	Fe_3O_4	$FeOFe_2O_3$	= 6
Fayalite	2FeO, SiO_2	$2FeOSiO_2$	= 6>
Ferric Oxide	Fe_2O_3	Fe_2O_3	= Infusible

As the fritted masses melt and trickle down into the hearth, intimately intermixed with carbonated metal, their ferruginous constituents become gradually reduced, and the reduction continues after they have collected in the hearth, because carbonated metal passes continually through the collected silicate masses.

The progress of the respective reactions may be illustrated as follows:

$\left.\begin{array}{l} 2Fe_2O_3 3SiO_2 + 4CO = 2(2FeOSiO_2) + Si + 4CO_2. \\ 2FeOSiO_2 + 4CO = Fe_2Si + 4CO_2. \end{array}\right\}$

$\left.\begin{array}{l} 2Fe_2O_3 3SiO_2 + 2Fe_4C = 2(2FeOSiO_2) + 6Fe + Fe_2Si + 2CO_2. \\ 2FeOSiO_2 + 2Fe_4C = 8Fe + Fe_2Si + 2CO_2. \end{array}\right\}$

The amount of energy that is absorbed by the reduction of the silicates of iron—as above indicated—is considerably larger than that which is set free by the formation of the resulting silicides of iron (which go, of course, into the metal, where they are apt to become reoxidized by particles of unreduced ore unless the metal is high in carbon). The complete reduction of the ferruginous constituents of the slag is, therefore, only possible when the temperature of the hearth is very high and when the metal is highly carbonated. But when the furnace is working well, then the temperature of the furnace is also proportionate to the fusibility of the charges. Hence the reduction of the ferruginous constituents is, practically, proportionate to the specific heat of the collected silicate masses.

The charges that are fluxed with dolomitic limestone are, usually, lower in alumina than the charges that are fluxed with calcite ($CaCO_3$); and the specific heat of the magnesian slag that is low in alumina is higher than that of the calcareous slag that is high in alumina. Hence the ferruginous constituents of the composition: 12([Fe], Ca, Mg)O, $Al(Fe)_2O_3$, $7\frac{1}{2}SiO_2$, become more completely reduced than those of: $9Ca(Fe)O$, $2Al(Fe)_2O_3$, $7\frac{1}{2}SiO_2$; and they become also more completely reduced than those of: 9([Fe], Ca, Mg)O, $2Al(Fe)_2O_3$, $7\frac{1}{2}SiO_2$, because the specific heat of the composition is lowered when Al_2O_3 takes the place of 3(Ca, Mg)O.

The specific heat is also lowered by an increase in the proportion of the silica; hence—as regards ultimate results—it may be said that the contents of the ferruginous constituents increase in a measure with the acidity of the slag; and for slag of the same silicate constitution: 1, that in calcareous slag the proportion of their contents is approximately in inverse proportion to the contents of alumina; 2, that in magnesian slag the proportion of their contents rises in a measure with the proportion of the alumina.

The writer has found that blast furnace slag of the magnesian type is practically free from combined iron (in contradistinction to the mechanical admixtures heretofore mentioned) when it is approximately of singulo-silicate constitution, and when the contents of alumina do not exceed the proportion indicated by the molecular formula: 12(Ca, Mg) O, Al_2O_3, $7\frac{1}{2}SiO_2$, the relative proportions of CaO, MgO, being: 6–7CaO, 5–6MgO. As the reduction of manganous silicate requires a higher temperature than the reduction of ferrous silicate, it may also be said that the reduction of the ferruginous constituents increases in a measure with the contents of manganous oxide.

THE GEOLOGICAL SURVEY OF MISSOURI.

The Missouri State Board of Geology held a meeting at the Capitol in Jefferson City, recently. There were present Governor Stone, Dr. J. H. Britts, of Clinton; Prof. W. H. Seaman, of Rolla; Hon. W. O. L. Jewett, of Shelbina, and Prof. E. M. Shephard, of Springfield. The forenoon meeting was devoted entirely to the approval of accumulated accounts and routine matters. In the afternoon the matter of printing reports of the Geological Survey and continuing field work was taken up and disposed of as follows: It was determined to publish the reports on Lead and Zinc at the earliest practicable date and the manuscript will be ready for the printer by April 19th. Owing to the fact that the funds of the bureau are perilously low, these reports will not be bound. The sheets of the Bevier Coal Mines and the Iron Mountain Iron Mines will also be published. The report on Paleontology will also be published, but not bound. A little figuring developed the fact that the board had at its disposal but $8,200 with which to print reports and continue the survey. The printing of the Lead and Zinc reports and the Coal and Iron sheets will cost about $2,400, and after other items are deducted there will be about $4,000 left to continue field work.

It was determined to have the report on building clays completed during the summer, and possibly the report may be published. It is not the intention of the board, however, to discontinue the field work after June 1st, as has been stated. The work will be prosecuted during the summer, but will be limited somewhat on account of lack of funds. The next meeting of the board will be held April 19th.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Supreme Court of the United States.

Exception of Mines and Mining from Town-Site Patent.

In order to except mineral lands from the operation of a town-site patent, they must be known to be valuable for mining purposes at the date when the patent takes effect; and it is not sufficient that they have once been valuable for mining purposes, or are afterward discovered to be still valuable therefor. When a quartz ledge, known to be gold-bearing, and to have been profitably worked prior to the acquisition of a town-site patent in the year 1869, and not then worked out, is situated within the exterior boundaries of the patent, "the rights of the government and its mining grantees are not limited to such actual mining or tunnel possession as may have existed before the town-site patent, or to any continuance of a mining claim or possession by prior locators or their grantees, but the government owns and can grant the right to any quartz mine or gold-bearing ledge which was known to exist and to be valuable for minerals before the town-site patent was obtained, and which was not worked out when the town-site patent was obtained; and the rights of a subsequent locator under the government, by virtue of its reservation of the mine, and of the mining acts of 1866 and 1872, include a reasonable quantity of surface for the convenient working of the ledge, not exceeding 300 ft. on each side thereof."—Dower vs. Richards, 14 Supreme Court, Rep., 452.

The Harper's Ferry Bridge.—The old iron bridge crossing the Potomac River at Harper's Ferry, which has been used by the Baltimore & Ohio Railroad for many years, has been bought by a company consisting of Judge Daniel B. Lucas, Major A. W. McDonald, Col. R. P. Chew, Capt. George Baylor, Col. Forrest W. Brown and others. The price paid was $10,200. It is the intention of the company to convert it into a road bridge. This bridge is of a type only found on the Baltimore & Ohio and a few Southern roads—the Bollman truss, built by Mr. Wendell Bollman, of Baltimore.

THE WEBER GAS AND GASOLINE ENGINE.

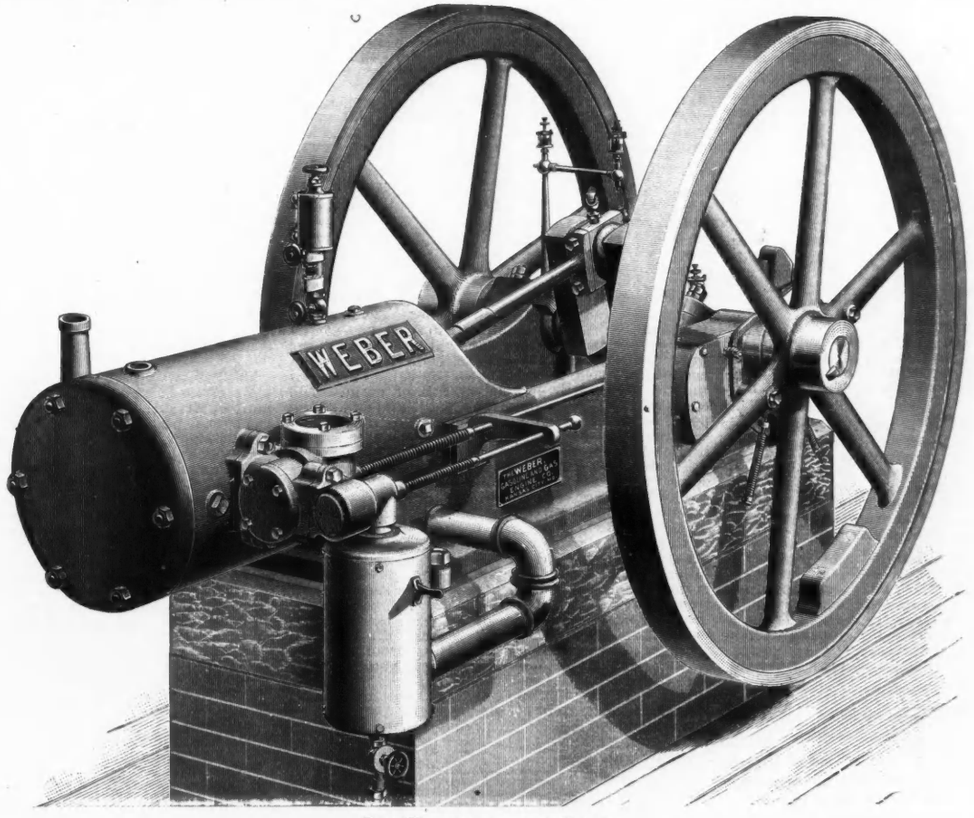
The accompanying illustration shows a gasoline engine of 55 H. P. manufactured by the Weber Gas and Gasoline Engine Company, of Kansas City, Mo. This engine, as shown in the engraving, is of simple design and well proportioned. The cylinder bed and main bearings consist of one strong, symmetrical casting, making a very rigid and stiff engine, and one in which the alignment will remain perfect and lasting. The present engine is simply an improvement on the older form of the well-known Weber engine in which the explosive action of gasoline is used instead of that of gas to give motion to the piston.

The valves are direct acting poppet valves, requiring no cleaning or oiling; they lift squarely from their seats and cannot wear out. The valve gear and governor—which include all the working parts of the engine except the crank-shaft and piston—are encased in an iron housing, dust and grit proof, and are run constantly in oil, insuring complete lubrication. The crank shafts are made of steel and finished to gauge. The bearings are exceptionally large and well proportioned. An important feature in this engine is that water is kept in circulation entirely around the valve-seats and cylinder head, as well as around the cylinder, thus increasing the life of the engine by keeping it always cool.

In this engine the gasoline is used in its natural state with no intermediate gasmaking machinery or appliances. The gasoline is kept in a galvanized iron tank, which is usually placed outside of the building, connection being made direct from the tank to the cylinder of the engine by a small iron pipe; thus the gasoline is always between solid iron walls from the time it is put in the tank until it is exhausted into space through the escape pipe from the cylinder, where it has been consumed. Should the engine accidentally become stopped and all valves left open, not a particle of gasoline would escape. The consumption is under perfect control of the governor, which allows the gasoline to enter the cylinder only as called for by the load on the engine. In the Weber engine no apparatus is used to carbonize the air or vaporize the gasoline, since such apparatus will, under certain conditions, fill with dangerous mixtures, which frequently explode. Gasoline only becomes a dangerous commodity when mixed with a proportion of air, but this can only occur in the "Weber" inside of the heavy iron cylinder of the engine. Safety is secured by excluding all air from contact with the gasoline until it is admitted to the engine cylinder in fluid form, where it is suddenly mixed with a large volume of air and is ignited. Safety is also secured by providing against any possible leaks in the pipes between the engine and tank. The tank is generally placed outside of the building, at any reasonable distance away, and when filled no fire or light need, of course, be near.

Another feature in this engine is that changes in the temperature do not affect its running, as no so-called vaporizers, carbonizers, carbureters or gas machines are used. Constant regulating of the gasoline and air is dispensed with, nor is there any water or gasoline remaining in the tank unfit for use. This engine, it is claimed, is the only one in which the point of ignition is changed while the engine is in operation, thus effecting a considerable saving. This feature is especially protected by patent.

Engines of this type are built of many sizes, from 4 up to 110 H. P. A number are in use in coal mines in Missouri and Kansas, and one has been in use for several months by the Marengo-King Mining Company, in San Bernardino County, Cal., doing excellent work. An engine of the size shown in the engraving (55 H. P.) in operation at Boonville, Mo., consumes regularly 200 gals. per week, or 33⅓ gals. per day, of gasoline, the average running time being 14 hours daily, six days in the week. From this the cost of running an engine can readily be computed, the price of the gasoline, of course, varying according to locality. It must not be forgotten that no steam plant is required.



THE WEBER GASOLINE ENGINE.

PATENTS PUBLISHED IN 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 17th, 1894.

4,310 of 1893. Manufacture of Zinc Oxide. Andrew Gray, Glasgow.
6,219 of 1893. Improvements in the Basic Bessemer Process. H. Wild, Peine, Germany.
8,042 of 1893. Stamp Batteries. C. Raleigh, Johannesburg.
8,057 of 1893. Smelting Iron Ores with Gaseous Fuel. A. Sattmann and A. Homatsch, Donawitz, Styria.

PATENTS GRANTED BY THE UNITED STATES PATENT OFFICE.

The following is a list of the patents relating to mining, metallurgy and kindred subjects issued by the United States Patent Office:

TUESDAY, MARCH 20TH, 1894.

516,662, 516,663. Ore Roasting and Smelting Furnace. Jacob J. Storer, Helena, Mont., Assignor to the United Mill and Furnace Company, of Montana.
516,664. Fume-Arrester. Jacob J. Storer, Helena, Mont., Assignor to the United Mill and Furnace Company, of Montana.
516,674. Apparatus for Separating Volatilized Metals from other Commingled Gases. Fessenden C. Butterfield, Minneapolis, Minn., Assignor of three-fourths to Louis S. Cass, Summer, Iowa, and Daniel B. Burdett, Minneapolis, Minn.
516,697. Dredge-Bucket. Erastus S. Bennett, Denver, Colo.
516,698. Cable-Carrier. Henry H. Bliss, Washington, D. C.
516,702. Conveyor. John H. Franklin, Columbus, O., Assignor to Joseph A. Jeffrey, same place.
516,707. Paratolyldimethylpyrazolone. Ludwig Knorb, Jena, Assignor to the Farbwerke, vormals Meister, Lucius & Bruning, Höchst-on-the-Main, Germany.
516,710. Agglomerated Iron Ore and Process of Making same. Richard H. Sanders, Philadelphia, Pa.
516,713. Electric Device for Pumping Oil Wells. Harry F. Waite, New York, N. Y.
516,735, 516,736, 516,737. Shape Metal Cutting Machine. David Hammond, Canton, O.
516,748. Furnace. Oscar Wagener, St. Mary's, O. Assignor to the Industrial Chain Company, same place.
516,781, 516,782, 516,783, 516,854. Ore Roasting Furnace. Thomas Walker and John F. Carter, Philadelphia, Pa. Assignors to John A. Barham and Joseph A. Vincent, same place.
516,816. Steam Boiler. George W. Johnson, Geneva, N. Y.
516,840. Electrically Operating Pump. Cyrus Robinson, Lynn, Assignor to the General Electric Company, Boston, Mass.
516,872. Hydrocarbon Burner. Edwin G. Mummery, Detroit, Mich. Assignor of one-third to John S. Sherman and George H. Harms, same place.
516,952. Drilling Machine. John Trounson, Minersville, Pa.
516,962. Cupola Furnace. William H. Bradley, Mingo Junction, O.
516,974, 516,975. Steam Boiler Furnace. John Milton, Washington, D. C.
516,977. Well-Drilling Machine. Charles A. Ray, Providence, R. I., Assignor to the Ray Artesian Well and Machine Company, same place.
517,001. Mode of Producing Nitrate Acid and Metals from Nitrates. John D. Darling, Philadelphia, Pa., Assignor of one-half to Harry C. Forrest, same place.
517,008. Hydraulic Crane. Frederick V. Matton, Camden, N Assignor to the Camden Iron Works, same place.

PERSONALS.

Mr. Mark B. Kerr, mining engineer, has gone to Ecuador on professional business.

Mr. Chas. S. Steele, of New York, is now at Cleveland, Tenn., prospecting for lead and zinc ore in Bradley County.

Mr. Emil Granier, a well known Frenchman, who has been extensively engaged in gold mining operations in Wyoming, is very dangerously ill at his home in Paris, France.

Mr. W. M. Nesbitt has been appointed superintendent of the Bullion-Beck & Champion mine at Eureka, Utah, and Mr. Truman Schenck has been appointed mill superintendent.

Mr. S. I. Hallett, manager of the Smuggler Mining Company, Aspen, Colo., has been appointed manager of the Park-Regent, also at Aspen, in place of Mr. F. Buckley, who has resigned that position.

Capt. John Reibel, of the Messaba range, has been appointed superintendent of the Platt mine, and succeeds Mr. Edward Ball, who resigned to take a position with the Minnesota Iron Company at Soudan, Minn.

Mr. Roger Prendergast, superintendent of the Sierra Nevada Mining Company and Union and Ward Shafts on the Comstock Lode, has gone to southern California hoping to benefit his health, which has been very poor of late.

Mr. R. N. Dickman, of the firm of Dickman & Mackenzie, of Cleveland and Chicago, is at present in Arizona, where he is examining some gold properties for Northern capitalists. He will on his return also examine some properties in California and Cripple Creek, Colo.

Col. T. W. M. Draper and party have returned to New York from Ecuador, where they went to inspect the gold placer property of the Cachivi Mining Company at Esmeralda. Colonel Draper has made a very thorough examination of the ground and has prepared plans for working it on an extenscale.

Mr. Lewis F. Bostelmann, who was at one time on the staff of "The Engineering and Mining Journal," and for the past ten years has been secretary and treasurer of the American Diamond Rock Boring Company, has now established himself in business, at 39 Cortlandt street, New York, dealing in black diamonds and diamond drilling machinery.

Chief Engineer Nathan P. Towne, U. S. N., has resigned his office in order to accept an important position in the engineering department of the Cramp shipbuilding yards in Philadelphia. Mr. Towne has served in the Navy for 32 years, and has taken a prominent part in designing the machinery of the new vessels, having been for four years principal assistant to Engineer-in-Chief Melville.

Mr. John Walker, who founded and was for a long time connected with the Walker Manufacturing Company, of Cleveland, O., has been appointed general manager of the Fraser & Chalmers Company, of Chicago and London. Mr. Walker has had much experience as a mechanical engineer and has acquired a high reputation both in this country and in England in that capacity and as an inventor and designer of machinery.

OBITUARY.

Frank Williams, a well-known mining operator of Denver, Colo., died on March 23d, aged 48 years.

Josiah Keim, a well-known building contractor, died on March 28th at Pottstown, Pa., aged nearly 65 years. He did considerable contract work at mining shafts and furnaces in upper Chester County, Pa., and built several rolling mills and other heavy work in Pottstown. He owned extensive leases at the granite quarries at French Creek Falls.

Robert Neilson Clark, mining engineer, a notice of whose death was published in our last week's issue, was born at Philadelphia in 1848; he was educated at the University of Pennsylvania and began his professional work as an engineer in conection with the Pennsylvania Steel Company. He was later connected with the Lykens Valley Coal Company, besides doing other professional work in northern New York and the Eastern States. In 1872 he went to Colorado, where he developed the coal mines of the Denver & Rio Grande Railroad Company and the Colorado Coal and Iron Company, after which he was made manager of the Crysolite mines at Leadville. He remained in this position until 1887, when he removed to Pittsburg, Pa., where he devoted himself to the development of the Bower-Barff process, and in 1892 became a member of the firm of White & Clark, consulting engineers. He was for three years secretary of the Engineers' Society of Western Pennsylvania, and was one of the oldest members of the American Institute of Mining Engineers. At the time of his death Mr. Ciark was devoting himself to the consideration of the treatment of gold ores, and his death removes from the list of the profession one whose results could always be relied upon, due to his careful and conscientious methods of investigation. Mr. Clark's interest was in everything that in any way tended to the public advantage as was shown in his origination of the movement for the improvement of the water supply of Allegheny County, Pa., and the great success attending his efforts for the extension of the work of the Engineers' Society, the chemical section of which was founded largely by his efforts. His large experience and painstaking methods made his advice valuable to his clients, and especially so to young engineers in whom he always took special interest. He possessed all the attributes of the true engineer, first-class ability, strict integrity, studious habits and the patience to do careful conscientious work. Of his personal character it was all that a man should be; of him it can be truly said he was "without fear and without reproach."

SOCIETIES AND TECHNICAL SCHOOLS.

Scranton Engineers' Club.—At the regular monthly meeting, March 10th, the paper for the evening, by Mr. Bartl, C. E., was read, the subject being the underpinning of the new high school in Scranton, which is to be erected over the abandoned workings of an old mine. Mr. Bartl's plan, as described in his paper, and as now being carried out, is as follows: Careful surveys were made on the surface and carried into the mine to fix the location of the proposed building in reference to the workings underneath. A shaft was then located and sunk to an old chamber under one corner of the lot; down this shaft the filling and materials for the work are being lowered. All the workings underneath the lot upon which the building is to stand are to be entirely cut off from the rest of the mine by a system of masonry walls laid dry, and to be built of the gob or refuse from the adjoining workings. The gangway and chambers under the lot thus walled off, are then to be filled tight to the roof, and afterward the shaft itself will also be filled to the surface. The filling will consist mainly of refuse from the mine, but dirt, gravel and culm, or coal waste, will be used in the following manner: The vein of coal under this point has a dip of 10°. The filling (after the dry walls are finished) will be started at the low point inside the walls, and when it has reached within a foot or so from the roof, the remaining space, together with the voids in the filling already in, will be slushed full of culm. The culm will be thrown down the shaft and run to the point being filled in chutes, where it will be forced into the heavier filling by water. The water will be brought down the shaft by hose from the fire hydrant on the surface, and after having carried the culm into the voids of the coarser filling, will pass off through the dry walls and follow down the dip of the vein. It is claimed that a filling of this kind will, after it has dried out, harden into a compact mass, capable of resisting great pressure, being kept in place by the walls and pillars, and in turn keeping the pillars from giving way. In the workings of the second vein from the surface, which is 112 ft. below the first vein (the intervening strata being very hard rock), the idea is to simply fill the old chambers full to the roof with refuse from the adjoining workings, which will not only help to support the roof, but keep the remaining pillars of coal from from splitting off at the sides and ends. Mr. Bartl illustrated his plan by the aid of very elaborate drawings. The paper called out much discussion, which was taken part in by nearly all of those present.

INDUSTRIAL NOTES.

The Valentine Iron Company, at Bellefonte, Pa., will put its furnace into blast on April 2d.

The Bellefonte Furnace Company, Bellefonte, Pa., is preparing to put its furnace in full running order by April 1st.

The Avis Chair Works, at Avis, Va., expects to move into its new plant about May 1st, its 10-year lease on the present works having expired.

The Painsfoe Chemical Company, of New York, has been organized with $25,000 capital stock. The directors are Wm. Phelps, Charles M. Phelps and M. C. Webber.

The Indiana Steel Company, it is reported, will locate a steel manufacturing plant at Frankton, near Elwood. It is owned by Pittsburg and Chicago capitalists. The capital is $100,000.

The Franklin Institute, of Philadelphia, has appointed Dr. Sadtler and Dr. Leffman as experts to examine the various kinds of asphalt which may be submitted in competition with Trinidad asphalt.

The New York, Mobile & Mexico Steamship Company, recently organized, will operate a line of steamers between Mobile, Ala., and Tampico, Mexico, thus affiording another outlet for Alabama coal and coke.

Wharton Furnace, at Port Oram, N. J., went out of blast recently with no prospect of resuming for a considerable time. The furnace has been in blast about 14 months, producing 34,000 tons of iron. The reason given for going out is that the lining is in bad condition.

The Lebanon Rolling Mills, Lebanon, Pa., resumed March 26th, the puddlers having agreed upon the following scale: Stove plate and swarth, $2.50 per ton; pig iron and heavy castings, $2.75 per ton; scrap, $1.35 per ton. The West End Rolling Mills started also on a $2.50 basis.

The Grand Rapids Munafacturing Company is being organized with a capital stock of $50,000, for the manufacturing of railroad gates, frogs and hydraulic switch blocks. It is expected the plant will be in running order by April 1st. Those interested in the organizati on are Luman Tenison, Martin L. Sweet, Charles D. Stabbins, Chas. R. Sligh and Chas. Cobb.

A press dispatch from Pottstown, Pa., says that the Glasgow Iron Company will resume in their puddle department and Valley Rolling Mill, giving employment to about 200 men. Both these mills have been idle since last autumn. The plate mill of the company has been running almost steadily. The new 65 in. plate mill of the Pottstown Iron Company started up on March 26th, giving employment to 100 hands.

The Berlin Iron Bridge Company, of East Berlin, Conn., is doing considerable iron bridgework at the present time. Among other contracts are 17 signal bridges for the Boston & Maine Railroad; two bridges 200 ft. long for the town of Roxbury, Conn.; a bridge 400 ft. long across the Connecticut river at Stratford, N. H., a bridge 350 ft. long at Turner, Me.; a bridge 200 ft. long at Houlton, Me., and a bridge 200 ft. long at Moosup, Conn. The same company is building a new car-shed for the Colonial Street Railroad at Kingston, N. Y.

Incorporation papers have bave been filed by the A. B. Frame Water Wheel Company, with its principal office at Muscatine, Ia., and a branch office in Chicago. Officers of the company are: G. A. Funk, president; I. A. Kerr, vice-president; Warner Smeenk, of Chicago, treasurer; W. T. C. Hyde, of Chicago, secretary, and A. B. Frame, of Boyden, Ia., general manager. The company is capitalized at $100,000. The company will use the Frame patent current wheel, using the current of the river as motive power. Work upon the first wheel will be commenced at once, and it will be put into the Mississippi River at some point near Muscatine.

The current report that the General Electric Company has secured a contract from the Cataract Company of Niagara to supply it with electrical apparatus for use on boats on the Erie Canal is an error. This company has arranged to install a 2,000 H. P. plant at the new works of the Pittsburg Reduction Company. These works will be located at Niagara Falls about 2,500 ft. from the power house of the Cataract Company. The apparatus to be furnished is for transforming the high voltage (2,500 volts), two-phrase current, into a low voltage, continuous, constant potential current of 160 volts. The installation will consist of eight 200 K. W. step-down stationary transformers, four 500 H. P. rotary transformers, and two white marble switchboards with the necessary appliances.

A dispatch from Concord, N. H., says that the terms of the agreement reached between the Milford (Mass.) branch of the Granite Cutters' National Union and the New England Granite Manufacturers' Association, which settles the strike that has been in existence for nearly two years in the works of Norcross Bros., Woodbury & Leighton, Darling Bros., John Clark, James Stella, Harry Clark, James Malony and John McQuaill, are in the main the same as those contained in the Stony Brook (Conn.) agreement, recently completed. With regard to non-union workmen the following clause is inserted: No discrimination shall be made between union and non-union men on the part of the granite cutters and tool sharpeners of Milford and its vicinity, provided that the granite manufacturers of Milford on their part agree not to discriminate against any member of the Granite Cutters' National Union, or against any of its members who may have served in any capacity on any committee of the Milford branch, or any member who may have made himself prominent during the present suspension of business. It is understood and agreed, in explanation of the stipulation, that the union men shall not interfere with the non-union men to prevent the free pursuit of their work, and will work with and give such men any assistance necessary in the performance of their work.

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.

A press dispatch from Pittsburg, Pa., says that President John McBride, of the United Mine Workers of America, has issued a circular call for the fifth annual convention of the organization to be held at Columbus, O., commencing April 10th. The convention will be the most important convention yet held, for a "national movement" will be considered. This means the total suspension of work by miners from Colorado to Eastern Pennsylvania.

For several months the officials have been preparing for the national movement. It is expected in the Pittsburg district alone that the 12,000 miners and coke workers of the Connellsville region and the 8,000 river and railroad miners will be organized. The same is said to apply to the Ohio, Tennessee, West Virginia, Indiana, Illinois and Missouri coal fields.

ALABAMA.

Randolph County.

(From our Traveling Correspondent.)

There is some prospect that some of the mica deposits in this county, near Pinetuckey, will be worked during the coming season more extensively than ever before. R. E. Merrill, of Pinetuckey, has been mining this mineral steadily since last August, and found a ready market for his product at fair prices. A buyer for stove men has been in the locality nearly all the time, for several months past, purchasing cut mica for use in stoves, but the output has been inconsiderable in proportion to what it will be if negotiations now pending are successful.

The gold properties in the Goldberg mining district on Crooked Creek, near the junction of that creek and the Tallapoosa River, are still being prospected; but during the winter the work has been inconsiderable, although some experienced metallurgists have been sampling and testing the ores in the different locations very thoroughly. This work has demonstrated that chlorination, as worked by John Rothwell at the Golden Reward plant in Deadwood, S. Dak., will probably prove the most desirable. The reason is that the free gold carried by it is fine and is hard to save by amalgamation, because of its fineness. Several new discoveries have been made since last fall, and this immediate district is proving to be one of the most extensive in either Georgia or Alabama.

Pinetuckey Mining Company.—This company has elected a new board of directors and president, and will commence active operations very shortly. It is not known yet whether the company will work the mine or lease it. This latter has been the course adopted last year, and because of inexperience and lack of capital on the part of the lessees, resulted in loss. The mine is one of the oldest locations in Alabama; and although the ore body, a segregated vein, is thin, only averaging about 10 in., yet it is quite rich, ore having been milled that yielded $40 a ton, even when treated by inexperienced amalgamators. The slate-hanging wall, in spots, has milled profitably. The ore is highly sulphureted and does not yield really a fair percentage of its assay value by amalgamation alone, but no satisfactory system of concentration has been used in the past, so that the value of the property remains still to be determined, both by deeper work and treatment of the ore. At present the cost of mining, as it has been carried on in the past, is in excess of what it should be, owing to the thinness of the vein and extreme hardness of the slate country rock. There is a good 10-stamp Fraser & Chalmers mill on the property, but this has stood idle since last November because of the failure of the lessees to run the mine at a profit. I understand the company propose to continue sinking on the abandoned shaft in the mill house, which is down 60 ft., and it is estimated that the ore body will be exposed at the depth of about 125 ft.

This will open up the mine 70 ft. deeper than the present workings, and expose about 200 ft. of virgin ground on the dip of the vein, between the old workings, 55 ft. deep, and the bottom of the mill-house shaft. The outcrop shows that the vein is over one mile in length, and at the depth of the old workings drifting has determined its continuity for upward of 200 ft., but its continuity in richness has not been maintained uniformly.

Walker County.

Mountain Valley Coal and Coke Company.—This company has been incorporated by T. T. Hillman, of Bingham; H. E. McCormack, of Jasper, and C. A. Nolan, of Pratt City. Mines will be opened in Walker County, where the company has secured coal lands. A battery of coke ovens will be erected.

ARKANSAS.

Columbia County.

A collection of the clays of this county has been undertaken by a citizen of Magnolia, and some 12 or more varieties of valuable clays secured already.

CALIFORNIA.

Humboldt County.

The mines along the Klamath and vicinity of Orleans are reported to be doing well, and the miners will be supplied with water until probably the last of July.

Los Angeles County.

Pomona Mill and MiningCompany.—This company has been incorporated at Pomona, Cal., with a capital stock of $2,000,000. The directors are: E. R. Smith, W. D. Smith, E. Henderson, P. J. Tarr and V. E. White, of Pomona; M. Maxon, of El Monte, and E. E. Powers, of Los Angeles.

Mono County.

Bulwer Consolidated Mining Company.—The latest weekly official letter says: We finished crushing ore on the 13th inst. We are now working ore concentrates and tailings. Ore crushed during the run, 190 tons. Taking 10% off for moisture leaves 171¼ tons net. Crushed the past week, 29¼ tons, the average battery assay of which was $22.50 per ton; tailings $8.81 per ton.

Nevada County.

Maryland Mining Company.—Grass Valley.—According to the Nevada City "Transcript," the full force formerly employed at the Maryland mine will be at work again by April 1st and operations will go ahead again on as large a scale as ever. The machinery and buildings which were destroyed by fire several weeks ago have been replaced and the plant is put in first-class shape. About 200 men were employed at the Maryland before the disaster occurred.

COLORADO.

Mineral surveys approved by the United States surveyor general for Colorado during the week ending March 17th, 1894: 8746, Central City, Silent Friend; 8792, Del Norte, Rondo; 8847, Pueblo, Goodnight; 8848, Pueblo, Morning Glory; 8849, Pueblo, A. & B., Pueblo, Kid lode and Albert I mill site; 8721, Pueblo, Reno, Pet, T. E. Merit and Bon Ton lodes; 8802, Pueblo, Jennie Lynd; 8760, Pueblo, Homestake; 8804, Gunnison, Gold Vale placer; 8808, Pueblo, Marion and Carolyn lodes; 8723, Pueblo, Scalene.

Boulder County.

Boston and Baxter.—The Boston and Baxter mines at Ward have been sold to an Eastern syndicate. The Boston was formerly owned by B. Slack, of Denver, and was thought to have been sold some 18 months ago to a party of Chicago capitalists, but the sale fell through. It was lately taken under a long lease to D. F. Sullivan, J. McDonald and John Murchson, who have sold their rights to the new owners for a good compensation. The price is said to have been $150,000. Work will start up shortly on an extensive scale.

Dolores County.

Rico-Aspen Consolidated Mining Company.—Notwithstandig the low price of silver the receipts from ore of this company are said to be increasing each month on account of the increase in the per cent. of gold per ton. The shipments at present aggregate about 50 cars per month (10 ton capacity), being in two grades. The high grade, handled at the Omaha & Grant smelter in Denver, is now averaging $60 in gold and 250 oz. in silver per ton. The second grade ore, handled at Durango, averages about $19 per ton in gold and 80 ozs. in silver. The second-class ore is extracted from heretofore virgin territory of this company, which has just been opened, and as upraises to the contact are made on the new strikes, known ar the Silver Glance No. 1 and Star No. 3, the ore is said to be increasing in value. It is proposed on June 1 to again begin sinking for what is known as the second or lower contact.

Eagle County.

Belden.—This property has increased its force and will continue development, but pending a revival in the lead industry only enough ore will be shipped to meet expenses of opening up new territory.

Eagle Canon.—Considerable activity is reported of the fissures of Eagle Canon. Of these the California made a shipment recently that run 22% copper in conjunction with its gold and silver values, and the Blossom fissure last week opened a new streak of ore which is said to assay $30 per ton, while the Smitheram Brothers are well satisfied with their last shipment from the Alpine. On East Battle Mountain McCrea & Co., of Aspen, are pushing work vigorously on the Esmeralda group. The Little Chris management is driving a crosscut; prospects are very bright on the Matchless and the force has been increased. The Iron Mask Mine, which resumed some six weeks ago with quite a force, has closed down again on account of the low price of silver. Only the leasers are now working on the property, Manager Hall having completed arrangements for an indefinite shut-down.

Ground Hog, Red Cliff.—The Marshall-Quirk lease has opened a channel of ore 6 ft. wide and 3 ft. thick and rich in gold. The top and bottom of the chute is ferro-manganese. The country is open territory and the channel bears a strong resemblance to the natural adits of early quartzite days which made the camp famous as a gold producer. As to the other leases, King and Anderson have opened up a big chute of talc ore and are now in it with the other sections of the mine. The Stonebreaker lease has a large channel of low grade sulphide whose bearing indicates an immense body of oxidized ore when the changing point is reached. The modification of the injunction against the Forgey and Nottingham lease has given those lessess the privilege to go ahead on their ore channel and in each place a body of high grade gold ore disclosed.

Tip Top.—Manager Good, of the Tip Top combination, is operating on both the Tip Top and Star of the West. Considerable ore is being taken out of the upper workings and the rise work in the tunnel is progressing. A head house at the mouth of the tunnel is being constructed, and the enterprise is getting in shape for an active season.

El Paso County.

Ophir Mining and Milling Company, Cripple Creek.—The annual meeting of this company was held at Colorado Springs on March 20th. There were 600,000 shares of stock represented. Secretary E. F. Wells made a general report of the work of the year and the present condition of the property. About $3,000 has been received during the year from various sources, and 400 ft. of development work done on the two claims of the property, the Carbonate Queen and the Dead Pine. Several veins have been opened up on both properties. The directors have given a bond and lease on the Carbonate Queen for one year for a total optional price of $60,000, to be paid in monthly installments. In addition to the partial payment, royalties of 15, 20 and 25% are to be paid to the company. The following directors were elected: F. F. Horn, J. K. Miller, J. K. Fical, E. W. Fical and E. F. Wells. The officers are: Fred F. Horn, president, B. W. Fical, vice-president, E. F. Fical, treasurer, and E. F. Wells, secretary.

Lake County.

Bohn Shaft.—It is reported in Leadville a powerful combination of local capital will undertake the operation of the Bohn shaft and the Sixth street shaft in the near future.

Marion.—The lessees of this property at Leadville encountered a body of good iron pyrites which makes it desirable as smelting ore. The strike was made at a depth of 1,020 ft., making its working ore body the deepest in the camp. The lessees have been sinking steadily for the past 15 months.

Solyx Tylee.—A good strike is reported at this property in granite district.

(From our Special Correspondent.)

The section of Breece Hill now attracting the most attention is known as Idaho Park. It is bounded on the northeast and east by the Colorado Prince and Bald Mountain faults, and on the west by the Weston fault. There are at present working in this neighborhood the following shafts: Ibex Mining Company's Nos. 1, 2 and 3; the Garbutt shaft; the Little Vinnie; the Fanny Rawlings; the Eliza, and the Curran shafts. Of this number five have already shipped considerable gold ore.

Dunkin.—Only a few men are now working and no ore is being shipped.

Far Down.—Lessees have the shaft down 280 ft. in parting quartzite. They expect to encounter the famed ore chute of the Walcott.

Harvard.—Work is now being pushed forward rapidly in hopes of catching a northern extension of some of the rich ore chutes of that section.

Maid of Erin.—The enormous flow of water still keeps up and 1,600 gals. per minute are being pumped.

M. E. C.—The new lessees are down 235 ft. Small streaks of lead and iron ore giving a paying percentage of gold are being encountered.

Stars.—A few lessees are working, but no shipments can be made owing to a heavy loss with silver as low as it is.

Thespian.—The first contact has been thoroughly explored and a winze is now going down in the lime.

Union Smelting Company.—These people now have three furnaces in blast and are also preparing for the erection of a sampling works in connection with their smelter.

Walcott.—The present working level is at a depth of 257 ft., and here are found some of the largest bodies of ore. The chute is dipping westward and a winze is being sunk to catch the ore body on its dip. At present 100 tons of dead ore daily are being hoisted through the Esther shaft. The entire output for March will be 2,500 tons.

Saguache County.

Little Dickey.—At this property, on Ford Creek, the shaft is down only 12 ft. but starts from the end of an open cut, thus giving 27 ft. under surface. The ore vein has increased from 28 to 32 in. of mineral, chloride and wire and brittle silver, and now shows a value of $300 in silver and $40 in gold to the ton. Timbering is going on and the shaft will be sunk 50 ft., when a drift will be started. This plan will be followed each 50 ft. of depth gained.

San Miguel County.

Smuggler-Union Mining Company.—The connection will be made by the Smuggler-Union between the Union shaft and Bullion tunnel very shortly, says the Telluride "Republican," and this will make available a block of ore 700 ft. deep by 1,500 ft. long. The Sheridan crosscut completed in 1891 cut the vein at a depth of nearly 1,000 ft., but the Bullion tunnel, being between 300 and 400 ft. lower on the vein, will open an additional ore body of large extent.

FLORIDA.

Putnam County.

Buffalo Bone Phosphate Company.—This company has been organized by Col. T. M. Weir, of Tampa, Fla. Some capitalists of Buffalo, N. Y., are interested.

IDAHO.

Boise County.

It is expected that the Crawford mill at Boise will commence operations during the coming week. The intention is to work only high-grade ores in

this mill, the lower grades being reserved for treatment by some other method.

Golden Star Mine.—The owners of this property are reported as having decided to run a cross-cut tunnel from Picket Pin gulch to top all ledges of the Goldon Star group at a depth of about 300 ft.

Homestake.—A report from Boise says that the lower tunnel in this mine, on Balbach's new property, has cut the ledge at 250 ft. from the surface. The strike is considered as important in establishing permanency of the vein. The ledge, when struck is 7 ft. wide and contains streaks of good concentrating ore and considerable fine milling ore. The mill at Homestake is now in position and active operations will be commenced shortly.

Old Mining and Milling Company, of Ola—Articles of incorporation for this company have been filed with the Secretary of State. The capital stock is $200,000, and the incorporators are John E. Russell, George H. Holbrook, John M. Holbrook, George Peron and M. Peron, all of Ola.

Kootenai County.

Poorman Mine.—This mine, one of the most important of the Cœur d'Alene district, is reported sold for $500,000 to an English syndicate. This is the first investment of English capital in this field. The terms of purchase are: $100,000 to be paid on April 1st; $200,000 in six months and the balance in a year. Hon. John F. Forbis, the present owners' legal representative, has gone to England accompanied by Mr. B. C. Kingsbury, one of the principal present stockholders, to complete the sale. The Poorman was purchased by the present proprietors five or six years ago. The owners put $11,000 into it for development purposes and formed the Cœur d'Alene Silver Lead Mining Company with a stock capital of 500,000 shares. It has paid dividends regularly until a few months ago, since when it has, during the trade depression, only paid expenses. The pay chute is 800 ft. long and the mine is developed to a depth of 700 ft.

ILLINOIS.

National Lead Mining and Smelting Company.—This company has been incorporated at Springfield, with a capital of $500,000. The incorporators are G. H. Griffin, John Bird, John A. Parsons and James O. Baird. The company will operate lead and zinc mines in Northern Illinois.

Cook County.

About 1,200 brickmakers are on a strike in Chicago and efforts have been made to draw out members of some other organizations. The trouble has arisen from a proposed cut of 10% in the men's wages.

INDIANA.

Vermillion County.

Anderson Coal Mines.—The miners at this mine, at Clinton, Ind., have agreed to go in on 38 cents per ton, run of mine, or 50 cents screened. This is 20 cents less than the scale fixed last May. The men will receive a reduction in house rent.

MARYLAND.

Allegany County.

George's Creek Coal and Iron Company.—The miners of this company, at Cumberland, have agreed to accept the proposition of the coal operators of 10 cents reduction per ton on coal.

Baltimore County.

National Mining and Milling Company.—This company has been organized in Baltimore, with H. C. Turnbull, Jr., as president; G. W. Gail, vice-president; Henry R. Turnbull, secretary; J. Appleton Wilson, treasurer, and Joel W. Benton, general manager, all of Baltimore; capital stock $100,000, $90,000 of which has been subscribed. The company proposes to mine and manufacture barytes, and has purchased large deposits of this ore in North Carolina and at Blacksburg, S. C. The old Popplein factory at Baltimore has also been purchased and is being equipped for an output annually of 12,000 tons of commercial barytes.

MICHIGAN.

Copper.

Calumet & Hecla Mining Company.—No. 10 shaft South Hecla is now in a good copper lode. This is looked on as a further proof of the value of the south land of the company.

Tamarack, Jr.—According to the Calumet "Conglomerate" the prospects at this mine are improving. No. 2 drift north, which was stopped last summer because of its poor prospect, has recently been started and has struck a lode 15 ft. wide containing some very rich streaks.

Gold.

Ropes Gold Mining Company.—The annual meeting of the shareholders of this corporation was held in Ishpeming recently. The report shows a net earning of $2,000 above the amount paid for assessments. The gross yield of gold and silver per ton was $2.85, and the tailings averaged $1.14 as against $1.64 of the previous year. About 15,000 tons of rock were milled during the year. The directors and other officers of the company are unchanged.

Iron—Gogebic Range.

Matters are improved in this range. The Norrie, East Norrie, Aurora, Pabst and Newport mines are giving employment to 1,300 men altogether. It is said the Tilden and Ashland will start shortly. The Iron Belt west of Hurley took on 75 men lately and will gradually increase the force to 300.

Iron—Marquette Range.

Lake Superior Iron Company.—At the annual meeting recently the following officers were elected: Frank Hibbing, president; W. D. Vernam, vice-president; A. J. Trimble, secretary and treasurer; and Frank Hibbing, general manager. The directors are Frank Hibbing, A. J. Trimble, W. D. Vernam, Peter Deyo, J. H. Agen, Marshall H. Alworth and George C. Squiers.

Messrs. E. A. Johnson and Shields McCarthy are preparing and will shortly publish a new map of Marquette on a scale of 400 ft. to the inch, which will be extremely useful to the community. It will show the entire city by additions; and wards, lots and the width of streets, etc., will all be shown.

Champion.—A suggestion was recently made regarding this mine, at present closed down, that it would be a good thing for the company and better than nothing for the men if work were resumed at $1.25 for miners, $1 for underground and 75 cents for surface labor. This suggestion was repeated as a proposition of Superintendent Fitch and believed by many. Nothing of the kind was thought of, it is stated.

Mitchell.—This mine, which was originally opened about 20 years ago under the name of the Shenango and has been a producer of high-grade ore ever since, shut down two weeks ago and threw 200 men out of employment. The output has been restricted of late by the dip of the deposit into the Winthrop property adjoining.

Iron—Menonimee Range.

Work is to be resumed at the Paint River, Monitor and Shaffer mines in the Crystal Falls district. Some 200 men will be employed.

Claire.—This mine has passed into possession of Angus Smith, the fee-owner, who will give 100 men work. Some 40,000 tons of ore have been sold. Miners will be paid $1.10 and laborers 90 cents per day.

MINNESOTA.

Iron—Mesaba Range.

(From our Special Correspondent.)

Biwabik.—It is stated here that Tod, Stambaugh & Co., Cleveland ore brokers, paid the royalties due the Lake Superior Consolidated from this mine and will operate it. The report cannot be affirmed here.

Lake Superior Consolidated.—Very soon stripping will recommence at the Mountain Iron and Rathbun mines. Work was discontinued in January. How largely they will be operated it is yet impossible to say.

Ohio.—This company, holding a 25 cent. lease from S. R. Ainslie, Chicago, and subletting to P. L. Kimberley and others, at 40 cents premium, has declared the sublease forfeited and taken possession. Mr. Ainslie now sues for a cancellation of the original lease, though the company claims he has been fully paid. The Buckeye Iron Mining Company, of New York, has obtained an interest in the Ohio, and will probably operate the mine up to the fee minimum of 30,000 tons.

Oliver.—Superintendent Florada states that the mine will be worked this season up as nearly as possible to its contract output of 400,000 tons. Work has not yet begun.

Sauntry.—This property in 5, 58, 17, is to have railroad connection soon.

Iron—Vermilion Range.

(From our Special Correspondent.)

Chandler.—This company is sinking a new No. 3 shaft. Ground about old No. 3 has been settling for some time. Men here have been raised 25 cents a day since the announcement of the sale of the year's output.

Minnesota Iron Company.—A gradual increase of force is taking place.

Redwood County.

Reports state that G. F. Kiavik has discovered a 14-in. vein of asbestos about four miles north of Belview, on the Minnesota River.

St. Louis County.

(From our Special Correspondent.)

The alleged gold finds on the shores of Rainy Lake, along the northern boundary of this and Itasca counties, have already resulted in just what—in all probability—is all many of the discoverers desired, that is a boom in town lots. Whether there is gold in paying quantity cannot, of course, be told for months; samples so far analyzed do not run as rich as samples should. A small stamp mill is being taken in, and after the snow goes, so that explorations can be carried on and the stamp mill gets to work, the region can be sized up fairly well. Notwithstanding the fact that there is 100 miles of sleigh and foot transportation from the end of the railroad, that supplies are very scarce and expensive, and that the weather has been arctic, there are now at least 500 men at the new town, which is only 60 days old and is already asking organization.

MISSOURI.

Jasper County.

(From our Special Correspondent.)

JOPLIN, March 26.

The production from the mines of this lead and zinc district was fully up to the average, but the zinc ore market was very dull and on the decline, so that the large operators held most of their production. Some few sales of zinc ore are reported at $19 per ton, but the average of the district was not over $17 per ton. Lead ore was in good demand all week at $18.25 per thousand. Following are the sales of ore from the different camps: Joplin, 1,354,670 lbs. of zinc ore and 666,340 lead, value, $23,675; Webb City, 261,080 lbs. of zinc ore and 52,810 lead, value, $3,169; Carterville, 844,320 lbs. of zinc ore and 165,710 lead, value, $10,158; Zincite, 74,660 lbs. of zinc ore and 11,850 lead, value, $812; Oronogo, 72,270 lbs. of lead, value, $1,158; Carthage, 201,000 lbs. of zinc ore, value, $2,010; Galena, Kan., 940,670 lbs. of zinc ore and 213,230 lead, value, $10,794; District's total value, $51,776.

Messrs. Lear & Lichliter, of Joplin, have recently opened up a 200-acre tract of land between Joplin and Webb City; they have already made a considerable development and found a large body of ore, and during the past three weeks have been building an ore dressing plant, which will commence cleaning ore to-day.

New development is being made in almost every direction around Joplin, and there is a marked activity generally, nothwithstanding the low price of zinc ore.

Harrison & Spencer Mines.—These mines are located two miles due east from the city of Jophin on a 40-acre tract of land adjoining the Rex Mining and Smelting Company land on the north. Messrs. Harrison & Spencer secured a lease on this 40 acres from Wm. M. Leckie about one year ago. At that time the land was entirely undeveloped. Harrison & Spencer commenced prospecting by sinking shafts, and very soon opened up very large deposits of free zinc ore, owing to the shallow depth at which the ore was formed, miners subleased lots from the original leasers so that a number of shafts were soon in ore. It required some little time to get wash places and other surface improvements in working order, so that the first sale of ore was made June 10th, 1893, and from that date up to December 31st, 1893, the mines had produced 2,522,160 lbs. of zinc ore and 482,270 lbs. of lead ore, or a total value of $33,914. From January 1st to March 24th, 1894, the mines on this land have produced 1,225,160 lbs. of zinc ore, and 365,840 lbs. of lead making a total value for this year of $17,601, and a grand total received from the sale of ore in the past nine months of $51,515.

Mr. William M. Leckie, of this city, is the owner of this land and also the 40 acres adjoining on the north, which is held under lease by Jacobs Brothers, of Carthage, and has been one of the largest producers of lead during the past year in this district.

MONTANA.

Beaverhead County.

Polaris.—A report from Marysville says that this mine will be further developed by driving a tunnel 2,900 ft. to tap the ledge at a vertical depth of 675 ft. Nearly 1,500 ft. of the tunnel have been completed, and work is continuing at the rate of 80 ft. per month.

Choteau County.

Black Diamond Coal Company.—This company has completed its contract to supply coal to the Government at Fort Assinniboine and has ceased operations for the present. The company has driven a tunnel for 800 feet and finds the run to average 7 ft. and improve as the tunnel progressed. The mine is 17 miles from Fort Assinniboine and 7 miles from Havre.

Deer Lodge County.

Gold Creek Placer Mining Company.—Col. M. S. Parker, manager of the company, has started for the diggings with two experienced miners and a large stock of provisions. Sluicing will begin as soon as the weather permits. The property is considered valuable as good mines have opened both above and below.

Gallatin County.

George W. Ballou, representing a New York syndicate, is reported as having purchased a large number of gold, silver, copper and iron mines near Bozeman. The price named is $1,000,000. It is understood that the mines will be extensively developed and large concentrating works erected.

Granite County.

Bloomington.—It is reported that a rich strike has been made at this mine in the Royal district. In cross-cutting at a depth of 400 ft., a large vein was exposed, in which the quartz contained considerable free gold. It is said that a rich find has also been made in the Esperanza tunnel of the same mine.

Royal Gold Mining Co.—The last fortnightly clean-up on March 15 yielded $12,000. Of this $7,000 was paid in dividends, making $17,500 in dividends this month. About 40 men are now employed at the mine and at the 12-stamp mill.

Jefferson County.

A group of mines in Montana near Whitehall Station on the line of the Northern Pacific Railroad have been purchased by a New York City syndicate for $500,000. These mines carry gold, silver, copper and a considerable quantity of iron.

Madison County.

A placer claim in Prickly Pear Creek, near Virginia City, has been opened by Thomas H. Carter and others. This section was extensively worked in the early days of placer mining, but the bed of the stream has received little attention because of the expensive machinery necessary to handle the large inflow of water.

Golden Star Gold Mining Company.—This company, which has had two shifts of men steadily at work for some time past, has let the contract for the reduction plant, and it is expected that within a short time the plant will be placed at the property. There is a large quantity of ore at the mine waiting to be treated.

Missoula County.

The Oro Fino Mining and Smelting Company is opening a promising gold mine in Deer Creek, in the west end of the county. Two veins have been opened up. The upper one shows 2½ ft. of good, free milling quartz. The pay streak in the other is much wider.

Iron Mountain Mining Company.—This company has closed its mill for the present. The main shaft is to be retimbered and sunk 200 ft. below the 1,900 ft. level. Ore shipments will probably not be resumed until June or July.

White Cloud Mine.—This mine is being worked by 14 men, under the management of Superintendent J. W. Hamilton.

Park County.

Mountain Mining and Milling Company.—This company is only running 5 to 10 stamps of their mill at Crevasse owing to the scarcity of water. This will be obviated next season by construction of a ditch about four miles in length to Knowles' Creek at a cost of $25,000. The Crevasse Company does no custom work. A large quantity of ore is awaiting treatment, and a custom mill would be a good investment.

Silver Bow County.

Notices of the following mineral locations were filed for record on March 17th:

Butte placer, three-fourths of a mile south of the Parrot smelter, by C. E. Pierce.

Golden Reef placer, one half mile south of the Parrot smelter, by Harry Zimmerman.

Bell placer, one mile south of the Parrot smelter, by D. L. Gibson.

Kathleen lode claim, six miles south of Butte, in Leslie gulch, by John L. Leslie, Richard Thierman, F. G. Gimund and A. H. Black.

Wisconsin placer, three-fourths of a mile south of the Parrot smelter, by J. C. Knox.

Gagnon.—This mine will be 1,200 ft. deep when the additional 100 ft., which have just been started, are finished. A new air compressor has just been erected, and in a short time machine drills will be in use.

NEVADA.

During the month of February the Eureka & Palisade Railroad Company received in transit to Salt Lake and Vallejo Junction, Cal., 820 tons of ore from Eureka district mines, as follows: From the Diamond mine, 531 tons; Eureka Consolidated, 140 tons; Jackson, 76 tons; Richmond, 40 tons; Hamburg, 23 tons, and Whittenberg, 10 tons. From Reveille, Nye county, 3¼ tons of high-grade ore.

Storey County—Comstock Lode.

Chollar Mining Company.—Therewere 96,996 shares represented at this company's meeting on March 21st, out of a total of 112,000 shares. The old board was re-elected as follows; A. K. P. Harmon (president), Thomas Cole, Thomas Anderson, E. P. Barrett and D. C. Bates. Charles E. Elliott was continued as secretary and H. M. Gorham as superintendent. The report of the latter showed 1,588 tons ore reduced during the year, yielding $25,174 gross, on which was realized $16,602 in gold coin, the difference representing the discount on silver. The secretary reported an overdraft of $11,983. To meet this deficit and to provide funds for future operations, the directors immediately levied an assessment of 20c. per share. This will realize $22,400. The previous assessment of 10c. per share became delinquent in January. Of late years the work has been mainly carried on through this assessment shaft.

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

Belcher Mining Company.—On the 850 level the north drift has been cleaned out and retimbered a distance of 25 ft., making its total length 245 ft. from the shaft. Twenty-eight tons of fair-grade ore have been hoisted during the week.

Crown Point Mining Company.—The west cross cut from the 600 level south drift was extended to a total distance of 15 ft., when it reached the hanging wall and was stopped. The west crosscut from the 7th floor of the 700-ft. level raise is now out 19 ft. The face is in low-grade quartz. We are still saving a few tons of low-grade ore per week from the 300-ft. level stope.

Savage Mining Company.—On the 1,050 level the east crosscut from the southeast drift started at a point 170 ft. from the station was advanced to a total length of 95 ft.; face in porphyry. The west crosscut from the southeast drift started at a point 225 ft. from the shaft was advanced 10 ft., total length, 20 ft.; face is in quartz giving some fair assays. On the 1,100 level the west crosscut from the north drift started at a point 132 ft. north of the station was advanced to a total length of 207 ft.; face in porphyry. In the north drift 132 ft. from the shaft and opposite the west crosscut we have started an east crosscut and advanced 21 ft.; face is in quartz and porphyry. The east crosscut started at the end of the south drift from the 12th floor was advanced to a total length of 27 ft.; face continues in quartz giving some fair assays. In the north drift from the 16th floor at a point 40 ft. north of the stopes we have started an east crosscut and advanced same 12 ft.; face is in quartz of low grade. On the 18th floor they continue to extract some ore of fair grade. They have hoisted 105 cars of ore from the 1,050 and 1,100 levels. Car samples average $20.

Segregated Belcher & Midas Mining Company.—The east crosscut from the foot of the raise on the 1,150 level was advanced to a total length of 33 ft. and stopped. During the past week we crossed two small streaks of low grade ore. Started to work on the 1,100 level in the north drift from the top of the 1,200 level vertical raise. It is now over 27 ft. The face is a mixture of clay and quartz. Continue to save a few tons of fair-grade ore from the 1,150 level south raise.

West Consolidated Virginia & California Mining Company.—We have cut through a clay wall 3 ft. thick in the west crosscut on the 1,100 level of the Consolidated California & Virginia mine, and have passed into a formation composed of porphyry and streaks of low-grade quartz ½ in. wide, with a considerable flow of water.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines and milled, with the average car and battery sample assay values, bullion, shipments, etc.:

Mines.	Ore H'st'd	Car S'mple Assay.	Ore Mil'd	Av. Bat'ry Assay.	Bullion for Week.	Total.
Belcher	28[1]	.....	.....	.....	.....	.....
Con. Cal. & Va.	25	35·85	43	34·33	.....	$1,720
Chollar	.....	.....	95	.....	.....	[2]314 lb.
Crown Pt.	[3]	.....	.....	.....	.....	.....
Occidental.	8	40	.....	.....	.....	.....
Savage	[4]105	20	.....	.....	.....	.....
Seg. Belchr	[5]	.....	.....	.....	.....	.....

[1] Fair grade ore.
[2] Crude bullion.
[3] A few tons being saved from the 300 level stope.
[4] Cars of ore.
[5] A few tons saved from the 1150 level.

Hale & Norcross Silver Mining Company.—The prolonged legal battle between M. W. Fox, the officers of this corporation and others, has closed. The appeal of the defendants in the suit from Judge Hibbard's decision, which ordered that the defendants refund to the stockholders $1,011,835, has been before the Supreme Court and has been submitted for final decision. For two entire days the 50 to 60 volumes of printed matter filed in the case were reinforced by arguments.

W. F. Herrin, as was pointed out by the "Engineering and Mining Journal" at the time he became identified with the suit, attained local fame during the trial of the Sharon case. Attorney-General Hart was for a long time himself identified with the Hale & Norcross Company, and so could argue very feelingly regarding the various acts of the defendants. Herrin & Wood appeared for Alvinza Hayward and the Nevada Mill and Mining Company. Garber represented the estate of the late W. S. Hobart. Taylor spoke for C. S. Wheeler, one of the directors of the company; Estee appeared for J. Law and Major C. P. Eagan, two other directors, and the Attorney-General for the company as such. Against this formidable battery, W. T. Baggett and L. D. McKissick charged on behalf of the plaintiff. Chief Justice Beatty, with Justices McFarland and DeHaven heard the case.

W. S. Wood opened for the appellants and read for nearly two hours, giving a variety of reasons, all purely technical, why the decision of the lower court should be overruled. Then M. M. Estee raised jurisdictional questions for about an hour, none of which appeared to strike the court very forcibly. E. R. Taylor was accorded 30 minutes to speak and took an hour, during which he tried to show how great a wrong had been done his client, who was merely negligent and not willfully corrupt. W. T. Baggett, in taking up the cudgels in defense of the Hebbard decision and judgment, briefly referred to Wheeler's position and the necessity for holding him liable, and then summarily dismissed Estee's contention regarding jurisdiction and Fox's continuous ownership of stock, and then reveiwed the record of the case from the stockholders' point of view. Summarized briefly, he stated how in 1886 a great ore body was found in the Hale & Norcross mine. The company with $11,000,000 or $12,000,000 had no mill, but near the mine was the Nevada mill owned by Hayward, Hobart, J. P. Jones, S. Jones, Evan Williams and A. C. Hamilton.

The mill people moved to get control of the mine; found President H. M. Levy in the way; bribed him with one-eighth of the net proceeds of Hale & Norcross ore; did obtain control of the mine for the benefit of the mill "ring" and elected directors. More than $3,500,000 worth of ore was taken out. The 30,000 shares in the mine held by the "ring" were then dumped on a boom market, save 1,105, and its members proceeded to mill the ore. Out of the $3,500,000 worth of ore extracted the stockholders received but $65,000—or 65c. per ton on ore averaging $39.43 per ton by assay. J. W. Mackay testified that $14 per ton would pay all expenses of mining and milling, yet every ton of Hale & Norcross ore of less value then $36.50 was worked by appellants at a loss. This, briefly stated, was the story as reviewed by Attorney Baggett, and upon the conclusion of his argument ex-Judge McKissick followed on the legal aspect of the plaintiff's contention. Then John Garber in less than an hour stated the points of law upon which his clients relied to have the judgment overthrown. He contended that aside from the agreement with Levy, which they had not personally made and denied knowledge of, but which they had carried out, Hayward & Hobart had been guilty of no wrongdoing. But for the Levy incident the contract between the mine and the mill was entirely innocent. He read law and quoted authorities, and having massed the salient features of the case tending to overturn the decision of the lower court he subsided. W. S. Wood followed and argued for 40 minutes in closing the main appeals, and then Attorney-General Hart spoke on the appeal of the mining company against the order appointing a receiver and awarding counsel fees. Great interest has been manifested in this suit, not only by mining men, but, to a large extent, by the general public. Opinion as to the ruling of the Supreme Court is being freely ventilated just now, but such speculation is really not worth much.

White Pine County.

Chainman.—It is reported that this group of mines, consisting of the Southern Cross, Chainman, Chainman Gore, Turkey and V, have been bonded to W. B. Graham for $350,000.

Yuba.—This mine has closed down, throwing many men out of employment.

NEW HAMPSHIRE.

Hillsborough County.

The granite of Nutford is said to be so nearly identical with that of the Westerly, R. I., quarries that only an expert can tell them apart. Thousands of tons are shipped every year to New York, Philadelphia and Boston. The supply is practically inexhaustible.

NEW JERSEY.

Morris County.

Teabo Iron Mine.—The Glendon Iron Company states that it has no present intention of commencing operations in its Teabo mines, as had been reported.

NEW MEXICO.

Sierra County.

The output of Hillsboro gold mines for the week ending March 15th, as reported for the "Advocate" were: from the Standard Gold Mining and Milling Company, Snake Mine, 35 tons; Opportunity Mine, 240 tons. From the Good-Hope Bonanza Mining and Milling Co.: Bonanza Mine, 110 tons; Percha, 138 tons. From the Garfield, Morton and Bull of the Woods, 110 tons. Total, 633 tons. Total output since January 1, 1894, 6,668 tons.

The output of Hillsboro gold mines for the week ending March 22d, as reported for "The Advocate," was: Standard Gold Mining and Milling Company: Snake mine, 40 tons; Opportunity mine, 235 tons. The Good-Hope Bonanza Mining and Milling Company: Bonanza Mine, 115 tons; Percha, 140 tons. Garfield, Morton and Bull of the Woods, 105 tons. Total, 625 tons. Total output since January 1st, 1894, 7,293 tons.

Hillsborough.—In speaking of deep mining in the camp the Hillsborough "Advocate" says: The Opportunity shaft last week was sunk to a depth of 500 ft. Recently the Bonanza tunnel was completed to the vein and the drift therefrom started, which within a short distance will gain a vertical depth of 620 ft. At the Inter-Republic tunnel work has been resumed under contract to complete the tunnel to the Sailor Boy vein at a depth of over 600 ft. The Richmond shaft is so located on the side of the mountain that the depth south from the bottom of the 500-ft. shaft will eventually gain a vertical depth of over 1,000 ft. A drift has been carried in the past few months some 800 ft. north from the Snake shaft on the 350-ft. level to connect with the workings of the Bobtail mine, opening for stoping a large area of rich territory. As soon as the 500-ft. station of the Opportunity is complete the shaft will be continued another lift of 100 ft. In the Bonanza, Snake, Richmond, Bobtail and Opportunity mines large reserves have been opened and thus a regular and increasing output is assured.

NORTH CAROLINA.

Moore County.

Columbia Mining Company.—This company, which has its offices in Washington, and of which Dr. A. C. Patterson is secretary and treasurer, during the past four months has been operating two improved Crawford mills at their gold mine near Carthage. An immense ore body has been developed, and while the ore is low-grade, yet this mine promises to become one of the largest in the South. The cost of mining is said to be little more than that of quarrying. Over 1,000 tons have already been treated by the two mills in question, and the average amount cleaned up has been about 84% of the assay, exclusive of a quantity of rich concentrates. The ore is comparatively free-milling, though, owing to the presence of sulphurets, not more than 50% of the value has been saved by stamps. The capacity of the Crawford mill on this ore is over 10 tons per 24 hours, and so gratifying have been the results obtained, that three more Crawford mills have been ordered by the company, and before the end of April a complete plant of five mills, with a capacity of about 52 tons daily, will be in operation at this mine. Mr. Alfred A. Watson, of Carter's Mills, Moore County, is manager of the mine. While miners have admitted, as a rule, that

the principle of the Crawford mill is correct, yet some have contended that the cost of the wear and tear must always be excessive. It is claimed that proof to the contrary is afforded at this mine, where the cost of wear and tear on the treatment of 1,000 tons is shown to be only 20 cents per ton. Several other mines in the neighborhood, at present at a standstill, are considering the advisability of adopting the Crawford mill in consequence of the results at the Columbia.

Randolph County.

Branson.—This gold property has been purchased by some Ohio parties, and will be capitalized for $60,000 and incorporated as the Buckeye Gold Mining Company.

NORTH DAKOTA.

Richland County.

Coal, said to be similar to that worked at San Coulee, Mont., has been found at Colfax, 21 miles from Wahpeton, on the Great Northern Railroad line. A shaft will be sunk to the seam as soon as spring comes.

OHIO.

On March 21st, Chairman Blanchard of the Central Traffic Association, as arbitrator, ruled in favor of the Ohio coal roads, allowing a differential of 2½c. as between Ohio and Pittsburg and in increasing the differential between Pittsburg and West Virginia 2½c., giving Ohio an increased differential of 5c. over last year's basis. Thus the matter of coal rates, after a prolonged discussion, seems to have been settled.

Some large purchases of coal land have recently been made in the vicinity of Steubenville, in Jefferson and Harrison counties, through the firm of J. C. Bishop & Co., of that city. The vein block bought was 2,500 acres near Steubenville, while other purchases include 1,200 acres at Hopedale and 2,800 acres near Cadiz. The price paid is said to have averaged about $33.33 an acre. No announcement has been made of the parties who are backing this purchase.

OREGON.

Crook County.

A 3-ft. seam of coal has been discovered at Bridge Creek on the land of Mrs. M. E. Carroll. Samples taken at a depth of 50 ft. have shown the coal to be of good quality.

San Benito County.

A vein of good coal, averaging 6 ft. in thickness, is reported as discovered.

PENNSYLVANIA.

Pennsylvania Railroad Company.—The annual election of this company was held in Philadelphia on March 27th. The following directors were elected: George B. Roberts, Alexander M. Fox, Alexander Biddle, N. Parker Shortridge, Henry D. Welsh, William L. Elkins, H. H. Houston, A. J. Cassatt, C. A. Griscom, B. B. Comegys, Amos R. Little, W. H. Barnes and George Wood.

Anthracite Coal.

A press dispatch from Pine Grove states that for the first time in about eight years have the Williamstown, Lykens and Bear Ridge collieries been forced into idleness by a scarcity of orders. About 3,500 men and boys are thrown out of employment. The West Brookside and Lincoln collieries, which have also worked regularly for about five years, are now working only three days a week. About 2,000 men and boys are affected.

Philadelphia & Reading Coal and Iron Company.—Mr. J. S. Harris, president of this company, has written the following letter in answer to questions propounded to him: The only careful and thorough estimate ever made of the probable amount of coal in the Reading Company's land, which estimate was made by their own engineers in 1880, estimates that they contain between 33 and 34% of the total anthracite tonnage in Pennsylvania. In 1887 the Reading Company did send nearly one-third of the anthracite to market, but the year before it sent less than 27% and the year after it sent about 29%, so that 1887 cannot be taken as a fair test of the relative productiveness of the Reading properties at that time. The table below shows the average amount of coal carried by the Reading and of that sent from the whole anthracite region for the years named:

	Average Reading tons.	Average total anthracite tons.	Per-centage.
1869-73.....	5,050,796	17,333,164	29
1874-78.....	5,447,398	19,394,631	28
1879-83.....	6,947,459	27,750,746	25
1884-88.....	6,999,305	33,479,358	21
1890-93.....	8,246,733	39,557,405	21

Thus, on the whole, the Reading tonnage is gaining, though not in the same proportion as the total, it having increased 63% in 20 years, while the total anthracite production has increased 128%. This is due, not, as is so frequently urged, to unfaithfulness on the part of the persons who are managing the Reading properties, but to a variety of causes. As a rule, the coal lies much deeper in the Reading's territory than in the other coal fields, is more difficult and more expensive to mine, is associated with more slate and other refuse which require to be separated from it, and the mines require much more pumping and much more timber to keep the passages open. All of these reasons handicap the Reading, because they make its coal more expensive, and the advantage of late years has been with the northern Companies whose coal was more cheaply mined and whose colliery openings were more cheaply made. The Reading has also been handicaped by its enormous debt, so that it would have been foolish at any time for it to have gone into the market to mine coal regardless of the price at which it must be sold, and this price could not have been maintained without very conservative and careful handling on the part of the Reading company. The Reading company does control most of the Lykens Valley coal and most of the Schuylkill red ash, but there is not a great deal of the latter. The Reading's facilities for mining and transporting coal are fairly abreast of its present output, but not much in excess of that. The cost would be ruinous if we were to attempt to open mines in advance of our ability to market coal. Every effort will be made to develop and extend our business, and it is but fair to say, in regard to former managements of the company, that every one for the past 20 years has done the same thing. When you consider that it takes an expenditure of about $2,000,000 and two or three years' time to get ready to produce 1,000,000 tons of coal annually, you will see that it is not the easy thing that the newspapers generally assume it to be to rapidly increase the production.

Bituminous Coal.

About 200 miners at Spangler, who had been on a strike for 10 weeks, resumed work this week at a reduction of 10%.

The thousand miners who have been on a strike at Patton for 8 weeks resumed work on March 26th, at 5c. a ton reduction. The mines have a large amount of orders to fill and will keep busy all summer.

Iron.

(From our Special Correspondent.)

Cornwall Mines, Lebanon County.—Work is being prosecuted on a very reduced scale, only about one-fourth the usual number of hands being employed. One gang is mining on Big Hill, on the east side of the large dike of ore on which the railway crosses the pit. Three gangs are employed in the cuts on Middle Hill and one on Grassy Hill. The local furnaces are mostly out of blast, but rumors of early blowings in are prevalent. These ore banks have produced a total of over 12,000,000 tons of ore and are good for many years to come.

Nickel.

(From our Special Correspondent.)

Gap Mine, Lancaster County.—This historic mine is being dismantled and may never resume. The pumps were stopped some weeks ago and now the water has risen to within 50 ft. of the surface and will come still higher. The shafts only penetrated to 250 ft. as a maximum and it is by no means certain that all the ore has been won. The geological relations are very similar to those of many Norwegian deposits of pyrrhotite, for the ore is chiefly found along the outer edges or contacts of an intruded mass of gabbro with mica schists.

Oil.

Producers' & Refiners' Oil Company, Limited.—Arguments were commenced at Meadville, on March 27th, before Judge Henderson, in a suit brought by Col. John J. Carter to restrain the Producers' & Refiners' Oil Company, Limited, from selling its property to the United Pipe Lines Company. The plaintiff is a stockholder in the Producers' Oil Company, which owns 170,000 of the 250,000 stock of the Producers' & Refiners' Oil Company, and organized to collect oil in the Allegheny oil field for transmission through the pipe lines of the latter to the Oil City and Titusville markets. The plaintiff avers that the sale of these pipe lines by the latter company would practically destroy the business of the former. As the two companies were organized to work in connection with each other the plaintiff asks that they be restrained from selling, as is contemplated.

Salt Lick Gas and Oil Company.—This company has been formed at Snow Shoe. The officers are: President, J. H. Holt: vice-president, Samuel Christ; secretary and treasurer, M. Fredericks; directors, J. W. Smith, Samuel Christ, W. E. Ritter, W. W. Betts, M. K. Kulps, T. B. Budinger, J. H. Holt, Ira C. McCloskey and C. M. Bower. Three wells to the depth of 2,500 ft. will be sunk along the Susquehanna River, near Salt Lick, in Clearfield County.

TENNESSEE.

Bradley County.

(From our Special Correspondent.)

Blue Springs Mining Company.—This company, at Blue Springs, has recently put in operation its new concentrating plant and furnace, but as yet has not succeeded in getting satisfactory results therefrom. However, with a week or two of experience it is expected that everything will be running nicely.

TEXAS.

Harris County.

It is reported that coal has been found near Houston, Texas, and the land containing it purchased by the Southern Pacific Railroad Company.

McCullough County.

Mr. J. F. Chaffin, writing from Waldrip, states that numerous test pits which have been made in that vicinity show an extensive body of bituminous coal. At one place a small mine is being worked and the coal used at Coleman, where it has given excellent results. It is understood that the Southern Pacific Railroad is investigating these coalfields and, if found satisfactory, may interest itself in constructing a line connecting them with the extensive iron ore deposits at Llano.

UTAH.

Salt Lake County.

The shipments of ore and bullion from Salt Lake City during the week ending March 17th, were as follows: Bullion, 649,508 lbs.; copper matte, 163,085 lbs.; silver and lead ores, 1,907,190 lbs.

The receipts of ore and bullion at Salt Lake City for the week ending March 21st were to the aggregate value of $117,542, of which $86,492 was in bullion and $31,050 was in ore. The receipts of Pennsylvania bullion amounted to $11,589; Hanauer bullion, $5,850; base bullion, $22,900; Ontario bullion, $13,967; Daly bullion, $10,936; gold bullion, $2,250; cyanides, $19,000. Ore receipts were $19,050 by McCornick & Co., and $12,000 by T. R. Jones & Co.

Utah County.

Regarding the gold find that made such an excitement at Lehi last week the "Banner" says: The claims which caused the excitement are only two miles west of Jordan River, and are within 50 yards of the Salt Lake & Western Railroad. The ore has been tested and found to be adapted to the cynide process. It is a pink slate or talc.

VIRGINIA.

It is reported that the Sulphur Mines Company, of Virginia; the Atlantic & Virginia Fertilizer Company, of Richmond, and the Monumental Chemical Company, of Baltimore, Md., have consolidated and will be known as the Sulphur Mines Company. The combined capacity of these companies is given as 22,000 tons of sulphuric acid per annum.

Louisa County.

Two valuable veins of gold-bearing quartz assaying on the surface from $9 to $12.50 per ton, have been discovered in this county, according to a late dispatch. It is said that New York capitalists, who own the property, have organized a syndicate to buy up all the adjoining land.

WASHINGTON.

Another step was taken on March 17th in the case of the State of Washington against John G. McBride of that State, which is one of the most important case ever before the general land office. The controvery arose over an application for a patent for a mineral placer claim. There are six locations, each covering 20 acres, on the claims made by the right of discovery in September, 1889, by M. Topliff, G. P. Topliff, Reed O. McLean, F. T. Crowe, H. R. Laplain and H. O. Geiger, who subsequently sold the claims to McBride. The attorney general of the State filed a protest against the application, alleging that all sections of the land of which entry is sought is State property; that the land contained no valuable mineral deposits, but was wanted as city property, as it joins Tacoma. McBride asserted that gold existed in paying quantities, entitling him to the property. Secretary of the Interior Smith now decides that a hearing is necessary to determine the value and extent of the alleged deposits and orders a thorough prospecting of the land, and a special agent of the department will be present at this investigation. The case has been made a special to secure an early settlement.

WEST VIRGINIA.

McDowell County.

The lower end of the Flat Top coalfield has been rapidly developed owing to the pushing forward of the Elkhorn division of the Norfolk & Western Railroad, and during the last two years a large inflow of capital has come into the field. The shipments during 1893 were 2,722,433 tons of coal and 454,656 tons of coke. The seams average from 6 ft. to 6 ft. 6 in. in thickness and the coal is harder and yields a larger percentage of lump coal than that of the upper Elkhorn. The companies lease the coal at a royalty of 10 cents per ton and sell it to the Pocahontas Coal Company. The miners receive 37½ cents per ton, run of mine. The mines are just now running half time. The principal companies operating are: The Empire Coal and Coke Company at Landgraff, where there are 100 Welsh coke ovens operated with machinery; the Peerless Coal and Coke Company, 154 beehive ovens; the Bottom Creek Coal and Coke Company, 100 beehive ovens; the Tide-Water Coal and Coke Company, 100 beehive ovens.

Mercer County.

A party of surveyors who recently went out from Bluefield, under protection of deputy United States marshals, to survey coal lands has returned. It was impossible to obtain provisions and lodgings, and the surveyors were actually starved out of the district.

WISCONSIN.

Iron—Gogebic Range.

Iron Belt.—This mine has started work, paying its miners $1.10 per day. Surfacemen receive from 75c. to 90c. per day.

WYOMING.

Albany County.

Le Garde Placers.—These placers are still attracting attention, and many claims are being staked off daily; no less than 300 have already been staked.

Fremont County.

Mary Ellen.—This mine still continues in good ore; the mill which is full of ore will commerce to run as soon as there is sufficient water in Rock Creek.

FOREIGN MINING NEWS.

AUSTRO-HUNGARY.

Imports and exports of coal and coke for January are reported by the "Kohlen Zeitung" as follows:

	Imports. Tons.	Exports. Tons.
Coal	371,698	55,205
Brown coal (lignite)	889	480,285
Coke	27,969	10,908

The chief exports of coal were to Italy and Roumania; of lignite to Germany and Italy.

BELGIUM.

The total production of pig iron in February was 65,800 metric tons, showing an increase over February, 1893, of 5,020 tons, or 8.4%. A general improvement in demand is reported.

BRITISH COLUMBIA.

Canadian Northwestern Mining Company.—This company has been organized with a capital stock of $2,000,000, in shares of $5 each. The incorporators are W. L. Steele, A. T. Vohldrup and C. P. Connolly, of Helena, Mont. Operations are to be carried on in British Columbia, and the office is to be at Helena, Mont.

(From our Special Correspondent.)

Several amendments to the Mineral Act are now before the provincial legislature. The chief amendment will affect the location of claims. In future claims will be marked by three posts, a discovery post on the outcrop, and Nos. 1 and 2 posts, which are to be placed on the strike of the vein as near as possible, and a blazed line is to be cut between them. No. 1 post is also to be marked with the words "Initial Post," and the approximate compass bearing of No. 2; distance from 1 to 2 (not to exceed 1,500 ft.) and the number of feet which lie to the right or left, or right and left of the location line.

It is also provided that in future the cost of surveying shall not be included as an improvement when the certificate for $500 worth of improvements is applied for.

Britomarte Claim.—The Mining Commissioner has raised an interesting point in mining law. He has refused to grant a certificate for a crown grant to Capt. R.C. Adams for this claim. The claim is located over a perpendicular cliff on which the veins is exposed but inaccessible. The owners who also own an adjoining claim, the Chamblet, started a tunnel on that claim for the purpose of reaching the Britomarte veins, and also started a second tunnel on the Chamblet veins, the total work representing some $1,500 assessment. On the strength of this he applied for a certificate of improvements for the purpose of obtaining a crown grant. The gold commissioner refused the certificate under clause A, Section 36 of the Mineral Act, which provided that such a certificate must be granted for having "done or caused to be done work on the claim itself in developing the mine, to the value of $500, exclusive of all houses, buildings, or like improvements." Capt. Adams' representatives rest their case on Section 33 of the Mineral Act, which provides "any money or labor expended in constructing a tunnel to develop a vein or lode shall be deemed to have been expended upon such vein or lode." The case will be carried to the courts this spring for settlement.

GREAT BRITAIN.

The total coal and coke exports in February were were 2,389,915 tons, against 1,914,401 tons for the month last year, and 2,076,585 tons in 1892.

HUNGARY.

The coal production of Hungary for the year 1893 is reported at 3,600,000 metric tons. The imports of coal for the year were 1,028,731 tons, of which 302,767 tons were from Germany.

INDIA.

Ceylon.

The graphite industry in Ceylon is at pressnt in a somewhat depressed state. Prices are very low and operations at several mines have had to be suspended. The exports during the last quarter of 1893 only amounted to 57,163 cwt., as against 70,944 cwt. in the preceding quarter.

SOUTH AFRICA.

Transvaal.

The gold output of the Witwatersrand mines for February was 151,870 oz., against 149,314 oz. in January, and 93,252 oz. in February, 1894. For the two months to February 28th, the output has been 301,184 oz., against 201,626 oz. for the corresponding period in 1892. In February, 1893, the output was reduced by an exceptionally heavy rainfall and damage to some of the mines.

It is reported that the Forbes Reef Company has made some new discoveries of tin on its concession as far as the Komatie River.

SPAIN.

The total exports of iron ore in 1893 were 4,646,877 tons, a decrease of 152,770 tons from 1892. The exports of copper ore for 1893 were 174,934 tons, showing an enormous decrease from 1892, when 511,115 tons were reported. The zinc ore exports were 30,814 tons last year, against 39,574 in 1892. The exports of lead also show a decrease, having been 12,048 tons in 1893 and 13,717 tons in 1892.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, March 30.

Statement of shipments of anthracite coal (approximated) for week ending March 24th, 1894, compared with the corresponding period last year:

	1894. Tons.	1893. Tons.	Difference.
Wyoming region	273,138	496,054	Dec. 222,916
Lehigh region	91,367	146,242	Dec. 54,875
Schuylkill region	162,865	250,190	Dec. 87,325
Totals	527,370	892,486	Dec. 365,116
Total for year to date	6,885,195	9,192,908	Dec. 2,307,713

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending March 24th and year from January 1st:

	1894. Week.	1894. Year.	1893. Year.
Shipped East and North:			
Phila. & Erie R. R.	393	13,167	33,694
Cumberland, Md.	54,422	674,695	821,018
Barclay, Pa.	478	5,684	17,949
Broad Top, Pa.	8,721	87,741	194,587
Clearfield, Pa.	69,744	781,794	955,793
Allegheny, Pa.	24,642	319,563	291,332
Beech Creek, Pa.	42,721	568,036	470,912
Pocahontas Flat Top	50,273	583,392	611,833
Kanawha, W. Va.	46,361	564,365	759,509
Totals	297,695	3,598,437	4,156,627

	1894. Week.	1894. Year.	1893 Year.
Shipped West:			
Pittsburg, Pa.	22,571	303,812	3 6,794
Westmoreland, Pa.	24,469	335,212	486,755
Monongahela, Pa.	7,798	105,143	174,687
Totals	54,838	744,167	968,236
Grand totals	352,533	4,342,604	5,124,863

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending March 24th, 1894, and year from January 1st, in tons of 2,000 lbs.: Week, 70,299 tons; year, 765,363 tons; to corresponding date in 1892, 1,334,888 tons.

Anthracite.

Trade conditions in the anthracite coal market have undergone no noteworthy change since our last report. The market continues quiet and dull, consumers showing little disposition to buy any coal just now.

A meeting of the freight agents of the anthracite roads was held in this city on Tuesday last and some important changes were made in the rates. The rate from the mines to Buffalo was reduced 25c. per ton and is now $2. Rates from mines to tidewater were fixed as follows: Lehigh Valley (as stated last week), 40% of tidewater prices, on all sizes; Delaware, Lackawanna & Western, a fixed rate of $1.45 on all sizes, to go into effect April 2d. The Pennsylvania's rate on the 40% basis is $1.51 on prepared sizes. The other roads have not yet announced their rates.

The anthracite sales agents met in the offices of Coxe Brothers & Co., in New York, on Thursday. The meeting lasted several hours, and a great deal of discussion took place. The result of it all was to fix April prices at $3.50 for grate and egg and $3.75 for stove and chestnut. Last year's prices were $3.90 for broken and egg and $4.15 for stove and chestnut. Buffalo prices were fixed at $4.15 for grate, $4.40 for egg, stove and chestnut. Western lake port prices named were, on cars, $5 for grate, $5.25 for egg, stove and nut; in yard, 15c. per ton higher. The policy of restriction is continued, the recommendation having been made to limit the April tonnage to 40% of the October shipments, which were 4,500,000 tons; this will make the April limit 1,800,000 tons.

That the sales agents acted wisely in taking these steps none can or will deny. The companies have simply given official sanction, as it were, to prices which have been made openly during the past fortnight. It is not likely that there will be much further "cutting" by some of the independent operators or by the companies. On the other hand, business will probably not be stimulated to any great extent by the "reduction," unless all indications are wrong; the market does not want any coal just now. If producers are to maintain prices the restriction must be adhered to strictly until trade conditions warrant a greater output.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending March 24th, was 185,000 tons, of which 20,000 tons were sent to Port Richmond and 18,000 tons were sent to New York waters.

NOTES OF THE WEEK.

The board of directors of the Delaware & Hudson Canal Company this week decided that the new issue of $5,000,000 of the company's stock shall be issued at par to the stockholders. The amount authorized is $5,000,000, to be used to retire the $4,829,000 of the company's bonds, which mature in October next. This will leave outstanding only $5,000,000 of bonds, maturing in 1917, and will increase the capital stock to $35,000,000. The company's charter permits the issue of stock to any amount which the stockholders may authorize.

The statement of the Philadelphia & Reading Coal and Iron Company for February shows gross receipts, $1,480,069; operating expenses and improvements, $1,586,476; loss from mining, $106,407. Fixed charges amounted to $108,320, making the total deficit $214,727. The gross earnings show a decrease of $438,901 from February, 1893, but the total deficit increased only $14,506. For the three months of the fiscal year to February 28th, the gross receipts were $5,343,761; operating expenses and improvements, $5,358,183; loss from mining, $14,421. Fixed charges were $324,961, making the total deficit $339,382, a decrease of $59,505 from the deficit reported for the corresponding period last year.

Bituminous.

The bituminous coal market is in a sluggish condition. A small business is doing by most of the producers, but everybody is feeling the severe competition which has entered into this market, especially of late. During the past few weeks consumers from east of the Cape have commenced to take coal again; had it not been for these orders the trade would have been in a very bad condition.

All soft coal producers are reducing first costs to a minimum and allied trades are feeling the effects of these efforts to a marked extent. Operators in the George's Creek region have reduced miner's wages 10c., from 50c. to 40c. In the Clearfield and Broad Top regions the rate has also been reduced to 40c.

The railroads have reduced their through rates from 10 to 25c. and coast wise vessel freights are going down and bid fair to reach the lowest figures ever known. Loading and discharging charges, as well as commissions to middlemen are being very carefully looked into, and it looks as if present prices were as low as could be expected.

Contracts are coming into the market slowly in New England and are being taken generally at very low figures. It looks as if contract season will drag along into May. Few, if any, contracts have been taken for points this side of the Cape.

An impression seems to prevail that there will be very little trade this year, owing to which there has been a scramble for orders without regard to price on the part of many bituminous coal men. We do not see anything which justifies such a belief. Business in the coal market will be in 1894 very nearly as large as usual, and all producers ought to get their share of it.

There is considerable coal on the way from the mines to tidewater, but the railroads are handling it very well and no blockade has resulted as yet, although there is a good deal of coal standing at the shipping ports. There is no delay in loading vessels. There is a surplus of cars which may be had for the asking. Prompt shippers continue to be the most favored in this matter.

All rail business is in a fair condition and is holding its own. Local trade to the shipping ports is slow. New York harbor trade is quiet.

Current rates of freight on coastwise vessels are as follows from Philadelphia: To Boston, Salem, Portland and Bath, 65@70c.; Providence, New Bedford and New Haven, 60c.; Portsmouth, 70c.; Wareham and Newburyport, 80c.; Lynn, 75@85c.; Saco, 90c. and towages; Dover, $1.15 and towages. From the lower ports rates are from 5c. to 10c. higher. The freight market is weak and vessels are in good supply and seeking orders.

The railroad rates on bituminous coal have been reduced 10c. a ton on shipments to Philadelphia, Baltimore and Newport News. To Jersey City and New York Harbor the reduction is 15c. a ton, and to Perth Amboy 20c. a ton. This reduction is to affect only shipments to competing points.

NOTES OF THE WEEK.

The case of the Berwind-White Coal Mining Company against the United States & Brazil Steam ship Company came up on appeal in the United States Court, in this city on March 28th, and was ordered to be submitted for instructions to the United States Supreme Court, as to a question growing out of the libelling of a British steamer, under the New York State laws.

Judge Acheson filed in the United States Circuit Court in Phildelphia, Pa., on March 26th, an opinion deciding preliminarily against the Pennsylvania Railroad Company in an alternative mandamus proceeding brought by R. B. Wigton & Sons, in which it was charged that the Pennsylvania Railroad Company discriminated in rates for the carrying of bituminous coal in favor of the Berwind-White Coal Mining Company.

The curious incident of miners reducing their own wages to get even with others who they think have been working too low and getting the latter's wages increased is reported from Coal Center, Pa. A special from that place to the Pittsburg "Dispatch," says: The miners at the Crescent mine, owned and operated by the California Coal Company, at California, went to work this morning at 1c. per bushel. This was not done at the request of the operators of the mine, but in a spirit of revenge against the miners at Brownsville, who have been working at 1¼c. or one-fourth below the established price. Brownsville working at 25c. per hundred less than the other pits in the pool has long been the bone of contention all along in the Fourth pool, and this would force them on the same terms to work for 75c. per hundred bushels, which it is not expected they will do, but that they will stand out for the price agreed upon some two weeks ago, of $1.50 per hundred. Miners can barely make a living at $1.50 per hundred, and what they would do at $1 can only be conjectured. The men at the Crescent and Vigilant mines, both owned and operated by the California Coal Company, are forced either to deal most of their earnings out of the company store at such prices as the managers exact or be discharged from their employment, notwithstanding the State

law against the same. The result of this was that the Brownsville mines posted notices that they will pay $1.50 a hundred. The California Coal Company will pay the same wages, so that things in the pool have at last been equalized.

Buffalo. March 29.

(From our Special Correspondent).

No incidents have been connected with the local trade in anthracite coal, except that four days of very cold weather has caused quite a good consumptive demand. Prices unchanged.

Bituminous coal is fairly active at nominally unvaried quotations. The demand for propellor use will begin in a few days, as the line boats will commence their trips on April 16th. No arrivals here by lake, but two sail vessels reached Erie from Toledo a few days since laden with grain.

Stealing coal from the cars on the railroad tracks continues, notwithstanding the punishment inflicted on culprits by fine and imprisonment. It appears that saloon keepers and grocerymen are the receivers of the stolen goods.

The Canal Bonding Bill for $12,000,000 has been approved by the Canal Committee of the Exchange, and the county representatives have been urged to secure its passage, if possible, through the New York State Legislature.

The Fitchburg Railroad bituminous coal traffic will be diverted from the Buffalo, Rochester & Pittsburg Railroad to the Erie Railroad on and after April 15th.

Vessel men have been offered 45c. per net ton for coal, from Cleveland to Chicago, Milwaukee and Sheboygan; and 40c. to Gladstone, Manitowoc and Escanaba. No charters have been made public.

The Welland (Canada) Canal opens April 19th. The Sault Ste. Marie Canal locks will be opened directly the ice leaves the river. It is positively asserted that vessels could pass through the Straits of Mackinaw as there is nothing to obstruct navigation but small fields of floating ice.

The coal shovelers of Superior, Wis., and Duluth, Minn., have organized a union to fight an anticipated reduction of wages from 50c. to 40c. per hour at opening of navigation. Over 500,000 tons of coal are now on the docks at Superior and Duluth.

At a joint meeting of trunk line freight and coal sales agents yesterday a resolution was adopted providing that after April 1st coal freights from the mines to Buffalo shall be $2 instead of $2.25 per ton.

Chicago. March 28.

(From our Special Correspondent.)

Up to the 20th, March weather was springlike, but since that date we have had the themometer down as low as 10 deg. and almost a half foot of snow. It is yet too early to tell whether the coal market at Chicago has been benefited by the cold wave, but present outlook does not indicate that it will be. The market for the week past has been one of poor business. Spring prices are now being talked of, and possibly coal may be had for a very low price, if some predictions are anywhere near being accurate.

Anthracite prices are: Egg, range and chestnut, $5.75. Retail prices being: Egg, range and chestnut, $6.75@$7.00.

Bituminous.—Bituminous coal has shown no increase in tonnage for the seven days. This is curious from the fact that we hear of many large manufacturers resuming business, and which naturally ought to consume a large amount of coal. The strikes in the different States undoubtedly have affected the markets considerably, from the fact that nothing is yet known relative to the wages of the miners. When a settlement has been reached conditions may improve much. Quotations are per ton of 2,000 lbs. f.o.b. Chicago: Youghiogheny, $3.00; Pittsburg, $3.25; Hocking Valley, $2.80; Brazil block, $2.70; Raymond, $3.65; Shawnee, $2.80; Cumberland smithing, $3; Mt. Olivet, $2. Cannel coal quotations are: Pinkney, $4; Birdeye, $5; Kentucky, $5.

Coke continues to have but limited attention, the sales being few and for small quantities. Prices are: Connellsville crushed, $4.00; furnace, $3.90; Ellsworth, $3.75.

Pittsburg. March 29.

(From our Special Correspondent.)

Coal.—A further rise in our rivers has enabled coal men to forward more coal to the lower markets. Shipments comprise 24 towboats, whose tows aggregate 128 coalboats, 177 barges and 6 fuel-flats, containing 5,315,000 bushels. This coal is designed for the Southern and Western markets; prices continue very low. A Charleston dispatch says that all the miners in the Kanawha Valley resumed work; about 5,000 men are now employed. At Johnstown, Pa., 1,000 miners, who have been on a strike at Patton for eight weeks, resumed work at 5c. a ton reduction. The mines have a large amount of orders to fill and will be kept busy all summer.

Connellsville Coke.—The prospect now is favorable for a big strike in the coke region, beginning Monday, April 2d; the miners claim they are all organized. At the Scottdale meeting they arranged a uniform scale for coke workers and miners; not a single operator put in an appearance and no conference was held; 18 representative miners were present. The report of the Scale Committee was heard and the scale formulated and adopted. The scale calls for a rate of 90c. for mining room coal and 48c. for drawing coke; this is an advance on the Frick sliding scale of 12c. on mining coal and 5c. on drawing coke. The Frick scale was used as a basis for all other rates with the uniform advance of 12½%. The new scale has no sliding features. A strike has been ordered according to the latest dispatches.

A notable decrease in both demand and shipment is reported. The operators are apprehensive of a strike. It cannot be all attributed to the threatened strike, however, for last week's shipments had reached their destination before the threat was made, so that the falling off must in part be due to an overstock of coke in furnace yards. For several months past there has been a steady increase, and it was hoped that the condition would continue until an advance in the selling price could be made.

The total output for the week fell off 3,619 tons, and the shipments 2,155 tons. The production in excess of the actual demand was 4,336 tons, and the coke is in cars or stacked in yards. The operators think the trade will remain stationary, but if the strike is made they say the trade recently captured from West Virginia will return to that State, and no matter what the result of the strike may be, the trade in the Connellsville region will be ruined for a long time.

IRON MARKET REVIEW.

New York, Friday Evening, March 30, 1894.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending Mar. 31.1893. F'ces.	Tons.	Week ending Mar. 30. 1894. F'ces.	Tons.	From Jan., '93. Tons.	From Jan.,'94. Tons.
Anthracite.	74	34.010	32	16,902	426 557	194,184
Coke.....	145	134,320	84	91,507	1,727,602	1,122,731
Charcoal...	35	8,155	18	4,098	122,645	51,178
Totals....	254	176,485	134	112,507	2,276,804	1,368,093

Pig Iron.—Our reports from the various iron centers show that the improvement in our last week's review of the market continues In New York and vicinity there has been no change worthy of mention; business continues quiet, with prices practically as last quoted. There is rather more inclination on the part of consumers to come into the market for larger orders than they have been giving. This does not mean that actual business is very active, but rather shows that the market is resuming normal conditions and the prospects for the future are growing brighter every day. Prices, if anything, are slightly weaker, and though they are not likely to go much lower, the chances of an advance are remote. Quotations are nominally as follows: Northern brands: No.1, $13@$14; No. 2, $12@13: gray forge, $11 50@12. For Southern iron we quote: No. 1, $12.50@$13.50; No. 2, F., $11.50@$12.50; No. 1 soft F., $12; all at tidewater. Scotch irons are quoted: Coltness, $21.50@$22; Eglinton, $19.50@$20; Summerlee, $20.50@$21.

Billets and Rods.—Advices from other centers indicate that prices are firmer. This market is quiet. Quotations are nominally: Domestic billets, $17.25@$18; wire rods, domestic, $27@$27.50; foreign rods, $39@$40.

Manufactured Iron and Steel.—A few small orders and a fair-sized one have been placed this week. On the whole, the market has been quiet, with prices unchanged from last week. Quotations are nominally as follows: has been done in manufactured iron and steel this week, but prices continue low and more or less unsettled for some forms. We quote nominally: Angles, 1·30@1·50c.; axles, scrap, 1·40@1·60c. delivered; steel, 1·40@1·55c.; bars, common, 1·20@1·30c.; refined, 1·40@2c. on dock; beams, up to 15 in., 1·35@1·50c; channels, 1·40@1·60c. on dock; steel hoops, 1·50@1·75c., delivered; links and pins, 1·50@1·75c.; plates, flange, 1·60c.@1.80c.: fire-box, 1·80@2·10c.; flange, 1·60@2c.; marine, 2·45@2·70c.; sheared, 1·80c.; shell, 1·40@1·60c.; tank, 1·25@1·35c.; universal mill, 1·20@1·50c.; tees, 1·50@1·65c., all on dock.

Merchant Steel.—A fair business is reported in merchant steel this week. Prices are unchanged. We quote: Tool steel, 5·75@6·25c.; tire steel, 1·75@1·80c.; toe calk, 1·80@2c.; Bessemer machinery, 1·30@1·50c.; open hearth machinery, 1·90@2c.; open hearth carriage spring, 1·90@2c.; crucible spring, 3·50@3·75c.

Old Material.—An increased volume of business is reported this week but prices continue weak and low. We quote nominally as follows: Old steel rails, $9@$9.75; old iron tees, $11.50@$12 per ton New York; railroad scrap, $12 per ton delivered at mill, and yard scrap at $10 vessel New York; old iron T rails, standard sections, $11.75@$12.00, New York delivery; wrought turnings, delivered at mill, $9; railroad scrap, also delivered at mill, $12: No. 1 wrought scrap at $9.50@$10, and No. 1 machinery cast scrap, $9.50@$10.50, old wrought tubes and pipe, $7@$8; wrought turnings at $8 50@$9,50 delivered at mill; old car wheel, $10@$11 New York; cast borings, $5.50@$6 delivered at mill.

Rail Fastenings.—We do not hear of any business in rail fastenings. The market continues dull, with quotations as follows: Fish and angle plates, 1 30@1·50c. at mill; spikes, 1·70@1·90c.; bolts and square nuts, 2·10@2·30c.; hexagonal nuts, 2 30@2·50c., delivered.

Spiegeleisen and Ferromanganese.—This market continues very quiet, with prices unchanged. We quote nominally: Spiegeleisen, 10@12%, $21@$22; 20%, $25@$26. Ferromanganese, $51.50@$53.

Steel Rails.—No business of any consequence is reported in steel rails this week. The market continues very quiet. The official or combination price for standard sections is still $24.80 tidewater, or $24 at mill.

NOTES OF THE WEEK.

The Thomas Iron Company, capital $2,500,000, has had its charter renewed.

A dispatch from Philadelphia says that a steel "combination" has been formed, to be known as the American Steel Casting Company, incorporated in New Jersey with a capital stock of $4,200,000. The following companies are said to be included in the combination: The Norristown Steel Company, of Norristown; the Standard Steel Casting Company, of Chester; the Sharon Steel Casting Company, of Alliance, O.; the Syracuse Steel Foundry Company, of Syracuse, N. Y., and a majority interest of the capital stock of the Pittsburg Steel Casting Company. The extent of the issue of bonds is limited to $700,000, which amount can never be exceeded, except by the consent of 75% of the stockholders, in stock value, being obtained. Under the policy of the new company, when there is not sufficient work to engage all the mills, some of them will be closed down, leaving those open full work. The board of directors of the American Steel Casting Company consists of Joseph H. Bohl, president of the Solid Company; Daniel Egan, president of the Sharon Steel Casting Company; Frederick Frazer, president of the Syracuse Steel Foundry Company; Augustus Trump, secretary and treasurer of the Pittsburg Steel Casting Company; George J. Humbert, manager of the Norristown Steel Company; Henry Weston, of New York, and Charles N. King.

Buffalo. March 29.

(Special report of Rogers, Brown & Co.)

Consumption is without doubt increasing. Offers are more freely given and just as freely taken. In consequence the market continues weak. We quote for cash f. o. b. cars Buffalo: No. 1 foundry strong coke Iron, Lake Superior ore, $12; No. 2 foundry strong coke iron, Lake Superior ore, $11.50; Ohio strong softener No. 1, $12; Ohio strong softener No. 2, $11.50; Jackson County silvery No. 1, $15.50@$17; Lake Superior charcoal, $14.75; Tennessee charcoal, $15.50; Southern soft No. 1, $12.25; Southern soft No. 2, $11.75; Alabama car wheel, $16@$17.50; Hanging Rock charcoal, $18.50.

Chicago. March 28.

(From our special correspondent).

The conditions of the iron market reported from here last week have shown somewhat of an improvement for the past seven days. Sales in almost all branches have increased slightly, though no one branch shows any decided advancement. Many dealers express a conviction that with each week now we can expect a continued light improvement, and that in the course of several months trade will again assume its normal aspect. Foreclosure proceedings have been commenced by the Wisconsin Marine and Fire Insurance of Milwaukee against the Chapin Iron Mining Company, of Iron Mountain, Mich. The amount due the bank is $86,000. The mine will probably be sold for debt under the foreclosure proceedings. The property has been idle since the Schlesinger failure last year.

Pig Iron.—A slight gain is noted in the number of sales for the past week, although orders have been chiefly for small quantities, the largest sales reported not exceeding 2,000 tons. Nearly all sales are for quick shipment, the consumer evidently wanting it to supply immediate demands, and takes no more than is absolutely necessary. As the season advances there is noticed some slight change in the general consumption, the actual tonnage appearing to increase with each week, and a better feeling to permeate the market. Prices are, per gross ton f. o. b. Chicago: Southern coke, foundry No. 1, $12@$12.25; No. 2, $11.25@$11.50; No. 3, $11; Southern coke foundry soft, No. 1, $11.25; No. 2, $10.75@$11; Southern car-wheel, $18@$18.25; Tennessee charcoal No. 1, $15@$15.50; Southern silveries No. 1, $13@$13.50; No. 2, $13@$13.50; Bessemer, $13.25; Ohio Scotch softeners No. 1, $14@$15; Lake Superior charcoal, $15@$15.50; Lake Superior coke No. 1, $11.75@$12.25; No. 2, $11.25@$11.50; No. 3, $10.50@$11; Jackson County silveries, $14.50@$15.50.

Structural Iron and Steel.—Orders for structural material are limited, business remaining in its inactive condition. Quotations are as follows: Chicago delivery: Angles, 1·35@1·45c.; tees, 1·55@1·65c.; universal plates, 1·35@1·45c.; beams and channels, 1·45@1·55c.

Plates.—Mill orders have increased considerable for the week, while trade from stock shows a slight gain. Prices are, Chicago delivery: Flange steel, 1·80@1·90c.; best firebox steel, 4·00@4·25c.; tank steel, 1·45@1·50c.; iron and steel sheets No. 10 to 14, 2·00@2·15c.

Merchant Steel.—Sales for the week have shown a real gain and the prospects are much better for future business. Low prices continue and there is much competition for business going. Quotations are, carload lots: Smooth finished machinery 1·80@1·90c.; tire steel, 1·75@1·85c.. ordinary bessemer bars, 1·40@1·50c; toe calks, 2·15@2·25c.; special brand tool steel, 12@20c.; crucible spring, 3·40@3 65c.; tool steel, 6½c. and upward.

Galvanized Sheet Iron.—Trade continues a little dull, though a slight gain is apparent for the week. Prices are 75, 10 and 5% off on mill shipments. Jobbing quantities are selling at 75% discount.

Black Sheet Iron.—Conditions in black sheet remain about as previous report. Inquiries are numerous, but fail to bring much business. Prices remain low, and are: Carload lots f. o. b. Chicago, No. 24, 2·40c.; No. 26, 2·50c.; No. 27, 2·60c.; with an advance of about 10c. per 100 lbs. for steel over corresponding gauges in iron.

Bar Iron.—The bright conditions noticed for some weeks past have had a little set-back the past week, business being confined to few sales of small lots. Mill prices are f. o b. Chicago 1 15@1·25c. for iron and1·25@1·30c. for soft steel bars.

Billets.—The demand has fallen off during the week, making consequently rather a poor business. Prices are $17.25@$17.75; rods are quoted at $25.

Steel Rails.—Business in steel rails has not improved at all with the week. Some orders are coming in, but they are mainly for very small quantities. Quotations are $25@$27 for standard sections.

Nails.—Wire nails are in fair demand. Steel cut have improved and quite a large business is now going. Prices are per keg $1.15@$1.25.

Scrap.—The scrap market remains exceedingly quiet. Prices are. Railroad $9.50@$10; No. 1 Forge, $8.50@$9. Cast borings, $4@$4.50; wrought turnings, $6.50; axle turnings, $6; mixed steel, $6@$6.50; tires, $13; iron axles, $13@$13.50.

Old Rails and Wheels.—Old rails have had but little attention and few fairly good orders are observed in old car wheels. Quotations are for old rails $10.50@$11. Old wheels are $10@$11.

Philadelphia. March 30.

(From our Special Correspondent).

Pig Iron.—The interest in pig iron has increased on account of railroad freight reductions, cheaper coal, ore and labor, and also on account of competing offers of Western iron in anthracite iron markets. New England buyers have been making fair purchases and larger transactions appear probable. Prices are a little lower, and founders are unwilling to consider more than $13 for No. 1. Good No. 2 is to be had at $12@$12 25 and forge at $11. The tendency is decidedly downward, and buyers are more cautious and hard to deal with than a few days ago.

Muck Bars.—Two or three sales have been made at $21, delivered.

Steel Billets.—Buyers who want billets are not willing to pay over $17 for billets at this time. The asking price is $17.25. Not as much business has been done as Western men confidently expected. There is not much to say, but important developments are promised very soon.

Merchant Iron.—There has been a slow growth of bar iron orders at Eastern Pennsylvania mills, and prospects are better, but no one familiar with the situation feels there is much to hope for in the future, because of the changed conditions. Mill owners are hoping against hope. Good iron is sold at 1·20, and even less at interior mills.

Skelp.—A better demand has set in for skelp. While it is quoted at 1·25@1 30 delivered, these prices have no reality.

Sheet Iron.—Competition is appearing from unexpected quarters even in sheet iron, and some home orders have been filled for the West. A large amount of business is being done, but Eastern makers are not obtaining all the increase.

Merchant Steel.—A steady demand is maintained for merchant steel of all kinds, but manufacturers are unwilling to run to full capacity. They prefer to nurse the market.

Plate and Tank.—Lower freight rates have unsettled a good many calculations and buyers are now more uncertain than last week about placing orders for all their requirements. Offers are made by Western makers to deliver iron at lower prices than have ever been known. Open quotations for tank steel to-day in large lots are 1·15; what private quotations are cannot be given. Heavy plates on small lots have been made at 1·35; flange, 1·50.

Structural Material.—Two or three orders aggregating 1,800 tons have been placed. As soon as railroad managers overcome their nervousness they will do something. There is a great deal of work in view and nothing but low rates and restricted traffic stand in the way of good orders. Angles are 1·15, beams tees and channels, 1·40@1·50c.

Steel Rails.—Makers have no information to give. A fair business is being done in girder rails.

Scrap.—Heavy steel is quoted at $10; light, $8; No. 1 wrought, $11; cast, $9.50.

Pittsburg. March 29.

(From our Special Correspondent.)

Raw Iron and Steel.—Prices of leading descriptions of raw and finished material have evidently touched what is termed bottom; this is what has been anxiously waited for. The better feeling manifested in soft steel billets has been maintained; the fact is there is no city in this country that can compete with Pittsburg in the manufacture of iron and steel.

The railroads have reduced freights from Pittsburg to Philadelphia, to take effect at once, the reduction amounting to 60c. a ton on steel billets and 50c on pig iron, with corresponding rates on various forms of finished materials. As long as rates are firmly maintained, whether high or low, the trade has some means of determining its position, but with secret cutting uncertainty and demoralization inevitably follow.

The rail trade promises a smaller business than for years past and with that missing it is hardly likely that there can be any marked improvement in general business. A million tons for the railroads is about the full estimate and may be much less. The price of puddling in the Mahoning Valley has been satisfactorily arranged at $4.00 per ton.

Iron-ore sales of 10,000 tons standard Bessemer f. o. b. cars, Cleveland dock, $2.75 cash are reported.

Coke Smelted Lake and Native Ore.

Tons.		Cash.
7,500	Bessemer, April, May	$10.40
5,000	Bessemer, April, May	10.45
2,000	Bessemer, April, May	10.50
1,500	Bessemer, April,	10.40
1,000	Bessemer, April.	10.50
1,000	Off Bessemer, Valley Furnace	9.15
1,000	Bessemer, April, May	10.50
1,000	Bessemer, May.	10.45
500	Gray Forge, April.	9.50
500	Grey Forge	9.60
350	Grey Forge	9 55
250	Grey Forge	9.60
200	No. 1 Foundry	11.75
200	No. 2 Foundry	10.75
100	No. 1 Silvery	14.50

Charcoal.

100	No. 2 Foundry	19.00
100	Cold Blast	25.00
50	Extra Foundry	28.50
50	Warm Blast	17.50
50	Cold Blast	25.50
50	No. 1 Foundry	19.80

Blooms, Billets and Slabs.

3,000	Billets, and slabs. April, May, at mill 15.80
2,500	Billets, April, May, at mill 15.90
1,500	Billets, April May, at mill 15.80
1,000	Billets, April, at mill 15.70
500	Billets, prompt at mill 15.75

Muck Bar.

500	Neutral, April....19.25
300	Neutral, April....19.75
200	Neutral, April....19.80

Skelp Steel.

4,000	Wide groove....1.10 4 m.
2,000	Narrow groovel.00 4 m.
1,200	Sheared.....1.00 4 m.

Skelp Iron.

500	Sheared.....1.27½ 4 m.
400	Nar. gr'ved..1.17½ 4 m.
300	Wide gr'ved.1.17½ 4 m.

Ferro-Manganese.

200	80% delivered $51.80
50	80% Domestic.....53.00

Sheet Bars.

400	At mill 20.75

Steel Wire Rods.

450	5 gauge American, at mill 24.50

Blooms, Billets, Bar Ends.

375	April, delivered. .10.50

Spelter.

100	Western 3.75

Old Rails.

1,000	Steel,mixed l'ngths 9.50
700	Iron rails 12.50
360	Steel Rails....10.00
50	Iron, light..... 12.00

Scrap Material.

700	Cast scrap, gross.. 9.00
200	Wrought scrap, gross 7.00
150	No. 1 wrought, net10.50
100	No. 1 wrought, net 10.25

METAL MARKET.

NEW YORK, Friday Evening, March 23, 1894.

Prices of Silver per Ounce Troy.

March.	St. Ex.	London Pence.	N. Y. Cts.	Value of $1.	March.	St. Ex.	London Pence.	N. Y. Cts.	Value of $1.
23	4.88⅛	....	59⅛	.458	27	4.87⅜	27⅛	59⅛	.458
25	4.88⅜	27⅛	59	.457	28	4.87⅛	27⅛	59⅛	.458
26	4.88	....	59	.457	29	4.87⅜	27⅛	59⅛	.460

Dullness has prevailed in the London silver market owing to the Easter holidays. As the production has fallen off it is reasonable to expect some advance in price as soon as business is resumed. It is not likely that we shall see prices much lower than those which have been prevailing for some two weeks past, as the demand is absorbing the offerings pretty well.

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

Gold and Silver Exports and Imports at New York, Week Ending March 24th, 1894, and for Years from January 1st, 1894, 1893, 1892.

	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week	$138,456	$146,972	$4·0,572	$113,337	E $358.749
1894...	5,823,152	2.742,512	10,175,104	391.018	E 12.861.726
1893...	33,700,178	5,145,656	6.947,015	848,812	E 34,752,725
1892...	12,043,255	5,359,059	5,755,808	339,523	E 12,100,481

The gold exported for the week went chiefly to Havana: the silver to London. The gold imported came from France, and the silver from the West Indies and Central America.

During the five days ending March 29 the exports and imports of gold and silver were as follows: Exports—Gold, $234,872; silver, $295,360. Imports—Gold, $142,376; silver, $8,403. Of the gold exported $107,000 was in American coin, $4,000 of which went to South America and $103,000 to the West Indies. The remaining $127,872 was in Spanish coin and went to the West Indies.

Of the silver exported $51,210 was in Mexican coin, $38,010 of which went to South America and $12,300 to London. The remaining $244,150 was in American coin and went to London.

Exports and imports of gold and silver at San Francisco were as follows for the two months ending February 28th:

	Exports.	Imports.		Excess.
Gold	$230,047	$298,325	Imp.	$68,278
Silver	1,614,098	456,165	Exp.	1,157 933
Total..	$1,844,145	$754,490	Exp.	$1,089,655

For the eight months of the fiscal year from July 1st to February 28, the total exports of gold were $981,688, against $848,696 in 1892-3; of silver $9,248,759, against $11,439,281 in 1892 3. The total imports of gold for the eight months were $2,537,738, against $5,402,145 in 1892-93; of silver $1,455,964, against $1,938,024 last year.

NOTES OF THE WEEK.

Business continues to show a steady, though still somewhat slow improvment, as our market reports indicate. The volume of business is increasing and manufacturers continue to resume operations. As before, the most unfavorable point is found in the labor troubles attending the readjustment of wages at various points, but these are in gradual process of settlement.

The bill for coining the seignorage was vetoed by the President on Thursday as was generally expected. Some notes on the veto will be found elsewhere. This removes one disturbing element in the situation, though its momentary effect was not great, since it had been confidentially anticipated. The President, in concluding his message, takes occasion to recommend that authority be given the Secretary of the Treasury to issue low-rate bonds, if necessary, to maintain a sufficient gold reserve.

The general debate on the tariff bill will begin in the Senate next Monday, April 2d. The general hope is that it will be confined to at least reasonable limits.

The statement of the New York banks for the week ending March 24th shows increases of $1,775,350 in reserve, $2,516,300 in loans, $62,400 in specie, $2,755,700 in loans and $4,199,000 in deposits; a decrease of $65,900 in circulation. The total reserve is $215,194.000, being $79,077,650 above the legal requirements.

The increase in loans is somewhat less than in the preceding week, and a lighter demand for time loans for trade purposes is reported. While business is slowly increasing in volume, the amount of commercial paper increases more slowly still, much of the new business being on a cash basis and involving comparatively few discounts. The volume of idle money is still very large, and funds continue to be sent from other points to New York in the hope of finding employment for it. The deposits in New York banks of funds from interior banks were last week $26,500.000 greater than in the middle of December, and $38,500,000 greater than in March, 1893. There is always a good deal of this money in New York, but the amount has never been larger than at present.

The statement of the United States Treasury on Thursday, March 29th, showed balances in excess of outstanding certificates amounting to $131,298,929, made up as follows: Gold, $106,097,144; silver, $10,653,195; legal tenders, $3,074,551; treasury notes, etc., $11,474,039. This shows an increase of $582 481 in the total balance, and a decrease of $491,057 in the gold balance.

The customs receipts have been somewhat light for the current month, and there have been some heavy payments for pensions; nevertheless the treasury balances continue to be well kept up.

The Bank of England on Thursday, March 29th, reported its total gold holdings at £30,790,120, an increase of £4.555 734 over the corresponding date in 1893. The bank reports this week an increase of £1,140.000 in loans, the largest increase for a number of weeks past. The general indications are of increased activity in the money market.

The Bank of France, on Tuesday, March 29th, reported its total specie holdings, in sterling, at £69,129,917 gold and £50,824.348 silver: an increase of £2,726.612 gold, and a decrease of £157,188 silver as compared with the corresponding date last year. Changes for the week were increases of £52,000 gold and £70,000 silver.

Shipments of silver from London to the East up to March 15th are reported by Messrs. Pixley & Abell's circular as follows:

	1893.	1894.	Changes.
India	£1,849.880	£1.606,510	D. £243.370
China	12.440	468,780	I. 456,340
The Straits	534,200	144,600	D. 389.600
Total	£2,396,520	£2,219,890	D. £176,630

No shipments were reported for the week this year, against £117,000 to India last year.

The large sales of Council bills and the 5% import duty seem for the present to have checked silver shipments to India. Large exports to China are not expected at this season, and the heavy shipments already made this year are not likely to be increased at present.

French imports for the month of February were valued at 433,910,000 francs, showing an increase over February, 1893, of 77,092,000 francs, or 21.6%; over two-thirds of the increase was in food and food products. The exports for the month were valued at 247,534,000 francs, a decrease of 9,078,000 francs, or 3.5% from last year.

It is said that the Mexican government is preparing to call a conference of the silver-using countries to discuss the present position of the monetary question and, if possible, to take some action. It is reported that all the South American States have been asked to join in the movement.

Our esteemed contemporary, the London "Economist," in a recent article says: India and other silver using countries are still suffering from the uncertainty surrounding the stability of silver

prices, but there are some grounds for believing that this difficulty will become less and less as the value of silver recedes to about its normal level.

Very many people think that silver is now considerably below its "normal" level. If it is to recede still further the values dependent upon it must be still more unsettled. The "Economist" might help us if it would indicate precisely what it considers the "normal" level, and upon what that level is based.

In a memorial which has been addressed to Lord Rosebery by the London Chamber of Commerce, it is stated that the East India and China trade section of the chamber having made representations to the council, the latter are impressed with the very strong feeling among those interested in trade in the East that the silver question is in an extremely unsatisfactory state, and they therefore suggest to the Prime Minister the advisability of Her Majesty's Government reconsidering the question of the expediency of taking steps in connection with the governments of other nations, to secure the resumption of the sittings of the International Conference. The following is a copy of the resolution passed by the East India and China trade section upon which the council have based their memorial: That, owing to the extremely unsatisfactory state of the silver question, and the grave injury inflicted upon our Eastern trade by the heavy fall and violent fluctuations in exchange and the great uncertainty as to the future, this section invite the council of the chamber to memorialize Her Majesty's Government to take such steps as will lead to the meeting of another International Conference, in hope that, with the further experience gained by the discussion of the question, some plan may be devised for remedying an evil which has dislocated business all over the East, and which seriously threatens irremediable injury to a trade amounting to nearly £250,000,000.

The Transvaal State mint in 1893 coined £62,000 in gold and £50,000 in silver. The large amount of silver is somewhat unexpected in a gold producing country.

A dispatch from Singapore says that the chamber of commerce there has voted its adhesion to the request made by the Hong Kong chamber of commerce for the coinage of a British silver dollar of the same weight and fineness as the Mexican dollar, for circulation in the East.

A table in the "Reichsanzeiger" gives the following statement of the coinage of the German mints last year and the value of the coinage outstanding at the close of the year:

	Coined in 1893.	Outstanding Jan. 1, 1894.
Gold:		
20 marks	80,327,700	2,171,247,780
10 marks	30,193,260	535,2 5,430
5 marks	.....	27,959 490
Total	110,420,960	2,734,462,700
Silver:		
5 marks	2,671,595	80,273,125
2 marks	3,289 210	111,742,216
1 mark	2,836,309	134,798,386
50 pfennigs	.....	71,482,435
20 pfennigs	.....	22,713,934
Total	8 797,114	471,010,096
Nickel:		
20 pfennigs	.....	5,005, 830
10 pfennigs	1,269.914	31,233,489
5 pfennigs	756,271	15,345,964
Total	2,026,185	51,588,283
Bronze		
2 pfennigs	.....	6,213,172
1 pfennig	311,956	6,074,113
Total	511,956	12,287,285

The table gives the value in marks (about 24c.) of the coins, and not the number of coins.

A document recently published by the British Foreign Office gives some interesting details on the monetary system of Japan; from this some extracts are given which have a bearing on the present situation not only in that country but in Europe and America. The importations of bar silver into Japan were exceptionally large during the fiscal year which ended March 31, 1893, and there was also a very large coinage, especially in silver pieces of one yen. In 1890-91 the silver imports into Japan were 6,000 troy ounces only. In the following year, 1891-92, there was an enormous increase, the amount reaching 3.518,000 oz., while in 1892-93 this again increased to 9.683,000 oz. If, instead of taking the figures of importation only, we take those showing the quantity of the white metal put into circulation, we must not neglect the product of the Japanese mines, which increased from 6,438,464 oz. in 1891-92 to 12,697,493 oz., or nearly double, in the following year. Although full returns have not yet been received, it is probable that there was a still further increase last year. The present expectation is that importations of silver and coinage will both show an increase during the current year; this, however, depends somewhat on the course of affairs in India. It is evident that everything which has a tendency to turn silver importations from India will also divert them toward other oriental countries, and notably toward Japan, whose large exports of silk, rice and other products are naturally stimulated by the fall in the price of silver in London and the lowering of Indian exchange. This is a serious factor and one not to be neglected in considering the monetary question. As heretofore noted, the Japanese Government appreciates the situation and is considering measures to increase its gold stocks and coinage.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	$.49	$.50
Peruvian soles and Chilean pesos	.48	.50
Victoria sovereigns	4.87	4.89
Twenty francs	3.90	3.93
Twenty marks	4.75	4.78
Spanish 25 pesetas	4.85	4.90

Other Metals.

Copper.—Throughout the week business has been very quiet, and must be expected to continue so, as, since the manufacturers have covered their requirements, they are, of course, out of the market, and the demand is thereby curtailed. Such of the Lake producing companies as took advantage of their opportunities, and sold recently feel sufficiently relieved to await developments, while those who did not sell them, and are now willing to accept at 9½c. are unable to find buyers, and we fear they will have either to bide their time or accept lower prices, the volume of business being not much more than half what it was last year, this fact alone being sufficient warrant for consumers continuing their conservative policy adopted some time back. The market for Arizona pig copper is not quite as firm as at the time of our last report, as the present price is 8·65. The makers of electrolytic copper have not yet fallen in line with the new order of things, so that during the last few days practically nothing has been done in this description, for which we understand 9¼ would readily be accepted now, but consumers, apparently, are unwilling to pay more than 9⅛. Casting copper is quiet at 9½.

Abroad, the market opened Tuesday morning, Monday having been a holiday, at the closing prices of last week, but these figures have not been maintained as the close is a little lower, at £40 15s. for spot and £41 5s. for three months prompt G.m.b's, while other sorts we have to quote as follows: English Tough, £43@£43 5s. Best selected, £44@£44 5s. Strong sheets, £50 10s @£51. India sheets, £48 15s.@£49. Ye low Metal, 4⅛d.

The demand for refined copper is very limited, not so much because of the prices that are ruling, as for the lack of business, which is reported to have considerably reduced in volume during the last few weeks.

Recent sales of furnace material in England are reported by Henry Bath & Sons' circular as follows: 1,500 tons Mason & Barry yellow ore at 7s. 6d.; 200 tons Mexican and Chile ore at 7s. 4½d.@7s. 6d.; 200 tons Chile regulus at 8s. 1½d.; 100 tons Sotcil precipitate at 8s. 3d. per unit. Furnace material is in short supply and a better demand is reported.

The exports of copper from Chile and Bolivia are given by Jackson Brothers' report as follows, in quintals of fine copper:

	1891.	1892.	1893.
Bar Copper	396,453	432,693	391,884
In regulus	23,851	61,694	49,542
In ores	18,380	3,6.1	29,617
Total, fine copper	438.684	498 018	471,043
" long tons	19,584	22,234	21.029

The exports of copper from the port of New York during the week ending March 30th, as reported by the New York Metal Exchange, were as follows:

Liverpool—Nomadic	Pigs	301	"
" Guido	Pigs	180	"
Swansea—Mohican	Bars	87	"
" —Jersey City	Bars	103	"
Liverpool—Bovic	Ingots	43	"
" "	Pigs	175	"
Swansea—Manhanset	Bars	99	"
" "	Pigs	11	"
Antwerp—Rhyland	Ingots	20	"
Hamburg—Acne	Cakes	20	"
" "	Bars	30	"
" "	Plates	10	"
Rotterdam—Werkendam	Sheets	100	"
" "	Ingots	50	"
" "	Plates	71	"
" "	Bars	26	"
Havre—Le Bretagne	Ingots	50	"
London—Massachusetts	Ingots	60	"
Liverpool—Cuffe	Ingots	100	"
Swansea—Jersey City	Pigs	75	"
Italy—San Giorgio	Ingots	25	"
Matte:			
Liverpool—Guido		87	"

Exports of copper from Baltimore for the week ending March 28th are reported by our special correspondents as follows:

March 21.—Bremen—Dresden	263 bars,	46,348 lbs.	
" 22.—Hamburg—Polynesia	1,191 cakes,	341,339	"
" " "	4.105 plates,	78 400	"
" " "	1,049 bars,	135,989	"
" " "	5,519 ingots,	94,802	"
" Rotterdam—Delano	1,434 "	22.400	"

Other metal exports were, 792 bundles and 8 bbls., 150,710 lbs., tin scrap to Rotterdam per "Delano," March 22d.

Tin.—Here the market has eased off during the week, in sympathy with that in London, but the decline here has not been as great as abroad, as when prices advanced there, those here did not follow to the full extent. We quote spot delivery at 19.20 and April at 19.20, with a fairly steady demand for metal for consumption.

In London, where last week's closing prices were £69 2s. 6d. and £69 17s. 6d. for spot and futures, respectively, there has been a heavy decline during the week, and, at the last, we have to quote £68 7s. 6d. for spot and £69 2s 6d. for future delivery.

Lead.—Offerings having been a little freer, not so much because of more active operations in the mining district as that some of the refiners who had accumulated a little stock are now attempting to realize, and as the consumers continue to buy only from hand to mouth, an easier market has been the natural result. We quote 3·40.

Practically no change has taken place in the markets abroad.

St. Louis Lead Market.—The John Wahl Commission Company telegraph us as follows: "Lead strong and fairly active at 3·20c.; perhaps 800 tons have sold on this basis during present week."

Spelter is somewhat easier in consequence of a decrease in the demand for it and we have to quote 3·70@3·80 New York. Abroad there is a slight improvement, as we have to quote good ordinaries at £15 13s. 9d. and specials at 2s. 6d. per ton more.

Antimony is quiet at the prices quoted a week ago: 10@10¼c. for Cookson's, 9⅜@9½c. for L. X., 8¾@9c. for Hallett's, 10c. for U. S. French Star.

Quicksilver.—The market is slightly higher this week and quotations are now: New York, $33.50; London, £5 10s.

Aluminum.—The makers quote No. 1, over 98% pure, 65c. per lb. for large lots, 75c. for small quantities: No. 2, from 94% to 96% pure, 60c. for large quantities, 73 for small lots. Wire from $1 25 to $2.58 per lb. according to size. Plates and sheets, 90c.@$1.50, according to width and thickness. The Neuhausen Company quotes $1 per kilo. (45c. per lb.) at the works at Neuhausen, in Switzerland, but we have heard of no importations.

Magnesium.—The Aluminum und Magnesium Fabrik, Hemelingen, Germany, quotes prices as follows: Ingots and cubes, $6.48 per kilogram; bars, $6.24; powder, $8.64, riboon and wire, $9.12 per kilo. These prices are at the works and for orders of over 10 kilos.; for less than 10 kilos. 24c. per kilo. must be added for ingots and bars, and 48c. for powder or wire.

Nickel.—Quotations are 45@55c. per lb., according to grade.

Platinum.—Messrs. Eimer & Amend, New York, quote platinum crucibles and dishes, hammered ware, French make, at 45c. per gram for smaller quantities, 43c. per gram for lots of not less than 100 grams, and 41c. for lots of not less than 250 grams. Wire and foil at 42c., 41c. and 40c. respectively for the qualities named. Current retail price for crucibles is 50c. per gram. At present platinum prices are steady.

Sodium.—Prices as quoted by the manufacturers in Germany and England, are 90c.@ $1 per lb. at works.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, March 30.

Heavy Chemicals.—On the whole, the heavy chemical market is in the condition described in our last report. There is a fair demand generally, and for some of the chemicals a better inquiry is reported. Prices remain practically as last quoted, as follows: Caustic soda, 60%, 2 77½@2·82½c.; 70%, 2·60@2 70c.; 74%, 2·62½@2·72½c.; 76%, 2 70@2·80c. Carbonated soda ash, 48%, 1·10@1·25c.; 58%, 1 05@1·15c. Alkali, 48%, 1·05@1·15c.; 58%, 1@1 10c.: according to package. Sal soda, English, ·95@1c.; American, ·80@·90c. Bleaching powder, 2·05@2·50c.

Acids.—There is not much change to report of this market. There has been some improvement in the demand and a slightly better business is doing. Prices, however, remain unchanged and we quote: Acids, per 100 lbs. in New York and vicinity, in lots of 50 carboys or more: Acetic, in barrels, $1.62½@$1 75; muriatic, 18°, 80c.@$1; 20°, 90c.@$1.10; 22°, $1@$1.25; nitric, 40°, $4; 42°, $4.50@$4.75; sulphuric, 75c.@$1. Mixed acids according to mixture, oxalic, $6.75@$7.25. Blue vitriol is quoted all the way from $3.37½ to $3 75; glycerine for nitro-glycerine, 11½@12½c., according to quality and quantity.

Brimstone.—This market continues quiet. There is no change in prices. We quote: Best unmixed seconds, on the spot or near due, $17.25; futures, $17. Thirds are $1 less.

Fertilizing Chemicals.—The fertilizer market continues to exhibit those features which characterized it at the time of our last report. The prospects are good for a very fair season. Manufacturers are busy and are absorbing more or less raw materials. Quotations show little change. Sulphate of ammonia is stronger and is quoted at $3.65@$3.70 for gas liquor and $3.55@$3.60, for bone. Dried blood, $2.40@$2.55 per unit for high grade and $2.25@$2.30 for low grade. Azotine, $2.40@$2.55. Concentrated phosphate (30% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15%, av. P_2O_5, 60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18% P_2O_5, 95c. per unit. Acidulated fish scrap, $15@$16, and dried scrap nominally $25 f. o. b. fish factory; wet scrap $15 f. o. b. fish factory. Tankage, high grade, $23@$24; low grade, $21.50@$22.50. Bone tankage, $23@$24; bone meal, $24@$25 50.

In lots of 50 tons on contracts we quote: Double manure salts, 48 53% (basis of 48%): New York and Boston, $1.12; Philadelphia, $1.14½; Charleston

Savannah, Wilmington, N. C., and New Orleans, $1.17. High grade manure salts, 90-95% and 96-99% (basis 90%), respectively: New York and Boston, $2.07@$2.11; Philadelphia, $2.09½@$2.13½. Charleston, Savannah, Wilmington, N. C., and New Orleans, $2.12@$2.16.

Phosphates.—Charleston, S. C., quotations are: Acid phosphate 13% available, $7@$7 50 cash in bulk. High grade phosphate rock is $4.75@$5 f. o. b. vessel and cars at mines.

Muriate of Potash.—In lots of 50 tons, quotations are as follows: 80-85% and minimum 95% (basis 80%), respectively: New York and Boston, $1.78@$1.91; Philadelphia, $1.80½@$1.83½; Charleston, Savannah, Wilmington, N. C., and New Orleans, $1.83½@$1.86.

Kainit.—Prices for kainit (minimum 23%) in cargo lots for 1894 delivery are as follows for invoice and actual weights respectively: New York, Boston and Philadelphia, $9@$9.25; Charleston, Savannah, Wilmington, N. C., and New Orleans, $9.75@$10. For sylvinit, 27-35%, prices are as follows per cent. per gross ton, invoice weights: New York, Boston and Philadelphia, 37½c.; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weights, 1c more per cent.

Nitrate of Soda.—This market continues strong and is slightly higher. Quotations are: Spot, $2 15; near-by, $2 10@$2.12½; June-August shipments, by sail, $1 90.

Liverpool. March 21.

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

There is very little doing in chemicals, and the Easter holidays have more attraction than business topics at present. The Liverpool markets close to-morrow evening and do not reopen until the 27th inst. Soda ash is as dull as ever as far as Leblanc makes are concerned, and quotations are quite nominal, the nearest range being about as follows: Caustic ash, 48%, £3 15s.@£4 per ton; 57-58%, £4 10s.@£4 15s. per ton; carb. ash, 48%, £3 5s @£3 15s. per ton; 58%, £3 10@£4 per ton, net cash. In ammonia ash, 58%, there is more doing, the reduction having stimulated the demand a little, and a fair trade reported at £3 10s. net cash, for casks, and 5s. less for bags. Some of the outside makers have not reduced their prices, but stopped their plants instead, so that the production is somewhat decreased. Soda crystals are neglected and easier at £2 15s.@£2 17s. 6d. per ton, less 5%.

Caustic soda hangs fire and orders are scarce. Quotations are nominal, ranging about as following, according to export market, viz: 60%, £7 15s. @£8 10s. per ton; 70%, £8 15s.@£9 10s. per ton; 74%, £9 15s.@£10 10s. per ton; 76%, £10 15s.@11 10s. per ton, net cash. For parcels under 10 tons 5s. per ton extra is charged.

Bleaching powder varies in price according to export market, ranging from £7 10s. to £8 5s per ton net cash for hardwood packages. For outside makes available for America there is a good inquiry, and everything offered is at once picked up at full prices. There is very little to be had, however.

Chlorate of Potash is depressed and prices quite nominal at about 7¾d. for prompt delivery, and even lower figures have been accepted for small lots. There is next to nothing doing in this article.

Bicarb. soda is in fair request at £6 15s. per ton, less 2½% per one cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia maintains its position and is quoted at £14 5s @£14 10s. per ton, less 2½%; for good grey 24-25% in double bags f. o. b. here, according to quality. Nitrate of soda strong and again higher, holders of spot lots now quoting £10 7s. 6d per ton, less 2½% for double bags f. o. b here. Carb. ammonia lump 3¾ per lb.; powdered 4d. per lb., less 2½%.

NOTES OF THE WEEK.

The Electrolytic Caustic Soda and Chlorine Trust, of Snodland, Kent, England, is about to convert itself into a limited liability company, under the title of the Electro Chemical Company, with a capital of £200,000 in 40,000 shares of £5 each, divided into 26,000 10 per cent preference shares and 14,000 ordinary shares. Subscriptions are now being invited for the 26 000 preference shares. The syndicate is to be given the 14,000 ordinary shares, plus £30,000 either in hard cash or preference shares. This is no doubt a large sum to give for a process protected only by patent law, although the validity of the patents for the production of caustic soda and bleach by electrolysis has been thoroughly well ascertained. There is, of course, nothing particularly novel in the electrolysis of a saturated solution of common salt and the obtaining thence of caustic soda and chlorine, the latter being subsequently passed into chambers containing lime and converted into bleaching powder. But the Snodland process has been experimented with on a commercial scale for some years, and our British exchanges say that the syndicate has succeeeded in overcoming the most important difficulties which have hitherto barred the way to commercial success. The anodes first employed were made of comparatively costly electric light carbons, and were rapidly eaten away. At present, instead of trying to discover some unattackable form of anode, the syndicate is using the cheapest possible form of carbon, consisting of the ordinary gas retort carbon set in a frame of stout strip lead, so arranged that the lead is not in contact with the electrolyte. The cost of replacing these anodes only amounts to a few shillings per ton of caustic soda. Another specialty of the process is the absence of any form of porous partition and the employment of cathodes of copper, covered with a superficial film of copper oxide, which prevents the back electro-motive force due to nascent hydrogen. Owing to these two improvements, the volts per electrolytic vat have been reduced from 6 to 4, the minimum theoretical voltage required being 2.02 volts.

MINING STOCKS.

[For complete quotations of shares listed in New York, Boston, San Francisco, Aspen, Colo; Baltimore, Pittsburg, St. Louis, London and Paris, see pages 310 and 312.]

NEW YORK, Friday Evening, March 30.

It requires literary ability of a very high order to write stirring weekly reports of the mining stock market, for the simple reason that it is always so dull and uninteresting. The public seems to take less and less interest in it every day.

The Comstocks are slightly lower than last week. They have been very quiet and no features of interest have developed. Consolidated California & Virginia declined from $2.80 to $2 25, with total sales for the week of 525 shares. There was a solitary transaction of 100 shares of Gould & Curry at 85c. and another of an equal number of shares of Hale & Norcross at 60c. Comstock Tunnel was quiet this week, only 500 shares being sold at 8c. Other sales were as follows: 100 shares of Yellow Jacket at 65c.; 1,000 shares of Andres at 29c.; 150 shares of Mexican at $1.55; 200 shares of Overman at 10c., and 100 shares of Potosi at 70c.

Of the California stocks, Standard Consolidated was the most active; there was quite a demand for it, and 800 shares changed hands at $1.30@$1.50. After paying the present dividend, the company will have about $37,000 in its treasury, exclusive of the returns for March, which have not yet been received. Bodie Consolidated shows sales of 300 shares at 7@7c.

The only Colorado stock to show any sales this week was Leadville Consolidated, of which 80 shares changed hands at 10@11c.

Silver King, which had not been traded in for several months, this week shows sales of 300 shares at 25c.

NOTES OF THE WEEK.

The Tennessee Coal, Iron and Railway Company reports net earnings for February at $56,200. Fixed charges were $59,700, showing a deficit of $3,500 for the month.

The Iowa & Illinois Coal Company will receive at the office of the Atlantic Trust Company in New York until May 5th offers to sell to the sinking fund 20 of its first mortgage gold bonds.

The Whitebreast Fuel Company will receive, at the office of the Atlantic Trust Company in New York, until May 5th, proposals to sell 30 of its general mortgage bonds for the sinking fund.

On March 30th a heavy snowslide in Canyon Creek in the Cœur d'Alene Mountains, in Idaho, buried several families, some 12 persons in all, near the Black Bear mine. The damage to the mine is not reported.

About 25 mining stock brokers held a meeting in Colorado Springs, Colo., on March 16th, to form a mining brokers' association. Among the interested persons, besides the brokers, were Messrs. Hagerman, Bolles, Buckman, Hays, Jackson and Heron. A general disposition was manifested in favor of forming an association, a feature of which would be an exchange. A committee was appointed, consisting of 17 prominent business men, including merchants and bankers, but no brokers, who should constitute a committee on membership. All the names of brokers who wish to belong shall first be presented to this committee, and the requisite for membership is an honorable standing in the community and good business record. This was done in order to do away with any petty jealousies which might arise among brokers. Seventeen members of the committee are to constitute the nucleus of the association. The matter of fees, rules and other details was left to a sub-committee.

San Francisco. March 23.

(From our Special Correspondent.)

The San Francisco Stock and Exchange Board has adopted an amendment to the constitution which, to say the least, is very suggestive. Under the new ruling fluctuations are permitted of 1c. per share in all mining stocks upon the list which sell below $1 per share. Heretofore 5c. per share has been the limit. Of course this amendment was introduced and adopted with the end in view of stimulating business—another bait to many gudgeons. It in reality is simply another evidence, if such were wanting, of the decadence of legitimate speculation in the stock market. If, instead of reducing listing fees, annual dues and reducing the limit of fluctuation, the brokers unitedly opposed the proxy system of voting now in vogue with all the companies whose stock is listed in the two boards, a very speedy revival in bidding would follow. Primarily the brokers have been to blame for the wholesale corruption and thievery that have and do today flourish.

During the current week stocks have dragged badly and for the most part sales have been for account of bear operators and those holding margins. The news from the mines has not been of such character as to stimulate prices, and the week has been notable only for the general stagnation prevailing. Consolidated California & Virginia declined to-day to $2.60, and sold at 10c. off before the close in the afternoon. Ophir ruled at $2 35, Mexican at $1.35, Sierra Nevada at $1.00 and Union Consolidated at 75c.

In the middle group of Comstocks Potosi has sold steadier than any on the list, but while opening fairly strong to-day at 95c. it, also, shaded off during the day to 90c; Best & Belcher ruled at $1.35; Chollar, at 39c.; Gould & Curry at 65c.; Hale & Norcross, at 50c. and Savage at 36c.

While trading in Gold Hill stocks has been very limited they in sympathy with the general market have shown a decided tendency to steadily decline. To-day Belcher sold for 65c.; Bullion for 37c.; Crown Point, for 45c.; Challenge, for 37c. and Yellow Jacket, for 60c. The last quoted strengthened a trifle during the afternoon, but the market generally still further shaded off before the close.

SAN FRANCISCO, March 30 (*By Telegraph*).—The opening quotations to day were as follows: Best & Belcher, $1 15; Bodie, 10c.; Bulwer, 5c.; Chollar, 20c.; Consolidated California & Virginia, $2.15; Eureka Consolidated, 15c.; Gould & Curry, 51c.; Hale & Norcross, 42c.; Mexican, $1 15; Mono, 4c.; Navajo, 10c.; Ophir, $2 20; Savage, 26c.; Sierra Nevada, 85c.; Union Consolidated, 60c.; Yellow Jacket, 52c.

London. March 21.

(From our Special Correspondent.)

The mining stock market continues to exhibit the increased liveliness that has come upon it during the present year, although just for the moment the approach of the Easter holidays has made things rather quieter. To all appearances the excessive dullness has permanently ended, and although business is by no means extensive, it is at least of a healthy description. There is not much of importance to report concerning the movements of American mining stocks. Elkhorns remain stationary in spite of the excellent yearly report referred to last week. De Lamars and Harqua Halas have weakened a little on account of the appearance of large sellers, but this has nothing to do with the prospects of the mines. Montanas have been bought quietly during the week and the price has strengthened by about a shilling. Among low priced shares, Idaho Explorings and La Platas have been bought freely, while Palmarejos have been sold at lower prices than have ruled lately.

A new company has been registered under the name of the Santa Francisca Gold Mines, Limited, to acquire gold mines in the Republic of Nicaragua, with a capital of £300,000, but no information relating to the property is forthcoming at present.

The African Gold Recovery Company announces that 44,500 oz. of gold have been recovered by the cyanide process in the Witwatersrand district during February, and 7,000 oz. in other districts of the Transvaal. They produced 29% of the output for February.

The output of the Witwatersrand district is still advancing, by leaps and bounds. The production for January was 149,814 oz., as compared with 146,357 oz. in December, and 103,374 oz. in January, 1893; of the amount 149,814 oz. the cyanide process is credited with 43,500 oz., or 29% of the whole. In other districts in South Africa the gold recovered by this process was 7 500 oz.

It may be advisable to record in these columns the failure of the firm of Scott and Jackson, Limited, which carried on business in London as American and colonial land and estate agents and private bankers. They were connected with the Western states, especially California.

DIVIDENDS.

Pennsylvania Salt Company, dividend of 6%, payable April 16th at the office of the company in Philadelphia, Pa.

Tennessee Coal, Iron Railroad Company coupons due April 1st on the Tennessee Division bonds will be paid on and after April 2d at the Fourth National Bank, New York City, and coupons due April 1st on the bonds of the Alice Furnace Company and on the first and second mortgage bonds of the Tennessee Coal and Railroad Company will be paid on and after April 2d at the Mechanics' National Bank, New York City.

MEETINGS.

Arnold Mining Company, at the office of the company, room 4, No. 19 Exchange Place, Boston, Mass., April 16th, at 10 a. m.

Centennial Mining Company, at the office of the company, No. 192 Broadway, New York City, April 11th, at 12 o'clock noon.

Central Mining Company, at the office of the company, No. 76 Wall street, New York City, April 2d, at 12 o'clock noon.

Consolidated Wyoming Gold Mining Company, at the office of the company, No. 308 Pine street, San Francisco, Cal., April 4th, at 12 o'clock noon.

Franklin Mining Company, at the office of the company in Boston, Mass., April 18th, at 2 p. m.

Southern Cross Gold Mining Company, at McDermott Hotel, at Butte City, Mont., April 30th, at 2:30 p. m.

NEW YORK MINING STOCK QUOTATIONS.

DIVIDEND-PAYING MINES.

Name and Location of Company.	Mar. 24.		Mar. 26.		Mar. 27.		Mar. 28.		Mar. 29.		Mar. 30.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Belcher, Nev.	....	....	....	....	....	....	....	....	....	....	....	....	....
Belle Isle, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Bodie Cons., Cal	....	....	....	....	....	....	.05	....	....	....	.07	....	300
Bulwer, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Carysolite, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Comstock T. bonds, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
" scrip., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Cons. Cal. & Va. Nev	2.80	....	....	....	2.80	....	....	....	2.45	....	2.25	....	525
Crown Point, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Deadwood, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Eureka Cons., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Father de Smet, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Gould & Curry, Nev	.81	....	....	....	....	....	....	....	....	....	....	....	100
Hale & Norcross, Nev	.60	....	....	....	....	....	....	....	....	....	....	....	100
Homestake, Dak	....	....	....	....	....	....	....	....	....	....	....	....	....
Horn Silver, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Kentuck, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Leadville Cons., Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Little Chief, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Moulton, Mont	....	....	....	....	....	....	....	....	....	....	....	....	....
Mt. Diablo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Navajo, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Belle Isle, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Ontario, Utah	....	....	....	....	....	....	....	....	....	....	....	....	....
Ophir, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Plymouth, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Quicksilver, Pref., Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
" Com., Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Robinson, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Sierra Nevada, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Silver King, Ariz	....	.25	....	....	....	.25	....	....	....	....	....	....	300
Standard Cons., Cal	1.30	....	....	1.50	....	1.50	....	....	....	....	....	....	800
Yellow Jacket, Nev	....	....	....	....	....	....	....	....	....	....	.55	....	100

NON-DIVIDEND-PAYING MINES.

Name and Location of Company.	Mar. 24.		Mar. 25.		Mar. 27.		Mar. 28.		Mar. 29.		Mar. 30.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am. Flag	....	....	....	....	....	....	....	....	....	....	....	....	....
Alpha	....	....	....	....	....	....	....	....	....	....	....	....	....
Andes	....	....	23	....	....	....	....	....	....	....	....	....	1,000
Barcelona, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Belmont, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Best & Belcher, Nev	....	....	....	....	....	....	....	....	....	....	1 25	....	100
Brunswick, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Bullion, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Challar, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Comstock T., Nev	....	....	....	....	....	....	.08	....	....	....	....	....	500
Con. Imperial, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
El Cristo, Rep. of Col	....	....	....	....	....	....	....	....	....	....	....	....	....
Exchequer, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Independence, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Julia, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Justice, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
King & Pembroke	....	....	....	....	....	....	....	....	....	....	....	....	....
Lacrosse, Colo	....	....	....	....	....	....	....	....	....	....	....	....	....
Mexican, Nev	1.55	....	....	....	....	....	....	....	....	....	....	....	150
Middle Bar, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
Minnesota Iron	....	....	....	....	....	....	....	....	....	....	....	....	....
Nevada Queen, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Standard, Cal	....	....	....	....	....	....	....	....	....	....	....	....	....
N. Commonwealth, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Overman, Nev	....	....	10	....	....	....	....	....	....	....	....	....	200
Oriental & Miller, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Phœnix of Aris	....	....	....	....	....	....	....	....	....	....	....	....	....
Potosi, Nev	....	....	.70	....	....	....	....	....	....	....	....	....	100
Scorpion, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Seg. Belcher, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Union Cons., Nev	....	....	....	....	....	....	....	....	....	....	....	....	....
Utah, Nev	....	....	....	....	....	....	....	....	....	....	....	....	....

*Ex-dividend. †Dealt in at New York stock Ex Unlisted securities. ‡Assessment paid. §Assessment unpaid. Dividend shares sold 3,025. Non-dividend shares sold, 2,050.
Total shares sold, 5,075.

BOSTON MINING STOCK QUOTATIONS.

Name of Company.	Mar'h 23.*	March 24.	March 25.	March 27.	March 28.	March 29	Sales.
Atlantic, Mich	....	....	10.25	....	....	....	115
Breece, Colo	....	....	....	....	....	....	....
Bonanza Development	....	27.00	27.25	27.00	27.00	26.75	665
Calumet & Hecla, Mich	....	300	300	300	300	....	15
Central, Mich	....	....	....	....	....	....	....
Coeur d'Alene, Id	....	....	....	....	....	....	....
Franklin, Mich	....	....	10.00	....	10.00	9.75	170
Honorine, Utah	....	....	....	....	....	....	....
Horn Silver, Utah	....	....	....	....	....	....	....
Kearsarge, Mich	....	....	....	6 50	....	....	5
Lake Superior, Iron	....	....	....	....	....	....	....
Minnesota Iron, Minn	....	....	....	....	....	....	....
Napa, Ca	....	....	....	....	....	....	....
Ontario, Utah	....	....	....	....	....	....	....
Osceola, Mich	....	....	25.50	25 00	25.50	....	300
Quincy, Mich	....	120	....	....	93.00	91.00	92.00	....	92 00	91.00	137
Quincy Mining Rights	....	27 50	27 00	30.0	....	31.00	30.00	33.50	33 00	30.50	30.00	747
Silver Ledge, Ariz	....	....	....	....	....	....	....	....	....	....	....	....	....
Tamarack, Mich	....	165	....	....	....	....	169	165	167½	167	....	165	....
Tecumseh, Mich	....	....	....	....	....	....	....	....	....	....	....	....	....

Name of Company.	Mar'h 23.*	March 24	March 26.	March 27.	March 28.	March 29.	Sales.
Allouez, Mich	....	....	....	....	....	....	....
Arnold, Mich	....	....	....	....	1.00	....	600
Aztec, Mich	....	....	....	....	....	....	....
Brunswick, Cal	....	....	....	....	....	....	....
Butte & Boston, Mont	....	10.25	10.50	10.50	10.25	10.25	895
Centennial, Mich	....	3.88	....	....	....	3.75	175
Colchis, N. Mex	....	....	....	....	....	....	....
Copper Falls, Mich	....	....	....	....	....	....	....
Hanover, Mich	....	....	....	....	....	....	....
Humboldt, Mich	....	....	....	....	....	....	....
Huron, Mich	....	....	....	....	....	....	....
Menard, Mich	....	....	....	....	....	....	....
National, Mich	....	....	....	....	....	....	....
Native, Mich	....	....	....	....	....	....	....
Oriental & M., Nev	....	....	....	....	....	....	....
Phœnix, Ariz	....	....	....	....	....	....	....
Pontiac, Mich	....	....	....	....	....	....	....
Tamarack, Jr., Mich	....	18.25	17.00	....	16.00	....	145
Washington, Mich	....	....	....	....	....	....	....
Wolverine, Mich	....	....	....	....	2 25	....	50

* Holiday. Dividend shares sold, 2,320. Non-dividend shares sold, 1,865. Total shares sold, 4,185.

CURRENT PRICES.

These quotations are for wholesale lots in New York unless otherwise specified.

Acid—Acetic, chem. pure .17@.19
Commercial, in bbls, and cbys .01¾@.02
Carbonic, liquefied, ℔ lb .18@.25
Chromic, chem pure, ℔ lb 1.00
for batteries .40
Hyarobromic, dilute, U. S. P .25@.30
Hydrocyanic, U. S. P .45@.50
Hydrofluoric .21@.30
Alcohol—95%, ℔ gall $2.30@$2.40
Absolute $3.80
Ammoniated $2.80
Alum—Lump, ℔ cwt $1.75@$1.85
Ground, ℔ cwt $1.85@$1.90
Powdered, ℔ lb .04½@.05
Lump ℔ ton, Liverpool £5
Aluminum Chloride—Pure, ℔ lb $1.25
Amalgamating solution, ℔ lb .60
Sulphate, ℔ cwt $1.90@$2.50
Ammonia—Sal., in bbl. lots, ℔ lb .07½@.08
Carbonate, ℔ lb., English and German, .07½@.08
Muriate, white, in bbls., ℔ lb .08½
Aqua Ammonia—(in cbys) 3° ℔ lb .03@.04
20°, ℔ lb .04@.05
26°, ℔ lb .04½@.05
Antimony—Oxymur, ℔ lb .04@.06
Regulus, ℔ lb .10@.11½
Argols—Red, powdered, ℔ lb .15
Arsenic—White, powdered ℔ lb .03@.03½
Red ℔ lb .065@.07
Yellow .08@.09
White at Plymouth, ℔ ton £12 2 6
Asbestos—Canadian, ℔ ton $50@$300
Italian, ℔ ton, c. i. f. L'pool £18@£60
Ashes—Pot, 1st sorts, ℔ lb 4.75@5
Pearl .05½@.06¾
Asphaltum—
Prime Cuban, ℔ lb .04@.05
Hard Cuban, ℔ ton $28.00@$30.00
Trinidad, refined, ℔ ton $30.00@$35.00
Egyptian and Syrian, ℔ lb .05@.07½
Californian, at mine, ℔ ton $12.00@$26.00
at San Francisco, ℔ ton $15.00@$29.00
Barium—Carbonate, pure, ℔ lb .45
Carbonate, commercial, ℔ lb .05@.10
Chlorate, crystal, ℔ lb .75
Chloride, commercial, ℔ lb .05@.10
pure, ℔ lb .16
Iodide, ℔ oz .40
Nitrate, ℔ lb .06½@.07
Sulph., Am. prime white, ℔ ton $17.50@$19
Sulph., foreign, floated, ℔ ton $21@$24
Sulph., off color, ℔ ton $11.50@$15.00
Carb., lump, f. o. b. L'pool, ℔ ton .£6
No. 1, Casks, Runcorn, " " £4 10 0
No. 2, bags, Runcorn, " " £3 15 0
Bauxite—℔ ton $10.00
Bichromate of Potash—Scotch, ℔ lb .11@.12
American, ℔ lb .11@.12
Bichromate of Soda—℔ lb .09½@.10
Borax—Refined, ℔ lb., in car lots .08@.09
San Francisco .08@.08½
Concentrated, in car lots .07½@.08
Refined, Liverpool ℔ ton £2
Bromine—℔ lb .25@.35
Cadmium Minion—℔ lb $2.00
Cadmium Iodide—℔ lb $5.50
Chalk—℔ ton $1.50@$2.25
Precipitated, ℔ lb .04@.06
China Clay—English, ℔ ton $13@$18.00
Domestic, ℔ ton $9@$11
Chlorine Water—℔ lb .10
Chrome Yellow—℔ lb .10@.25
Chrome Iron Ore—℔ ton, San Francisco $10.00
Chromium—Pure, ℔ lb .35@.40
Commercial, ℔ lb .02½
Cobalt—Oxide, ℔ lb $1.60@$1.70
Copper—Sulph. English Wks. ton £20@£21
Vitriol (blue), ordinary, ℔ lb. 03¾@.03¾
" extra .04½
Nitrate, ℔ lb .40
Copperas—Common, ℔ 100 lbs .85@.95
Best, ℔ 100 lbs $1.35@$1.50
Liverpool, ℔ ton, in casks £2@£2 10s.
Corundum—Powdered, ℔ lb .04½@.09
Flour, ℔ lb .03
Cryolite—Pow., ℔ lb., bbl. lots .07@.08
Emery—Grain, ℔ lb. (℔ kg.) .04½@.05
Flour ℔ lb .02½@.04
Epsom Salt—℔ lb 01@.01½
Feldspar—Ground, ℔ ton $6.00@$10.00
Crude $2.00@$3.00
Fluorspar—Powdrd, No. 1, ℔ ton $20@$30
Lump, at mine $6@$8
French Chalk—
Fuller's Earth—Lump, ℔ ton $16@$20
Glauber's Salt—in bbls., ℔ lb .01@.01¼
Glass—Ground, ℔ lb .09@.10
Gold—Chloride, pure, crystals, ℔ oz $12.00
pure, 15 gr., c. v., ℔ doz $5.40
liquid, 15 gr., g. s. v., ℔ doz $5.50
Chloride and sodium, ℔ oz $6.00
15 gr., c. v., ℔ doz $2.75
Oxide, ℔ oz $27.25
Gypsum—Calcined, ℔ bbl $1.25@$1.50
Land Plaster
Iodine—Resublimed, ℔ oz .30@ 33
Iridium—Oxide ℔ lb $90
Iron—Nitrate, 40°, ℔ lb .01@.01¼
47°, ℔ lb .02@.02½
Kaolin—*See China Clay.*
Kieserite—℔ ton $9@$10
Lead—Red, American, ℔ lb .06¾@.07¼
White, American, in oil, ℔ lb .06½@.07½
White, English, ℔ lb., in oil .08½@.08¾
Acetate, or sugar of, white .06@.06½
Granulated
Nitrate .09@.12
Lime Acetate—Am. Brown .90@.95
" Gray $1.75@$1.87½
Litharge—Powdered, ℔ lb .05½@.07½
English flake, ℔ lb .06@.09½
Magnesite—Crude, ℔ ton of 1,015 kilos $14.75
Calcined, ℔ ton of 2,240 lbs $22.00
Brick, ℔ ton of 2,240 lbs $47.50
Manganese—Ore, per unit .23@.28
Oxide, ground, ℔ lb .02½@.06½
Mercuric Chloride—*(Corrosive Sublimate)* ℔ lb .62@.64
Powdered ℔ lb .6
Marble Dust—℔ bbl $1.25@$1.50
Metallic Paint—Brown ℔ ton $20@$25
Red $20@$25
Mica—In sheets according to size. 1st quality, ℔ lb 25@$6.00
Mineral Wool—Ordinary slag .01½
Ordinary rock .02½
Ground, ℔ ton
Naphtha—Black $10.00
Nitre Cake—℔ ton $10.00
Ochre—Rochelle, ℔ lb .01¼@$01¾
Washed Nat Oxf'rd, Lump, ℔ lb .06½@.06¾
Washed Nat Oxf'rd, Powder, ℔ lb .07@.07½
Golden, ℔ lb .03@.05
Domestic, ℔ lb $12@$20
Oils, Mineral—
Cylinder, light filtered, ℔ gal .14@.16
Dark filtered, ℔ gal .10@.13
Extra cold test, ℔ gal .20@.24
Dark steam refined, ℔ gal .07½@.12
Phosphorus—℔ lb .50@.55
Precip., red, ℔ lb .80@.85
white, ℔ lb .85@.90
Platinic Chloride—Dry, ℔ oz $7
Plumbago—Ceylon, ℔ lb .04@.06
American, ℔ lb .05@ 07
Potassium—Cyanide, ℔ lb., C. P. 67¼, ℔ lb .40
mining .28@.3
Bromide, domestic, ℔ lb .28@ 32
Chlorate, English, ℔ lb .18@.18¼
Chlorate, powdered, English, ℔ lb .18½@.19
Carbonate, ℔ lb., by casks, 82% .04½@.05
Caustic, ℔ lb., pure stick .05½@.06
Iodide, ℔ lb $2.58@$2.80
Nitrate, refined, ℔ lb .06@.08
Bichromate, ℔ lb .10@.11¼
Yellow Prussiate, ℔ lb .21½@.22½
Red Prussiate, ℔ lb .39@.40
Pumice Stone—Select lumps, ℔ lb .03½@.15
Original cks., ℔ lb .01½@.02
Powdered, pure, ℔ lb .01½@.01¾
Pyrites—Non-cupreous, ℔ units .10@.11
Quartz—Ground, ℔ ton $6.00@$10.00
Rotten Stone, Powdered, ℔ lb .03¼@.03½
Lump, ℔ lb .06@.07
Original cks, ℔ lb .04½@.05½
Rubbing stone, ℔ lb .03½@.04
Sal Ammoniac—lump, in bbls., ℔ lb .80¼
Salt—Liverpool, ground, ℔ sack .70
Domestic, fine, ℔ ton $7@$7.5
Common, fine, ℔ ton $4.50@$5
Turk's Island, ℔ bush .26@.28
Salt Cake—℔ ton $10.00@$15.00
Saltpeter—Crude, ℔ lb .03¼@.04
Soapstone—Ground, ℔ ton $6@$
Block and slab according to size.
Sodium—Prussiate, ℔ lb .22@.24
Phosphate, ℔ lb .04@.05
Stannate, ℔ lb .06@.12
Tungstate, ℔ lb .30@.35
Hyposulphite, ℔ cwt., in casks $1.70@$1.80
Strontium—Nitrate, ℔ lb .08½@.06
Sulphur—Roll, ℔ lb .01¼@.02½
Flour, ℔ lb .01½@.02
Sylvinit, 27@35%, S.O.P., per unit, 3.75
Talc—Ground French, ℔ lb .01¼@.01¾
American No. 1, ℔ lb .01¾@.01¾
American No. 2 006
Terra Alba—French, ℔ lb .65@.80
English, ℔ lb .65@.80
American, No. 1, ℔ lb .60@.80
American, No. 2, ℔ lb .40@.50
Tin—Crystals, in kegs or bbls .14@.15
feathered or flossed .20
Muriate, single .07@.12
Double or strong, 54° B .10@.15
Oxymur, or nitro .19
Vermillion—Imp. English, ℔ lb .80
Am. quicksilver, bulk .57 @.59
Am. quicksilver, bags .58 @ .60
Chinese .85 @$1.00
Trieste .90 @ .95
American .11½@ .12
Zinc White—Am., Dry, ℔ lb .04½@.05
Antwerp, Red Seal, ℔ lb .06¼@.07
Paris, Red Seal, ℔ lb .07½@.08
Muriate solution .06
Sulphate crystals, in bbls., ℔ lb .03@.03¼

THE RARER METALS.

The prices given below are the prices in Germany, and are per gramme except where otherwise stated:

Arsenic (metallic), per kilo $0.25
Barium (ex amalgam) 2.12
" (per electrol.) 7.75
Bismuth (metallic), per kilo 6.25
Cadmium (metallic), " 2.75
Calcium (per electrol.) 5.25
Certum (pulv.) 2.25
" (fusum in globulis) 5.50
Chromium (fus.) .40
" (cryst.) .75
Cobalt (metallic), per kilo 10.00
" (pure), per kilo 40.00
Didymium (pulv.) 5.50
Erbium-Yttrium (oxydat.) 10.00
Gallium (cryst.) 100.00
Germanium (fus.) 37.50
" (pulv.) 35.00
Glucinum (pulv.) 7.00
" (cryst) 10.75
Indium 5.00
Iridium (fusum) 1.25
Lanthanum (pulv.) 6.00
" (per electrol.) 11.00
Lithium (in glob.) 5.00
" (wire) 6.25
Manganese (fusum) .25
Molybdenum (pulv.) .12½
Niobium (pulv.) 4.25
Osmium 1.00
Palladium (wire) .06
" (pulv.) 1.00
Potassium (metal), per kilo 27.50
Rhodium 1.63
Ruthenium 2.50
Rubidium 6.25
Selenium (cryst.) .50
" (precipitates) .62½
Strontium (per electrol.) 7.25
" (ex amalgam) 1.25
Tantalum 4.75
Tellurium (fusum) .50
" (precipitates) .22½
Thallium .08¾
Titanium 1.13
Tungsten (pure) .05
Uranium 1.00
Vanadium 4.00

DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total Levied	Date and amount of last.			Dividends. Total paid.	Date & amount of last.		
1	Adams, s. l. c.	Colo.	$1,500,000	150,000	$10	*				$6-7,500	Jan.	189	[illegible]
2	Alaska-Treadwell, g.	Al'ska	5,000,000	200,000	25					1,900,000	Oct.	1893	.37½
3	Alice, s.	Mont.	10,000,000	400,000	25	*				975,000	Nov.	1891	.06¼
4	Amador, g.	Cal.	1,250,000	[illegible]	5	*				31,250	Aug.	1890	.12½
5	American, g.	Colo.	3,000,000	300,000	10	*				225,000	Mar.	1892	.05
6	American Belle, s.g.c	Colo.	2,000,000	400,000	5	*				50,000	April	1891	.12½
7	Americ'n & Nettie, g.s	Colo.		300,000						175,000	Mar.	1892	.05
8	Atlantic, c.	Mich.	1,000,000	40,000	25	280,000	April	1875	$1.00	700,000	Feb.	1891	.00
9	Argyle, g.	Colo.	1,000,000	1,000,000	1	*				20,000	Mar.	1892	.01
10	Aspen Mg. & S., s. l.	Colo.	2,000,000	200,000	10	*				860,000	Dec.	1893	.10
11	Aurora, i.	Mich.	2,500,000	100,000	25					650,000	Feb.	1893	2.00
12	Badger, s	Ont.	250,000	50,000	5					37,500	Mar.	1890	.25
13	Bald Butte	Mont.	250,000	250,000	1	*				157,500	Mar.	1894	.05
14	Bates Hunter, s. g.	Colo.	1,000,000	1,000,000	1					67,500	Dec.	1891	.00¾
15	Belle Isle, s.	Nev.	10,000,000	100,000	100	230,271	Sept	1893	.10	300,000	Dec.	1879	.25
16	Belcher, s. g.	Nev.	10,400,000	104,000	100	3,262,900	Nov.	1893	.20	15,397,000	April	1876	1.00
17	Bellevue, Idaho, s. l.	Idaho	1,250,000	125,000	10	120,000	Dec.	1889	.25	200,000	Jan.	1890	.19
18	Best Friend	Colo.	1,000,000	1,000,000	1	*				90,000	Feb.	1892	.01
19	Bi-Metallic, s. g.	Mont.	5,000,000	200,000	25					1,630,000	June	1893	.10
20	Bodie Con., g. l.	Cal.	10,000,000	100,000	100	714,990	July	1893	.15	1,602,572	April	1885	.50
21	Boston & Mont., g.	Mont.	2,500,000	250,000	10	*				520,000	June	1886	.15
22	Boston & Mont., c. s.	Mont.	3,125,000	125,000	25	*				2,075,000	Nov.	1891	1.00
23	Brotherton, i.	Mich	2,000,000	80,000	25	*				120,000	Mar.	1893	.50
24	Bulwer, g.	Cal.	10,000,000	100,000	10	155,000	July	1893	.15	190,000	Oct.	1892	.05½
25	Bunker Hill & S., s. l.	Idaho	3,000,000	300,000	10	*				150,000	Oct.	1888	.06
26	Caledonia, g.	Dak.	[illegible]	100,000	100	505,000	May	1885	.15	192,000	Oct.	1890	.08½
27	Calliope, s.	Colo.	1,000,000	1,000,000						140,000	Jan.	1891	.00
28	Calumet & Hecla c	Mich.	2,500,000	100,000	25	1,200,000				39,850,000	Sept.	1893	5.00
29	Centen'l-Eureka, s. l.	Utah.	1,500,000	30,000	50	30,000	Mar.	1888	1.00	765,000	Dec.	1893	1.00
30	Central, c.	Mich.	500,000	20,000	25	100,000	Oct.	1861	.65	1,970,000	Feb.	1891	1.00
31	Champion, g	Cali	340,000	34,000	10	150,000				139,700	July	1893	.10
32	Chrysolite, s. l.	Colo.	10,000,000	200,000	50	*				1,650,000	Dec.	1884	.25
33	Clay County, g.	Colo.	200,000	200,000	1	*				56,000	Nov.	1891	.02
34	Clinton Con, g	Cal.	5,000,000	100,000	5					90,000	Nov.	1891	.10
35	Coeur D'Alene, s. l.	Idaho	5,000,000	500,000	10					310,000	June	1893	.03
36	Colorado Central, s. l.	Colo.	2,750,000	275,000	10	*				502,66[illegible]	April	1893	.05
37	Commonwealth, s.	Nev.	10,000,000	100,000	100	200,000	Nov.	1893	.10	20,000	Nov.	1890	.20
38	Confidence, s. l.	Nev.	2,496,000	24,960	100	1,589,5[illegible]0	Aug.	1892	.50	199,680	April	1889	1.00
39	‡Cons. Cal. & Va., s. g	Nev.	21,600,000	216,000	100	216,000	Dec.	1892	.50	3,682,800	Aug.	1891	.50
40	Contention, s.	Ariz.	12,500,000	250,000	50					2,637,500	Aug.	1892	.20
41	Cook's Peak, s.	N. M.	2,000,000	200,000	10					119,532	Nov.	1892	.05
42	‖Cop. Queen Con., c.	Ariz.	2,000,000	200,000	10					1,610,000	Feb.	1894	.25
43	Coptis	Nev.	10,000,000	100,000	100					67,000	July	1892	.12
44	Cortes, s.	Nev.	1,500,000	300,000	05	*				687,000	Mar.	1892	.50
45	Crescent, s. l. g.	Utah	15,000,000	600,000	25	60,000	Oct	1892	.10	238,000	Oct.	1888	.03
46	Crown Point, g. s.	Nev.	10,000,000	100,000	100	2,750,000	June	893	.25	11,898,000	Jan.	1875	.00
47	Daly, s. l	Utah	3,000,000	150,000	20					2,850,000	May	1893	.25
48	†Deadwood-Terra, g.	Dak.	5,000,000	200,000	25	*				1,140,000	Sept	1892	.05
49	DeLamar, g s	Idaho	2,000,000	400,000	25					1,150,000	Jan	1894	25
50	Derbee B. Grav., g.	Cal.	10,000,000	100,000	100	100,000	Sept.	1892	.10	265,000	Mar	1894	.05
51	Dexter, g. s	Nev.	1,000,000	100,000	10					105,000	July	1893	.25
52	Elkhorn, s.	Mont.	1,000,000	200,000	5	*				1,261,000	Mar.	1894	.18
53	Enterprise, s.	Colo.	2,500,000	500,000	5	*				850,000	June	1893	.25
54	Eureka Con., s. l. g.	Nev.	1,000,000	50,000	100	550,000	June	1889	.50	5,112,500	Jan	1892	.25
55	Evening Star, s. l.	Colo.	500,000	50,000	10	*				1,437,500	Dec.	1889	.25
56	Father de Smet, g.	Dak.	10,000,000	100,000	100	200,000	Nov.	1878	1.00	1,125,000	Dec.	1885	.20
57	Franklin, c.	Mich.	1,000,000	40,000	25	220,000	June	1871		1,24[illegible],00	Dec.	1893	2.00
58	Glengarry	Mont.	1,000,000	100,000	10					10,000	June	1891	.10
59	Golden Reward	S.Dak	1,250,000	250,000	5					85,000	April	1893	.02
60	Gould & Curry, s. g.	Nev.	10,800,000	108,000	100	4,688,400	Oct.	1893	.10	3,826,800	Oct.	1870	10.00
61	Grand Prize, s.	Nev.	10,000,000	100,000	100	785,000	Jan.	1890	[illegible]	495,000	Mar.	1884	.25
62	Granite Mountain, s.	Mont.	10,000,000	400,000	25					12,120,000	July.	1892	.20
63	Great Western, l. q.	Cal.	5,000,000	50,000	100					388,366	Nov.	1893	.25
64	Hale & Norcross, g. s.	Nev.	11,200,000	112,000	100	5,646,800	June	1893	.50	1,822,000	Aug	1888	.50
65	Hecla Con., s. g. l. c.	Mont.	1,500,000	30,000	50					2,055,000	Sept.	1893	.50
66	Hel'a Mg. & Red, s. l. g.	Mont.	3,315,000	663,000	5	*				197,970	July.	1886	.06
67	Helena & Frisco, s. l.	Idaho	2,500,000	500,000	5					170,000	July.	891	.02
68	Helena & Victor	Mont.	1,000,000	200,000	5					80,000	May.	1892	.05
69	¶Holmes, s.	Nev.	10,000,000	100,000	100	345,000	Mar.	1890	.25	75,000	Apr.	1892	.25
70	Homestake, g.	Dak.	12,500,000	125,000	100	200,000	July.	1878	1.00	5,137,700	Mar.	1894	.15
71	Hope, s.	Mont.	1,000,000	100,000	10	*				533,[illegible]	Mar.	1894	.25
72	Horn-Silver, s. l.	Utah	10,000,000	400,000	25	*				4,930,000	Mar	1894	.12½
73	Idaho, g.	Cal.	310,000	3,100	100					5,489,000	Sept.	1893	2.50
74	Illinois, s.	N. M.	100,000	100,000	1	*				45,000	April	1889	.20
75	Iron Mountain, s.	Mont.	5,000,000	500,000	10	*				245,000	July.	1893	.03
76	Iron-Silver, s. l.	Colo.	10,000,000	500,000	20	*				2,500,000	April	1889	.20
77	Jackson, g. s.	Nev.	5,000,000	50,000	100	247,500	Mar.	1893	.20	60,000	Jan.	1891	.10
78	Kearsarge, c.	Mich.	1,000,000	40,000	25	190,000	Oct.	1887	1.00	80,000	Jan.	1890	2.00
79	Kennedy	Cal.	10,000,000	100,000	100					1,072,000	Dec.	1893	.43
80	Kentuck, s. g.	Nev.	3,000,000	30,000	100	454,180	Oct.	1891	.15	1,350,000	Dec.	1886	.10
81	Leadville Con., s. l.	Colo.	4,000,000	400,000	10	*				316,000	Feb.	1892	.03
82	Lexington, g. s.	Mont.	4,000,000	40,000	100	*				652,200	July.	1892	[illegible]
83	Little Chief, s. l.	Colo.	10,000,000	200,000	50	*				820,000	Dec.	1890	.05
84	Maid of Erin	Colo.	3,000,000	600,000	5					708,900	April	1893	.25
85	Mammoth, s. l. c.	Utah	10,000,000	400,000	50	110,000		1882	.25	1,040,000	Dec.	1891	.10
86	Maxfield	Utah	3,000,000	300,000	10					117,000	April	1892	.03
87	Mayflower, d. gravel	Cal.	1,200,000	60,000	20					128,000	Nov	1893	.10
88	May Mazeppa, s. l.	Colo.	1,000,000	100,000	1					205,000	Oct.	1891	.03¾
89	Minas Prietas, g. s.	Mex.	1,000,000	100,000	10	*				350,000	Dec.	1890	.50
90	Minnesota, c.	Mich.	1,000,000	40,000	25	420,000	April	1886	1.00	1,820,000	Mar.	1876	
91	Minnesota Iron, i.	Minn.	16,500,000	165,000	100					2,745,000	April	1893	1.50
92	Mollie Gibson, s.	Colo.	5,000,000	1,000,000	5	*				3,930,000	Dec.	1893	.05
93	Monitor, g.	S.Dak	[illegible]	250,000	10					45,000	Oct.	1890	.03
94	Mono, g.	Cal.	5,000,000	50,000	100	797,500	Feb.	1893	.25	12,500	Mar	1886	.25
95	Montana, Lt., g. s.	Mont.	3,300,000	660,000	5	*				2,619,075	June.	1891	12½
96	Morning Star, s. l.	Colo.	1,000,000	100,000	10					1,025,000	Dec.	1891	.25
97	Morning Star Drift, g	Cal.	240,000	2,400	100					14 ,600	April	1893	3.00
98	Moulton, s. g.	Mont.	2,000,000	400,000	5	*				410,000	Nov.	1892	.07½
99	Mt. Diablo, s.	Nev.	5,000,000	50,000	100	137,500	June	1880	2.00	225,000	Nov	1893	.30
100	Napa, q.	Cal.	700,000	100,000	7					62[illegible],000	April	1894	.10
101	Navajo, g. s.	Nev.	10,000,000	100,000	100	538,714	Sept.	1893	.10	226,111	April	1889	.10
102	New Guston, s.	Colo.	550,000	110,000	5					1,877,500	April	1892	.75
103	North Banner Con	Cal.	1,000,000	100,000	10					20,000	July.	1891	.05
104	North Commonw'th	Nev.	10,000,000	100,000	10	90,000	Jan.	1893	.10	25,000	June.	1891	.25
105	N. Hoover Hill, g. s.	N. C.	300,000	120,000	2½	*				30,000	Dec.	1885	.06¼
106	North Belle Isle, s.	Nev.	10,000,000	100,000	100	513,[illegible]75	April	1893	.10	230,000	May.	1888	.50
107	North Star, g.	Cal.	1,000,000	100,000	10	20,000		1885	.02	450,000	June	1893	.50
108	Omaha Cons., g.	Cal.	2,400,000	24,000	100					30,000	May.	1892	.15
109	Ontario, s. l.	Utah	15,000,000	150,000	100					13,175,000	Oct.	1892	.50
110	Ophir, g. s.	Nev.	10,000,000	100,000	100	4,391,040	July.	1893	.25	1,595,800	Jan.	1880	1.00
111	Original, s. c.	Mont.	1,500,000	60,000	25	*				138,000	Jan.	1889	.05
112	Oro, s. l. g.	Colo.	500,000	100,000	5					95,000	July.	1890	.20
113	Osceola, c.	Mich.	1,250,000	50,000	25	480,000	April	1876	1.60	1,847,500	Dec.	1893	1.00
115	Pacific Coast, b.	Cal.	1,500,000	15,000	100					422,500	July.	1893	1.00
115	Parrot, c.	Mont.	1,800,000	180,000	10					1,569,000	June	1893	.10
116	Petro	Utah.	10,000,000	10,025	100					17,500	July.	1891	.75
117	Plumas Eureka, g.	Cal.	1,406,250	140,600	10					2,696,295	Oct.	1893	.18
118	Plymouth Con., g.	Cal.	5,000,000	100,000	50	*				2,280,000	Feb.	1888	.40
119	Poorman, g. s.	Idaho	375,000	300,000	1.25	*				68,260	Sept.	1892	
120	Quicksilver, pref., q.	Cal.	4,300,000	43,000	100					1,823,911	June	1891	1.25
121	" com., q.	Cal.	5,700,000	57,000	100					643,867	July	1882	.40
122	Quincy, c.	Mich.	1,250,000	50,000	25	200,000	Dec.	1862		6,670,000	Aug.	1892	3.00
123	Red Cloud	Idaho	1,000,000	200,000	5					153,000	Dec.	1892	.10
124	Reed National, s. g.	Colo.	500,000	500,000	1	*				50,000	Dec.	1890	.01
125	Retriever, l.	S.Dak	1,250,000	250,000	5					20,000	Aug.	1891	.03
126	Rialto, g.	Colo.	300,000	300,000	1	*				50,250	April	1892	.01½
127	Richmond, s. l.	Nev.	1,350,000	54,000	25	*				4,359,887	Oct.	1893	.25
128	Rico-Aspen	Colo.	5,000,000	1,000,000	5					125,000	Mar.	1894	.02½
129	Ridge, c.	Mich.	1,250,000	50,000	25	219,939	Mar.	1886	50	99,785	Feb.	1880	.50
130	Robinson Con., s. l.	Colo.	10,000,000	200,000	50	*				585,000	Mar	1886	.05
131	Savage, s.	Nev.	11,200,000	112,000	100	6,966,000	June	1893	.25	4,460,000	June	1869	3.00
132	Sierra Buttes, g.	Cal.	2,225,000	122,500	10					1,559,933	Oct.	1893	.12½
133	Sierra Nevada, s. g.	Nev.	10,000,000	100,000	100	6,521,910	Aug	1893	.20	102,000	Jan.	1871	1.00
134	Silver Cord, s. l. g.	Colo.	4,500,000	450,000	10					265,000	April	1889	.10
135	Silver King, s.	Ariz.	10,000,000	100,000	100	97,479	Aug.	1892	.25	1,950,000	July	1887	.25
136	Silver Mg. of L. V., s. l.	N. M.	500,009	500,000	1					300,000	Dec.	1891	4.05
137	Small Hopes Con., s.	Colo.	5,000,000	250,000	20	*				3,225,000	Oct.	1893	.10
138	Standard, g. s.	Cal.	10,000,000	100,000	100	100,000	June	1890	.50	3,721,159	Mar.	1894	.10
139	Swansea, g. s.	Colo.	600,000	60,000	10					39,000	Sept.	1893	.10
140	Tamarack, c.	Mich.	1,250,000	50,000	25	520,000	April	1885	8.00	[illegible],670,000	Dec.	1893	4.00
141	Tombstone, g. s. l.	Ariz	12,500,000	500,000	25	*				1,250,000	April	1882	.10
142	Trinity Riv'r Hydr., g	Colo.	500,000	500,000	1	*				15,000	July	1893	.00½
143	United Verde, c.	Ariz.	3,000,000	300,000	10	*				207,500	Jan.	1892	.10
144	Victor, g	Colo.	1,000,000	200,000	5					120,000	Dec.	1893	.07½
145	Ward Con., s.	Colo.	2,000,000	200,000	10					20,000	Dec.	1889	.05
146	W. Y. O. D.	Cal.	6[illegible],000	30,000	2	22,500	May.	189	.10	48,000	Nov.	1893	.10
147	Yankee Girl, s.	Colo.	1,300,000	260,000	5					1,405,000	Sept.	1893	1.50
148	Yellow Jacket, g. s.	Nev.	12,000,000	120,000	100	5,556,000	July.	1893	.2[illegible]	2,184,000	Aug.	1871	1.50

NON-DIVIDEND-PAYING MINES.

	Name and Location of Company.		Capital Stock.	Shares. No.	Par	Assessments. Total levied	Date and am't of last		
1	Alliance, s. g.	Utah	$100,000	100,000	$1	$120,000	Feb.	1891	.20
2	Allouez, c.	Mich.	2,000,000	80,000	25	1,424,93[illegible]	Oct.	1891	.50
3	Alpha Con., g. s.	Nev.	3,000,000	30,000	100	209,000	Sept.	1892	[illegible]
4	Alta, s.	Nev.	10,080,000	100,800	100	3,869,88[illegible]	Jan	1892	.10
5	American Flag, s.	Colo.	1,250,000	125,000	1	[illegible]	June	189[illegible]	
6	Anchor, s. l. g.	Utah.	3,000,000	150,000	5	560,000	July.	1893	[illegible]
7	Barcelona, g.	Nev.	5,000,000	200,000	5	*			
8	Belmont, g.	Cal.	500,000	500,000	100	*			
9	Belmont, s.	Nev.	5,000,000	50,000	100	735,000	April	188[illegible]	.10
10	Best & Belcher, s. g.	Nev.	10,080,000	100,800	10	2,405,27[illegible]	Aug.	189[illegible]	.25
11	Black Oak, g.	Cal.	3,000,000	300,000	100	*			
12	Brownlow, g.	Colo.	250,000	250,000	5				
13	Brunswick, g.	Cal.	2,000,000	400,000	2				
14	Bullion, s. g.	Nev.	10,000,000	100,000	100	2,890,000	Aug.	1892	.25
15	Butte & Boston, c. s.	Mont.	5,000,000	200,000	10				
16	Butte Queen, g.	Cal.	1,000,000	100,000	1	6,000	Jan.	1892	.04
17	Calaveras, g.	Cal.	500,000	500,000	5				
18	Calaveras Con., g.	Cal.	800,000	160,000	10				
19	California, g.	Cal.	1,000,000	100,000	5	9,000	Mar.	1892	.03
20	California Con. l. q.	Cal.	2,250,000	450,000	10				
21	Challenge Con., g. s.	Nev.	5,000,000	50,000	10				
22	Chollar, s. g.	Nev.	11,200,000	112,000	2	1,820,000	May.	189[illegible]	50
23	Colchis, s. g.	N. M.	500,000	150,000	5				
24	Colorado, s.	Colo.	1,625,000	325,000	1				
25	Comstock, s.	Utah.	1,250,000	250,000	100				
26	Comstock Tun.	Nev.	10,000,000	100,000	100	35,000	Mar.	1887	.10
27	Con. Imperial, g. s	Nev.	5,000,000	50,000	50	2,062,500	Jan.	1892	.25
28	Con. New York, s. g.	Nev.	5,000,000	100,000	100	110,000	Mar.	1892	.10
29	Con. Pacific, g.	Cal.	6,000,000	60,000	10	198,000	June	1890	.10
30	Crescent, s. l.	Colo.	3,000,000	300,000	100	*			
31	Crocker, s.	Ariz.	10,000,000	100,000	1	165,000	Aug	189[illegible]	.05
32	Crowell, g.	N. C.	500,000	500,000					
33	Dahlonega, g	Ga.	250,000	250,000	10	*			
34	Decatur, s	Colo.	1,500,000	300,000					
35	Denver City, s.	Colo.	5,000,000	500,000	11	*			
36	Denver Gold, g.	Colo.	300,000	60,000	5				
37	Dickens-Custer, s.	Idaho	2,100,000	420,000	5				
38	Durango, g.	Colo.	500,000	500,000	1	*			
39	El Dorado, g.	Cal.	1,000,000	250,000	4	*			
40	Emma, s	Utah.	625,000	500,000	125				
41	Emmons, s. l.	Colo.	2,000,000	2,000,000	1				
42	Empire, s.	Utah.	10,000,000	100,000	100				
43	Eureka Tunnel, s. l.	Nev.	10,000,000	100,000	100	*			
44	Exchequer, s. g.	Nev.	10,000,000	100,000	100	940,000	Jan.	1892	.25
45	Found Treasure, g. s.	Nev.	10,000,000	100,000	100	130,500	Jan.	1892	.50
46	Gogebic I. Syn., i.	Wis.	5,600,000	200,000	25				
47	Gold Cup, s.	Colo.	500,000	500,000	1	*			
48	Golden Era, s.	Mont.	1,000,000	200,000	10	*			
49	Gold Flat, g.	Cal.	1,000,000	100,000	10	5,000	Mar.	1892	.05
50	Gold Rock, g.	Cal.	1,000,000	500,000	2				
51	Golden Feather Co., g	Cal.	900,000	180,000	5				
52	Goodyear g. s. l	Mont.	1,000,000	200,000	5	13,000	Feb.	1852	.01
53	Grand Duke, s.	Colo.	800,000	80,000	10				
54	Gregory Con., g.	Mont.	3,000,000	300,000	10				
55	Harlem M. & M. Co., g.	Cal.	1,000,000	200,000	5				
56	Hartery Con., g.	Cal.	1,000,000	100,000	10	22,000	Oct.	1890	.05
57	Hartshorn, g s. l.	S.Dak	1,250,000	250,000	5	8,750	Sept.	1891	.00½
58	Head Cent. & Tr., s. g	Ariz.	10,000,000	100,000	100	16,981	Mar.	1892	.03
59	Hector, g.	Cal.	1,500,000	300,000	5	45,000	Jan.	1889	.15
60	Himalaya, g. s l.	Utah.	1,800,000	80,000	10	12,800	Oct.	1892	.00½
61	Holywood	Cal.	200,000	100,000	2				
62	Huron, c.	Mich.	1,000,000	40,000	25	280,000	May.	1887	3.00
63	Idaho, g. s	Idaho	1,250,000	250,000	5				
64	Ingalls, g	Colo.	100,000	20,000	5				
65	Ironton, i.	Wis.	1,000,000	40,000	25				
66	Iroquois, c.	Mich.	1,250,000	50,000	25				
67	Kentuck Con	Nev.	10,500,000	105,000	00	57,750	July	1892	.10
68	Julia Con., g. s.	Nev.	11,000,000	110,000	100	1,463,000	Jan.	1888	.10
69	Justice, g. s. c.	Colo.	500,000	500,000	1	*			
70	Lacrosse, g.	Colo.	1,000,000	100,000	10	*			
71	Little Josephine, s.	Colo.	250,000	50,000	5				
72	Lone Star Cons., g.	Cal.	500,000	500,000	1	10,000	April	1892	.00½
73	Madeleine, g. s. l.	Colo.	750,000	50,000	1	4,500	Feb.	1892	.00½
74	Mammoth Gold, g.	Ariz.	2,500,000	500,000	5	*			
75	Mayflower Gravel, g.	Cal.	1,000,000	100,000	10	*			
76	Mexican, g. s.	Nev.	[illegible]	100,000	100	2,917,560	Oct.	1892	.50
77	Michigan, g s	Mich.	2,500,000	100,000	25	40,000	Mar.	1892	
78	Mike & Starr, s. c.	Colo.	1,000,000	200,000	5	*			
79	Milwaukee, s.	Mont.	500,000	500,000	1	*			
80	Modoc Chief, l. s. g.	Idaho	1,000,000	200,000	5	5,000	Jan.	1892	.00½
81	Monitor, g.	Colo.	100,000	100,000	1	12,500	May.	1891	.01
82	Montreal, g. s. l.	Utah.	750,000	150,000	5	4,500	Feb.	1892	.00½
83	Mutual Mg. & Sm.	W'sh	100,000	100,000	1	*			
84	Neath, g.	Colo.	1,000,000	100,000	10				
85	Nelson	Cal.	50,000	10,000	5				
86	Nevada Queen, s.	Nev.	10,000,000	100,000	100	200,000	Oct.	1889	.25
87	New Gold Hill	N. C.	1,750,000	350,000	5				
88	New Pittsburg, s. l.	Colo.	2,000,000	200,000	10	*			
89	North Standard, g.	Cal.	10,000,000	100,000	100	20,000	Nov.		
90	Occidental Con., g. s		10,000,000	100,000	100	245,000	April	1892	.25
91	Oneida Chief, g.	Cal.	500,000	125,000	100	*			
92	Oriental & Miller, s.	Nev.	10,000,000	400,000	100				
93	Original Keystone, s.	Nev.	10,000,000	100,000	100	250,000	Mar.	1892	.10
94	Osceola, g.	Nev.	5,000,000	500,000	10	*			
95	Overman, g. s.	Nev.	11,520,000	115,200	100	4,001,840	May.	1892	.10
96	Pay Rock, s.	Colo.	1,000,000	200,000	5				
97	Peer, s.	Ariz.	10,000,000	100,000	100	190,000	Feb.	1892	.10
98	Peerless, s.	Ariz.	10,000,000	100,000	100	405,000	Oct.	1890	.15
99	Pennsylva'a Cons., g	Cal.	5,150,000	515,000	10	36,050	Feb.	1892	.10
100	Phœnix, g.	Ariz.	500,000	500,000	1	*			
101	Phœnix Lead, s. l.	Colo.	100,000	100,000	1	*			
102	Pilgrim, g	Cal.	600,000	300,000	2	*			
103	Pioche M. & R., s. g. l.	Utah.	20,000,000	000,000	10				
104	Poorman, Ltd., s. l.	Idaho	250,000	50,000	5				
105	Potosi, s.	Nev.	11,200,000	112,000	100	1,573,000	Mar.	1890	.50
106	Proustite, s.	Idaho	250,000	250,000	1	*			
107	Puritan, s. g.	Colo.	1,500,000	150,000	10	*			
108	Quincy, c	Colo.	3,000,000	300,000	10				
109	Rainbow, g.	S.Dak	1,250,000	250,000	5	4,250	July.	1892	.00½
110	Rappahannock, g. s.	[illegible]	250,000	250,000	1	*			
111	Red Mountain, s.	Colo.	300,000	60,000	5				
112	Ropes, g. s.	Mich.	2,000,000	80,000	25	167,200	Feb.		50
113	Ruby & Dun., s. l. g.	Nev.	25,300	506	50	*			
114	Russell, g.	N. C.	1,500,000	300,000	5				
115	Sampson, g. s. l.	Utah.	10,000,000	100,000	100	288,15[illegible]	July	1888	1.08
116	Silver Age, s. l. g.	Colo.	2,000,000	200,000	10	*			
117	Silver Bell, s.	Ariz.	850,000	170,000	5				
118	Silver King, s.	Cal.	2,000,000	400,000	5				
119	Silver Queen, c.	Ariz.	5,[illegible]00,000	200,000	25	*			
120	Silverton, s	Colo.	300,000	60,000	5				
121	Siskiyou Con., l.	Cal.	2,000,000	200,000	10	13,000	May.	1892	.01½
122	South Bulwer, g	Cal.	10,000,000	100,000	100	100,000	May.	1881	.25
123	South Hite, g.	Cal.	10,000,000	100,000	100	195,000	Jan.	1883	.05
124	Stanislaus, g.	Cal.	2,000,000	200,000	10				
125	St. Kevin, s. g.	Colo.	100,000	100,000	1	*			
126	St. Louis & Mex., s.	Mex.	000,000	500,000	10	*			
127	St. Louis & St. Elmo.	Colo.	,000,000	200,000	10				
128	St. L. & Sonora, g. s.	Ariz.	3,000,000	300,000	10	*			
129	Stem-winder, l. s.	Idaho	,500,000	500,000	1				
130	Sunday Lake, i.	Mich.	250,000	50,000	25				
131	Sullivan Con., g.	Dak.	600,000	200,000	3	*			
132	Sylvanite, s.	Colo.	5,000,000	500,000	10	*			
133	Taylor-Plumas, g.	Cal.	425,000	65,000	5	3,575	Mar.	1892	.01½
134	Telegraph, g. s.	Cal.	3[illegible]5,000	65,000	5	3,575	Mar.	1892	.01½
135	Telegraph, g. s.	Mex.	100,000	100,000	1	70,000	Feb.	1892	.10
136	Teresa, g. s	Cal.	1,000,000	200,000	5	10,000	Feb.	188[illegible]	10
137	Tioga Con., g.	Nev.	10,000,000	100,000	10	295,000	May.	188[illegible]	25
138	Tornado Con., g. s.	Nev.	100,000	100,000	1	*			
139	Tuscarora, s.	Nev.	10,000,000	500,000	20	385,000	Jan	1892	25
140	Union Con., g. s.	Nev.	10,000,000	100,000	100	370,000	June	1892	25
141	Utah, s.	Nev.	10,000,000	100,000	100	245,000	Aug.	189	.25
142	Ute & Ulay, s. l.	Colo.	1,000,000	500,000	2	1,500	Mar.	1894	001
143	Valley, g	Cal.	575,000	460,000	125				
144	Washington, c.	Mich.	1,000,000	40,000	5				
145	West Argentine, s.	Colo.	750,000	150,000	5				
146	West Granite Mt., s.	Mont.	500,000	100,000	5				
147	Whale, s	Mont.	5,000,000	500,000	10	*			
148	Wood River, g.	Idaho	2,000,000	200,000	10	3,000	Aug.	1891	.00½
149	Yuma, c. s. g	Ariz.	10,000,000	400,000	2				

G., Gold. S., Silver. L., Lead. C., Copper. B., Borax. * Non-assessable. † The Deadwood previously paid $275,000 in eleven dividends and the Terra $75,000. ‡ Previous to the consolidation in August, 1884, the California had paid $31,320,000 in dividends, and the Cons. Virginia $12,390,000. ‖ Previous to the consolidation of the Copper Queen with the Atlanta August, 1885, the Copper Queen had paid $1,350,000 in dividends. ¶ Previous to this company's acquiring Northern Belle, that mine paid $2,400,000 in dividends against $425,000 in assessments.

COAL AND COAL RAILROAD STOCKS.

NAMES OF STOCKS.	March 24.		March 26.		March 27.		March 28.		March 29.		March 30.		Sales.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Am. Coal	.....	.....	.....	.....	79	78½	79	78⅝	78⅝	.....	78½	....	1,759
Balt. & Ohio	78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	....	.....
do pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Buff., R. & P	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	100
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Cambria Iron	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Ches. & Ohio	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
do. 1st pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Col. C. & I	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Col. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Colorado Fuel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Col., H. V. & Tol	.....	.....	20¾	.....	20¼	.....	.....	.....	.....	.....	20¾	....	565
do. pfd	65⅝	.....	.....	.....	.....	.....	66	.....	.....	.....	.....	....	110
Col. & H. Coal	.....	.....	99⅝	....	8¾	.....	9¼	8⅝	9⅛	9	9⅜	9¼	1,250
do. pfd	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cons. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Del. & Hud. C	137⅜	137¼	137⅝	.....	137	136¾	139¾	136½	139½	139	139¾	138	5,003
Del., L. & West	.....	.....	165⅝	.....	.....	.....	165	.....	.....	.....	.....	..	23
Hunt. & B. Top	.....	.....	.....	.....	.....	.....	32	.....	.....	.....	.....	..	50
do pref	.....	.....	499⅜	.....	.....	.....	.....	49¾	49½	.....	.....	..	32
Lake Erie & West	16	.....	.....	.....	17⅜	.....	15⅜	15⅛	15⅝	.....	17⅜	15⅜	4,100
do. pref	.....	.....	.....	.....	68	.....	.....	.....	68	.....	69	68	1,000
Lehigh C. & N	54⅜	.....	54⅜	54⅛	54⅞	54⅜	54⅝	.....	54⅛	.....	.....	..	238
Lehigh Valley	4 ⅛	4⅛	40⅝	....	40⅝	40⅜	40⅜	40⅛	40⅝	40⅛	.....	..	781
Maryland Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Morris & Essex	.....	.....	153¾	.....	.....	.....	.....	.....	153	.....	.....	..	160
New Cent. Coal	.....	.....	85½	.....	.....	.....	.....	.....	.....	.....	.....	..	200
N. J. Central	115	.....	116	....	116¼	115⅜	115	114⅜	115	....	115¾	....	717
N. Y., L. & W	.....	.....	.....	.....	.....	.....	114¾	.....	.....	.....	.....	..	23
N. Y., L. E. & W	17⅜	.....	17⅝	....	18⅛	17⅞	18⅝	18⅛	18⅛	17⅞	18⅝	17⅝	8,535
do. pref	.....	.....	.....	.....	.....	.....	88½	.....	88½	.....	.....	..	813
N. Y., Susq. & W	16⅜	16¼	16½	16⅜	16½	16	16	.....	16⅜	.....	16	.....	1,366
do pref	.....	.....	45½	45¼	45	44	44¼	44⅜	44¼	44¼	44	.....	2,260
N. & West	.....	.....	.....	.....	.....	.....	.....	.....	53¼	.....	.....	..	100
do. pref	.....	.....	.....	.....	21¾	21½	23	22⅜	.....	.....	.....	..	250
Penn. Coal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Penn. R. R	51⅜	51	51¾	51	51⅝	51	51⅝	.....	51¾	51⅜	.....	..	958
Phil. & Reading	21⅝	21¼	21⅝	20⅝	21	20½	21⅜	19⅞	21⅜	20⅜	21⅞	21	83,930
Penn. C. & I	19	18⅜	19¼	18⅜	18¾	18⅜	18⅝	18⅝	.....	.....	19⅜	18¾	5,030
do. pref	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	..	.....
Wheel. & L. E	13¼	.....	13¼	.....	13¼	.....	13	.....	13½	.....	13¾	12¾	800
do. pref	49⅝	48¾	49⅝	.....	49½	48½	49¾	....	49⅝	.....	49⅝	.....	1,100

Total shares sold, 124,545.

INDUSTRIAL AND TRUST STOCKS.

NAME OF STOCKS.	Mar. 24.		Mar. 26.		Mar. 27.		Mar. 28.		Mar. 29.		Mar. 30.		SALES.
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	
Adams Express	.....	.....	132	130	.....	.....	.....	.....	.....	.....	.....	.....	88
Am. Cotton Oil	29¾	.....	30⅛	30	30⅜	29¾	31½	31	32	30¾	32½	30½	11,451
do. pref	.....	.....	.....	.....	69¾	69¼	71⅜	70	71⅜	71¼	73½	71⅜	3,061
Am. Dist. Tel	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Am. Express	114½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
Am. Sugar Ref	90	89¼	9 0⅜	89	90⅜	90	90	88⅞	89⅜	88⅞	9 0⅜	88⅜	62,465
do. pref	88⅝	88¼	88¼	88	88	.....	.....	.....	89½	88	88¼	88¾	1,423
Edison E. Ill. Co	.....	.....	.....	.....	99	98¾	99½	.....	.....	.....	.....	.....	145
Edison Gen. El	42¼	.....	43	42¼	42¾	42⅜	42⅝	42⅜	42⅝	42	42¾	41¾	9,752
Nat. Cord. Co	.....	.....	20¾	.....	20⅝	20	20	.....	20⅝	20	20	.....	1,703
do. pref	.....	.....	.....	.....	43	.....	.....	.....	.....	.....	40⅜	.....	210
Nat. Lead Co	36	35⅜	36¼	35⅞	37⅜	36¼	38⅜	37	38⅜	37⅝	39	37¼	31,401
do. pref	79	78⅝	79⅜	.....	80⅜	79⅜	83⅞	79⅜	84½	82¾	84⅜	82¼	10,197
Nat. Linseed Oil	.....	.....	20	.....	.....	.....	21	20¾	.....	.....	.....	.....	366
U. S. Express	54	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
U. S. Rubber	40	.....	40¼	40	39¾	.....	40⅝	.....	.....	.....	40¼	.....	655
do. pref	87	.....	.....	.....	86	.....	87½	.....	87¾	.....	.....	.....	382
Wells, Fargo Ex	.....	.....	125	.....	.....	.....	.....	.....	.....	.....	.....	.....	135
Western Union	85¼	85	85⅝	85⅛	85⅜	85	85⅜	85⅝	85⅛	84¾	85	84⅛	17,899

Total shares sold, 151,944.

CALIFORNIA.

San Francisco.

NAMES OF STOCKS.	CLOSING QUOTATIONS.					
	Mar. 23	Mar. 24.	Mar. 26.	Mar. 27.	Mar. 28.	Mar. 29.
Alpha	.....	.....	.....	.....	.....	.....
Alta	.08	.11	.09	.10	.19	.10
Belcher	.....	.....	.....	.....	.....	.....
Belle Isle	.....	.....	.....	.....	.....	.....
B. & Belch	1.40	1.35	1.30	1.25	1.15	1.15
Bodie	.10	.10	.10	.10	.10	.10
Bulwer	.05	.05	.05	.05	.05	.05
Challar	.39	.37	.33	.25	.20	.20
Com'w'lth	.....	.....	.....	.....	.....	.....
Con. C. & V	2.70	2.70	2.60	2.40	2.30	2.20
Con. Pac	.....	.....	.....	.....	.....	.....
Crown Pt	.44	.42	.40	.40	.35	.37
Del Monte	.....	.....	.....	.....	.....	.....
E'reka Con	.....	.....	.....	.....	.....	.....
Gld & Cy	.67	.67	.60	.60	.55	.55
Hale & N	.51	.50	.50	.43	.42	.41
M. White	.....	.....	.....	.....	.....	.....
Mexican	1.35	1.35	1.30	1.25	1.25	1.15
Mono	.15	.15	.15	.08	.05	.05
Mt. Diablo	.....	.....	.....	.....	.....	.....
Navajo	.....	.....	.....	.....	.....	.....
Nev. Qu'n	.....	.....	.....	.....	.....	.....
N. B'lleisle	.....	.....	.....	.....	.....	.....
N. Co'w'th	.....	.....	.....	.....	.....	.....
Ophir	2.40	2.40	2.35	2.30	2.30	2.25
Potosi	.97	.88	.88	.75	.70	.69
Savage	.36	.37	.37	.31	.27	.27
Sierra Nev	1.10	1.05	1.00	.95	.90	.89
Uni'n Con	.78	.74	.66	.65	.63	.63
Utah	.10	.05	.20	.05	.03	.03
Yel. Jack	.61	.60	.55	.55	.52	.54

COLORADO.

Aspen. March 29.

	Price.
Argentum-Juniata	$0.52
Aspen Contact	.45
Aspen Deep Mining	.....
Best Friend	.....
B.-Metallic	.03
Bushwacker	.09½
Delia S.	.....
Gold Valley Placer	.....
Little Annie	.04
Mollie Gibson	1 17½
Pontiac	.03
Smuggler	.65
St. Joe & Mineral Farm	.05½
U. S. Paymaster	—

Colorado Springs. Mar. 23.

Prices and sales for the week ending March 23d, 1894:

	High.	Low.	Sales.
Cripple Creek (gold):			
Aola	.02¼	.02⅛	6,000
Alamo	.01⅝	.01½	6,100
Anaconda Gold	.33	.31½	9,200
Antlers-Park-R'g'nt	.04¼	.04¼	5,000
Argentum Juanita	.31	.39	..
Bankers'	.05½	.05	15,000
Blue Bell	.02	.01⅞	6,000
Calumet	.02⅛	.02¼	77,000
Columbine	.02	.01⅞	2,000
Cripple Creek Con	.02¾	.02½	139 600
Creede & Cripple C	.01¼	.01⅛	21,500
Free Coinage	.....	.....	500
Golden Dale	5.50	5.00	3,000
Goldstone	8 50	7.50	59,500
Gould	.05	.04⅞	22,000
Golden Eagle	15.00	14.50	55,300
Granite Hill	9.50	8.50	22,500
Isabella	.21	.19½	6,000
Jack Pot	.02	.01⅞	19,500
Lottie Gibson	.01½	.01¼	11,000
Lemhi (gold placer), Idaho	.27½	.27	300
Mollie Gibson	1.25	1.21½	700
Moose	.65	.60	200
Mt. Rosa	.04¼	.03¾	24,500
Mutual	.02	.02	4,000
Ophir	.04¼	.04¼	1.000
Pharmacist	.11½	.10¾	15,900
Ranona	.....	.....	6,250
Specimen	.....	.....	500
Star of the West	5.00	3.00	70,000
Summit	.16½	.16	1,000
Union	.09	.08¾	8,000
Work	.03¾	.03½	7,000
Total sales			636,120

Denver.

Prices and sales for six days ending March 26, 1894:

	High.	Low.	Sales.
Alamo	.01½	.01¼	8,200
Anaconda	.33½	.30½	6,300
Amity	.01	.....	800
Adele	.07¾	.07½	2,000
Bankers	.05½	.05	20,000
Bangkok	.05	.....	2,100
Big Six	.05	.03½	1,100
Calumet	.02⅛	.02	27,0
Cr. & C. C.	.01¼	.01⅛	46,000
Diamond B	.00½	.....	500
Golden D	.00¾	.00½	38,500
Gold Standard	.04½	.03½	8,000
Golden T	.06	.....	100
Granite H	.01	.....	3,500
Isabella	.22	.19	7,300
Jack Pot	.02	.01¾	43,100
Justice	.01¾	.....	600
Lottie Gibson	.01¾	.01⅛	27.500
Mollie Gibson	1.25	1 20	3 100
Pharmacist	.11	.10½	5,400
Queen B	.25½	.25½	500
Summit	.17	.....	4,800
Union Gold	.08¼	.....	2,000
Union P	.07½	.....	5,000
Work	.04	.03¾	62,500
World	.01⅝	.01¼	13,000

MARYLAND.

Baltimore. March 29.

COMPANY.	Bid.	Asked.
Atlantic Coal	....	$75.00
Balt. & N. C	....	0.10
Conrad Hill	....	.10
Cons. Coal	$0 30	...
Diamond Tunnel	....	14.00
George's Creek Coal	1.02	1 05
Howard C. & C.	1.10	....
Lake Chrome	.01@.02	....
Silver Valley	.13	.30
Vernon Mining Co	.31@.33	.32@.35

MINNESOTA.

Duluth. March 26.

LISTED STOCKS.

	Par.	Bid.	Asked.
Biwabik M. Iron Co	100	$20.00	$21.00
Cincinnatt Iron Co	25	.25	.30
Clark Iron Co	100	....	.60
Great Northern Min. Co	100	2.75	3 50
Kanawha Iron Co	100	.10	.20
Keystone Iron Co	....	....	.40
Lake Superior Iron Co	25	....	2.50
Lincoln Iron Co	....	....	.50
Mesaba Moun. Iron Co	100	14.00	17 0
Minneapolis Iron Co	100	.02	.15
Mountain Iron Co	100	50.00	65.00
Shaw Iron Co	100	2.50	3.00
Security Land & Exp. Co.	10	10.00	15.00

UNLISTED STOCKS.

Adams Iron Co	10	$7.00	$9.00
Ashland Iron Co	25	....	40.00
Buckeye Iron Co	100	....	2.50
Buffalo Land & Exp. Co	1	....	.50
Chandler Iron Co	25	20.00	25.00
Charleston Iron Co	100	.15	.30
Cleveland Cliffs Iron Co	100	20.00	40.00
Chicago Iron Co	100	.20	.30
Detroit Iron Co	25	.01	.02
Elmira Land & Iron Co	100	.05	.25
Great Western Mining Co.	100	1.90	2.25
Homestead Iron Co	25	.00½	.02
Internat'l Development	10	....	22.50
Jackson Iron Co	25	....	60.00
Lake Supr. (Marquette)	25	20.00	27.00
McCaskill Mining Co	10	.01	.03
Mesaba C., L. & Ex. Co	10	....	6.00
Mesaba Chief Iron Co	100	1.75	2.00
Mesaba Iron Co	30	....	.20
Metropolitan L. & L. Co.	25	50.00	70.00
Northern Light Iron Co	100	....	.25
Ohio Mining Co	100	5.00	8.00
Ophir, gold	10	....	1.00
Penn. Iron & Steel Co	100	.04	.10
Pioneer Iron Co	25	....	1.00
Pittsburg & Lake A. Co.	100	110.00	125.00
Putnam Iron Co	100	....	.80

MONTANA.

Helena.

(Specially Reported by S. K. Davis.)

Stock quotations week ending March 21.

	Bid.	Asked.
Bald Butte (Mont.)	$3.00	$4 00
Benton Group (Neihart), Mont	....	.25
Combination (Phillipsb'g), Mont	....	.90
Helena & Victor, Mont	....	.25
Iron Mountain (Missoula), Mont	.35	.45
Pegan (Marysville), Mont	.15	.25
Poorman (Cœur d'Alene), Idaho	.85	1.00
Whitlach Union & MacIntyre	....	.25

PENNSYLVANIA.

Philadelphia. March 29.

	Bid.	Asked.
Cambria	....	$47.00
Edison E. Light Co	....	132.00
Penn. Salt	....	95.00
Penn. Steel	20.00	....
Washington, D. C., Gas	45.00	....
Westmoreland C	52.25	....

Pittsburg. March 28.

	Bid.	Asked.
Bridgewater Gas	$18	$15
Chartiers Valley Gas	13⅝	13⅞
Manufacturers' Gas	30	....
Nat. Gas Co. of W. Va	25	....
Olive Valley Gas	23	....
People's Nat. Gas	22	....
Penn Gas	....	11
Philadelphia Co	21¼	21⅜
Wheeling Gas	....	19
Fisher Oil	....	53
Tuna Oil	....	15
Chartiers Block Coal	35	....
N. Y. & Cleve. Gas Coal	....	48½
Mongahela, Nev	....	68
Lumber Mining Co	15	15½
Westinghouse Air Brake	128¼	129
Westinghouse Electric, 1st pref	48¼	....
Westinghouse Electric, 2d pref	32½	....

UTAH.

Salt Lake City.

(Special Report of James A. Pollock.)

	March 17. Bid.	Asked.
Alliance	....	$1.75
Anchor	$1.90	2.75
Centennial Eureka	22.00	26.00
Cleveland Con	0.20	0.50
Crescent	0.06	0.12
Daly	5.25	7 50
Dalton	0.00	0.01
Horn Silver	2.60	3.00
Mammoth	1.20	1.45
Mecars	....	0 75
Ontario	7.50	9 00
Silver Spar	....	1.00
Tetro	....	0.25
Utah	....	1.75

London Quotations.

	Mar. 21, 1894. Buyer. £ s. d.	Seller. £ s. d.
Alaska Treadwell, Alaska Ter	2 13 9	2 16 3
Almada & Tirito, Mex.	3	9
American Belle, Colo.	1 3	1 9
De Lamar, Idaho	1 0 6	1 1 6
Elkhorn, Mont	9 6	10 6
Emma, Utah	3	6
Golden Feather, Cal	7 0	7 6
Golden Gate, Cal	6 9	7 3
Golden Leaf, Mont. & N. M	6	1 0
Harqua Hala, Ariz	18 6	19 6
Holcomb Valley, Cal.	6	9
Idaho Exploring	9	1 0
Jay Hawk & Lone Pine Mont	6 0	7 0
Mesquital del Oro, Mex., P	10 0	1 0 0
Mesquital del Oro, Mex., D	2 6	7 6
New Guston, Colo	6 0	7 0
New Montana, Mont.	5 0	5 6
Palmarejo, Mex	1 6	1 9
Pinos Altos, Mex	2 0	2 6
Plumas Eureka, Cal	12 6	15 0
Poorman Con. Idaho	6 0	6 6
Rajah Gold, Can	1 0	2 0
Richmond Con., Nev.	7 0	9 0
Sierra Buttes, Cal	8 9	11 3
Springdale Gold, Colo.	2 9	3 3
United Mexican, Mex.	1 0	1 6

New York Mining Stocks.

(Latest quotations.)	March 30. Bid.	Asked.
Alice	$0.25	$0.35
Alta	.10	....
Best & Belcher	1.15	....
Bodie	0.10	....
Breece	0.10	.13
Brunswick	0.03	.06
Bulwer	0.05	....
Caledonia, B. H	....	0.55
Castle Creek	....	....
Challar	0.10	.65
Chrysolite	0.14	.18
Colo. Cent. Consol	....	.60
Comstock Tunnel	0.07	.09
Con. C. & Va	2.90	....
Crown Point	0.30	....
Deadwood	0.45	....
El Cristo	....	.15
Enterprise	0.25	.75
Father De Smet	0.11	.16
Gould & Curry	0.70	1.00
Hale & Nor	0.55	.80
Holyoke	....	.03
Horn Silver	2.50	2.90
Iron Silver	....	.25
Kingston & Pem	0.20	....
La Crosse	0.03	.06
Leadville	0.08	....
Little Chief	0.08	....
Mexican	1.40	....
Mono	0.05	....
Ophir	2.00	....
Phœnix Trust Co	0.10	0.13
Phœnix Con Gold	....	....
Plymouth Con	....	.65
Potosi	0.55	....
Savage	0.40	0.70
Sierra Nevada	0.30	....
Silver King	0.75	....
Union Cons	0.85	....
Utah	0.10	....
Yellow Jacket	0.60	....

Paris. March 16.

	Francs.
Helmez, Spain	665.00
Golden River, Cal	130.00
" " parts	30.00
Laurium, Greece	550.00
Lexington, Mont	42.50
" parts	1 00
Nickel, New Caledonia	550.00
Rio Tinto, Spain	366.25
" " oblig	507.50
" " "	501.20
Tharsis, Spain	125.00
Vieille-Montagna, Belgium	447.50

ASSESSMENTS.

COMPANY.	No.	Dlnqt. in office.	Day of sale.	Amt. per sh're
Andes, Nev	40	Apr. 10	Apr. 28	.25
Belcher, Nev	48	Apr. 17	May 8	.25
Bodie, Cal	17	Apr. 16	May 14	.15
Caledonia, S. Dak	18	Apr. 10	May 10	.50
Con. Cal. & Va., Nev	4	Apr. 10	Apr. 28	.50
Ea. Sierre, Nev	3	Apr. 20	May 11	.05
Eclipse, Cal	7	Mar. 12	Apr. 3	.02
Justice, Nev	56	Mar. 12	Apr. 2	.10
Overman, Nev	70	Apr. 10	Apr. 30	.10
Potosi, Nev	41	Apr. 16	May 2	.25
Savage, Nev	83	Apr. 9	Apr. 30	.25
Scorpion, Nev	5	Mar. 16	Apr. 6	.05
Siskiyou Con. G., Cal	8	Apr. 5	Apr. 27	.07
South Eureka, Nev	9	Mar. 19	Apr. 10	.01
Teresa, Mex	13	Mar. 23	Apr. 10	.05

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Obermayer Co.

Fly Wheels
Poole, R., & Son Co.

Forges
Foos Mfg. Co.

Founders
Poole, R., & Son Co.

Foundry Cranes
Obermayer Co.

Foundry Supplies
Obermayer Co.

Friction Clutches
Poole, R., & Son Co.

Furnaces
Hoskins, Wm.
Moore, S. L., & Son Co.
Pollock, W. B. & Co.
Sheffield Car Co.
(See Machinery.)

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

Gauges, Recording, Etc.
Allen, Chas. A.
Bristol Mfg. Co.
Everhardt, J. M.

Gearing
Poole, R., & Son Co.

Grain Elevators
Poole, R., & Son Co.

Grease, Graphite, Etc.
Dixon, Jos., Crucible Co.

Hangers
Poole, R., & Son Co.

Heavy Machinery
Poole, R., & Son Co.

Hopper Cocks
Mueller Mfg. Co

Hose, Rubber, Etc.
Allen, Chas. A.
New York Belting & Packing Co., Ltd.

Inspection and Tests
Hunt, The Robert W. Co

Insulated Wires and Cables

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

Iron Castings
Poole, R., & Son Co.

Laddies
Obermayer Co.

Lamps, Miners'
Everhardt, J. M.

Lathes
Seneca Falls Mfg. Co.

Lead, White, Machinery
Poole, R., & Son Co.

Locomotives
General Electric Co.
Hunt, C. W. Co.
Porter, H. K., & Co.
Thomson-Houston International Co

Lubricants
Dixon, Jos., Crucible Co

Machine Molded Gearing
Poole, R., & Son Co.

Machinists
Poole, R., & Son Co.

Marine Railways
Poole, R., & Son Co.

Machinery.

Dealers in Mining, Milling, and Other Machinery
Aetna Fdy. & Mach. Co.
Allis, Ed. P., & Co.
Amer. Mining & Milling Machinery Co
Armstrong Brothers.
Beckett Foundry & Machine Co.
Boston Ore Mach'y Co.
Buckeye Engine Co.
Bullock, M. C., Mfg. Co.
Colorado Iron Works.
Exeter Mach. Wks. Co.
Fraser & Chalmers
Griffith & Wedge Co
Hendrie & Bolthoff Mfg. Co.
Jeffrey Mfg. Co.
McKiernan, S. G. & Co.
Mech'l Gold Extr. Co.
Mecklenburg Ir. Wks.
Moore, Sam. L., & Son.
Penn Diamond Drill & Mfg. Co.
Pierce & Miller Engineering Co
Pollock, Wm. B., & Co.
Poole, Robt. Son & Co.
Scaife, W. B., & Sons.
Seymour Concent. Co.
Stedman Fdy. & M. Co.
Sullivan Mach'y Co.
Thomson-Houston International Co.
Trenton Iron Co.
Union Iron Works.
Vulcan Iron Works.
Walbra-Swens'n Mfg. Co.
Webster, Camp & Lane Mach. Co.
Wright & Adam Co.

Metal Dealers
Abbott, Wheelock & Co
American Metal Co.
Am. Zinc-Lead Co.
Baker & Co.
Cowles Elec. S. & Aluminum Co.
Eureka Co.
James & Shakspeare.
Jonnson, Matthey & Co.
Lewisohn Bros.
Mathison Sm'lting Co.
Orford Copper Co.
Phelps, Dodge & Co.
Picher Lead Co
State Ore Sampling Co
Victor Chemical Co.

Metallurgical Works and Ore Purchasers' Processes
American Zinc Lead Co.
Baker & Co
Balbach Smelting & Refining Co.
Baltimore Copper Works.
Canadian Copper Co.
Cowles Elect. Smelt. & Aluminum Co.
Kansas City S. & Ref. Co.
Ledoux & Co.
Mechanical Gold Extractor Co.
Orford Copper Co.
Pennsylvania Salt Mfg. Co.
Ricketts & Banks.
Russell Process Co.
St. Louis Sampling & Testing Works.
State Ore Sampling Co.
Walburn-Swenson Mfg. Co.

Mine Cars
Sheffield Car Co.

Mining and Land Companies
Atlantic Mg. Co.
Boston & Mont. Mg. Co.
Central Mg. Co.
Copper Queen Mg. Co.
Detroit Copper Mg. Co.
Eureka Co.
Golden R'f Mg. & M. Co.
Lawrence Land Co.
Monte Cristo Con. Mg. & M. Co.
Osceola Con. Mg. Co.
Quebrada R. R. L. & C. Co.
Tamarack Mg. Co.

Nickel
Canadian Copper Co.

Nuts, Lock
Young Lock Nut Co.

Ore Cars
Truax Mfg. Co.

Ore Testing Works
Hunt & Robertson.
Ledoux & Co.
Ricketts & Banks.
State Ore Sampling Co

Packing and Pipe Coverings
Brandt, Randolph.
Jenkins Bros.
Keasby, Robt.
New York Belting & Packing Co., Ltd.
Wyckoff & Son, A.

Patents
Atkins, J. L.

Perforated Metals
Harrington & King Perforating Co.
Hendrick Mfg. Co.
Mundt & Sons.

Periodicals
Arms and Explosives.
Austral'n Mg Stand'd
El Minero Mexicano.
Electrical Plant & Electrical Industry.
Financial Times
Iron & Coal Trades Review.
Indian Engineering.
Mining Journal.

Phosphates
Trennoim, Paul C.

Phosphor-Bronze
Phosphor-Bronze Smelting Co.

Picks, Miners'
Collins & Co.

Pile Drivers
Bucyrus Steam Shovel and Dredge Co.

Pipes
Pollock, Wm. B., & Co.
Wyckoff & Sons, A.

Planed Gearing
Poole, R., & Son Co.

Platinum
Baker & Co.
Johnson Matthey & Co.

Plumbago—East India
Obermayer Co.

Powder
Aetna Powder Co.
Laflin & Rand Powder Co.
Law, J. H., & Co.

Pulleys
Poole, R., & Son Co.

Pumps
Aetna Fdy. & Mach. Co.
Allen, Chas. A.
Blake, Geo. F., Mfg. Co.
Cameron, A. S., Steam Pump Works.
Epping, Carpenter & Co.
Groetzinger, A., & Sons
Jeanesville Iron Wks.
Knowles Steam Pump Works.
McGowan, John H., & Co.
Pulsometer Steam Pump Co.
Stilwell-Bierce & Smith-Vaile Co.
Worthington, Henry

Publications
Allison Coupon Co.
Arms & Explosives.
Australian Mining Standard.
Electrical Plant & Electrical Industry
Financial Times
Iron & Coal Trades Rev.
Mining Journal.

Pyrites
Adams W. H.

Quarrying Machines
American Diamond Rock Boring Co.
Bostelman, L. F.
Ingersoll-Sergeant Rock Drill Co.
Rand Drill Co.
Sullivan Machinery Co.
Union Wire Rope Tramway Co.

Quicksilver
Eureka Co.

Railroad Supplies and Equipment
Hunt, C. W., Co.
Porter, H. K., & Co
Robinson & Orr.
Young Lock Nut Co.
(See Machinery.)

Regulators, Damper, Heat, Etc.
Eddy Valve Co.
Lunkenheimer Co.
Mason Regulator Co.

Rock Drills. (See Air Compressor.)

Rolling Mill Machinery
Poole, R., & Son Co.

Roofing
Berlin Iron Bridge Co.
Holton Iron & Steel Roofing Co.
Pencoyd Bridge and Const. Co.
Phelps, Dodge & Co.
Pittsburg Bridge Co.
Scaife, Wm B., & Sons

Rope Wheels
Poole, R., & Son Co.

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

Screens
Exeter Machine Works Co.
Harrington & King Perforating Co.
Mundt & Sons.
Tyler W. S., Wire Works Co.
(See Machinery.)

Screen Plates
Harrington & King Perforating Co.

Separators
Harrison Safety Boiler Works.

Shafting
Poole, R., & Son Co.

Shoes and Dies
Chrome Steel Works.
Crescent Steel Co.

Shovels (Steam)
Bucyrus Steam Shovel & Dredge Co.
Souther & Co.

Smelting and Refining Works
Balbach S. & Ref. Co.
Baltimore Cop'r Wks.
Bos. & Colo. Smelt. Co.
Cowles Smelt. & Alu. Co.
Kansas City S. & Ref. Co.
Mathison Smelting Co.
Orford Copper Co.
Penn Lead Co.
Penna. Salt Mfg. Co.
Penn Smelting and Refining Works.
Phosphor-Bronze Smelt. Co.

Steam Fans
Cole, Wm. E.

Steel Rails, Castings, Rolls, Drill Steel
Abbott, Wheelock & Co.
Bethlehem Iron Co.
Chester Steel Cast. Co
Chroma Steel Works.
Crescent Steel Co.
Exeter Machine W. Co
King & Andrews Co.
Moore, S. L., & Sons Co
Roberts, A. & P., & Co.
Robinson & Orr.
Whitney, A., & Sons.
(See Metal Dealers)

Tanks
Pollock, Wm B. & Co.
Scaife, Wm. B. & Sons.
Williams Mfg. Co.

Tapping Machine, Gas Main, Etc.
Mueller Mfg. Co.

Telegraph Wires and Cables
Okonite Co. The, Ltd.

Tin Plate Rolling Machinery
Poole, R., & Son Co.

Tools
Pratt & Whitney Co.

Tubes
Pollock, Wm. B., & Co.
Williams Bros.

Tubing-Rubber
New York Belting and Packing Co., Ltd.

Turbines
James Leffel & Co., The.
Poole, Robt. & Son Co
Stilwell-Bierce & Smith-Vaile Co.

Turbine Water-Wheels
Poole, R., & Son Co.

Valves
Eddy Valve Co.
Jenkins Bros.
Lunkenheimer Co.
Mason Regulator
Sturtevant & Co., B. F.

Ventilators
Bullock, M. C., Mfg. Co.

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

Washers
Milton Mfg. Co.

Water Pressure Reducers
Mueller Mfg. Co.

Water Pressure Regulators
Mueller, H., Mfg. Co.

Water-Wheels
Poole, R., & Son Co.

Well Drilling Machinery
American Diamond Rock Boring Co.
Bostelman, L. F.
Penn Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
Williams Bros.

Wheels, Car
Sheffield Car Co.

White Lead Machinery
Poole, R., & Son Co.

Wire Cloth
Harrington & King Perforating Co.
Mundt & Sons.
Tyler, W. S., Wire Works.

Wire Rope & Wire
Abbott, Wh'lock & Co.
Broderick & Bascom Rope Co.
California Wire Wks
Cooper, Hewitt & Co.
Hunt, C. W., Co.
Leschen, A., & Sons Rope Co.
Phelps, Dodge & Co.
Roebling, J. A., Sons & Co.
Trenton Iron Co.
Washb'n & M'f'g Co.

Wire Rope Tramway
Brown Hoist. & Convey. Machine Co.
California Wire Works.
Colorado Iron Works.
Cooper, Hewitt & Co.
Hunt, C. W., Co.
Roebling, J. A., Sons & Co.
Trenton Iron Co.
Vulcan Iron Works.

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.

Positions Vacant.

1317 WANTED—A GENERAL MANAGER for a railroad in South America; must speak Spanish and be well recommended. A thorough knowledge of the operation and organization of a railroad absolutely necessary. Apply by letter to RAILROAD, ENGINEERING AND MINING JOURNAL.

1318 WANTED—A THOROUGHLY COMpetent Master Mechanic, to take charge of railway shops in South America. A knowledge of Spanish absolutely necessary. Apply to COLOMBIA, ENGINEERING AND MINING JOURNAL.

1320 WANTED—AN EXPERT PLACER miner to superintend the installation and operation of hydraulic plant in South America. Address COMPETENT, ENGINEERING AND MINING JOURNAL.

1321 WANTED—AN EXPERIENCED ASsayer and chemist for silver-lead smelter in Mexico. Salary fair. Address MEX., ENGINEERING AND MINING JOURNAL.

1322 WANTED—AN ENGINEER WHO is familiar with subsoil and spring drainage to report on draining a property near New York City. Address, giving experience and references, SUBSOIL, ENGINEERING AND MINING JOURNAL.

Situations Wanted.

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

CHEMIST WANTS POSITION AT BLAST furnace or iron ore mines. Best references. Address L. P. N., ENGINEERING AND MINING JOURNAL. No. 16,180, April 7.

POSITION WANTED.—A THOROUGH THEoretical and practical engineer and manager is open to engagement; six years' practical experience in construction and management of electric railways. A. C. H., ENGINEERING AND MINING JOURNAL. No 16,178, April 14.

A RENSSELAER GRADUATE, THREE years' experience, desires a position. Has had experience in preliminary, location, construction and maintenance of way; also on masonry dams Address T. X., ENGINEERING AND MINING JOURNAL. No. 16,190, May 5.

WANTED—SITUATION AS CHEMIST AND metallurgist; have had several years' experience with all classes of furnace supplies and products; technical education. Good reasons given for leaving present situation. Address A. M. H., ENGINEERING AND MINING JOURNAL. No. 16,164. May 19.

WANTED—SITUATION IN SMELTING OR concentrating works; technical education; several years' experience in treating low grade ores. References given Address SMELTING AND CONCENTRATING, ENGINEERING AND MINING JOURNAL. No. 16,165, June 9.

A GRADUATE (M. I. T.) COPPER CHEMIST and metallurgist of experience desires engagement; references. Address WEST, ENGINEERING AND MINING JOURNAL. No. 16,205, May 12.

A FIRST-CLASS DRAUGHTSMAN, EXPERT letterer; large experience; desires a steady position; samples and references will be furnished. Address, PERMANENT, ENGINEERING AND MINING JOURNAL. No. 16 206, April 7.

MINING ENGINEER, GRADUATE, OPEN for engagement May 15. Twelve years' practical experience in the development and management of metalliferous mines. Can give present employers' and other references. Address COLORADO, ENGINEERING AND MINING JOURNAL. No. 16,177 tf.

FOUNDRY FOREMAN IS OPEN FOR ENgagement where sobriety and push will be appreciated. Understands mixing and melting of irons; 16 years' experience as foreman of first-class shops. Address PUSH, ENGINEERING AND MINING JOURNAL.

Contracts Open.

DRILLING ARTESIAN WELLS.—DEPARTment of the Interior, Office of Indian Affairs, Washington, D. C. Sealed proposals indorsed "Proposals for Drilling Artesian Wells," and addressed to the Commissioner of Indian Affairs, Washington, D. C., will be received until April 10, 1894, for furnishing the necessary materials and labor required in drilling one artesian well each on the Pine Ridge, Rosebud and Standing Rock Indian Reservations in South Dakota. Bidders to furnish their own specifications for doing the work, and if possible state the length of time proposed to be consumed in drilling each of the wells. A separate bid for each well is required. Location of the proposed wells, means of transportation, with cost per cwt., and such knowledge of the local conditions of each reservation as is had by the U. S. Indian Agents in charge of the reservations named, will be furnished upon application to said agents, whose postoffice addresses are respectively: Pine Ridge Agency, S. D.; Rosebud Agency, S. D., and Standing Rock Agency, N. D. Proposals will be made to do the work at stated rates per foot, and not for a lump sum. The right is reserved to reject any or all bids or any part of any bid if deemed for the best interests of the service. D. H. BROWNING, Commissioner.

PORTLAND CEMENT.—U. S. Engineer Office, Montgomery, Ala.—Sealed proposals, in triplicate, for furnishing and delivering, at Wetumpka, Ala., 10,000 barrels, more or less, of Portland Cement will be received at this office until April 12, 1894, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. F. A. MAHAN, Capt. Corps of Engineers, U. S. A.

PUMP-HOUSE.—Office Constructing Quartermaster, Burlington, Vermont.—Sealed proposals in triplicate will be received at this office until April 9th, 1894, and opened immediately thereafter, for the construction at Fort Ethan Allen, Vermont, of a pump-house, complete, and pumping plant, complete, in accordance with the plans and specifications to be seen at this office, where general instructions and circular to bidders and blank forms of proposals will be furnished. The United States reserves the right to reject any or all bids. Address Captain GUY HOWARD, Assistant Quartermaster U. S. Army.

STEAM HEATING APPARATUS.—Treasury Department, Office Supervising Architect, Washington, D. C.—Sealed proposals will be received at this office until the 13th day of April, 1894, 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 U. S. Post Office Building at Martinsburg, W. Va., in accordance with the drawings and specification, copies of which may be had at this office, or the office of superintendent at Martinsburg, W. Va. Each bid must be accompanied by a certified check for a sum not less than 2 per cent. 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, if it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked "Proposal for Heating and Ventilating Apparatus for the U. S. Post Office Building at Martinsburg, W. Va.," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

TREASURY DEPARTMENT, OFFICE SUPERvising Architect, Washington, D. C., April 5th, 1894.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 2d day of May, 1894, and opened immediately thereafter, for all the labor and materials required to fix in place complete the low-pressure, steam heating and mechanical ventilating apparatus, including elevator power boiler, etc., for the U. S. Court House, Post Office, etc., building at Paris, Texas, in accordance with drawings and specification, copies of which may be had at this office or at the office of the Superintendent at Paris, 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 bids received after the time stated will be returned to the bidders. Proposals must be inclosed in envelopes, sealed and marked, "Proposal for the Low-Pressure, Steam Heating and Mechanical Ventilating Apparatus, Elevator Power Boiler, etc., for the U. S. Court House, Post Office, etc., Building at Paris, Texas," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

NAVAL SUPPLIES.—Sealed proposals, indorsed "Proposals for Supplies for the New York Navy Yard, To Be Opened April 17, 1894," will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until April 17, 1894, and publicly opened immediately thereafter, to furnish at the New York Navy Yard a quantity of lubricating oil, red lead, white lead, white zinc, iron pipe, brass pipe, pipe fittings, lavatories, fire clay, files, borax, rivets, bolts and candles. The articles must conform to the Navy standard and pass the usual naval inspection. Blank proposals will be furnished upon application to the Navy Pay Office, New York. The attention of manufacturers and dealers is invited. Tie bids, all other things being equal, decided by lot. EDWIN STEWART, Paymaster-General, U. S. Navy.

DREDGING—U. S. Engineer Office, 537 Congress street, Portland, Me.—Sealed proposals for dredging in Portland Harbor, Maine, will be received at this office until April 21, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. PETER C. HAINS, Lieut.-Col. of Engineers.

PUMPING PLANT.—The City of Concordia, Kansas, wants a 60-horse power boiler, feedwater heater with all attachments, compound duplex pump 1,000,000 gal. capacity and ten tubular wells 6 in. diam. with connections. Bids close April 9th, 1894. Plans and specifications can be seen at the office of W. Kiersted, room 58, Waterworks Building, Kansas City, Mo., or with the undersigned. J. H. TYNER, City Clerk.

WATER WORKS.—Sealed proposals will be received for the construction of a complete system of water works for the City of Poplar Bluff, Mo., until April 16th, 1894. Plans and specifications may be seen at the clerk's office in Poplar Bluff, Mo. Bids will be received for the whole or a part of the system. Right to reject any or all bids reserved by council. A certified check for $500 must accompany all bids. J. B. REYNOLDS, Clerk of Poplar Bluff; ISAAC A. SMITH, Consulting Engineer, St. Louis.

U. S. ENGINEER OFFICE, 537 CONGRESS Street, Portland, Maine.—Sealed proposals for dredging in Portland Harbor, Me., will be received at this office until April 21, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. PETER C. HAINS, Lieut.-Colonel of Engineers.

U. S. ENGINEER OFFICE, 537 CONGRESS Street, Portland, Maine.—Sealed proposals for dredging in Penobscot River, Maine, will be received at this office until April 21, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. PETER C. HAINS, Lieut.-Colonel of Engineers.

U. S. ENGINEER OFFICE, 2258 WABASH Avenue, Chicago, Ill.—Sealed proposals for the design, manufacture and erection of the superstructures of one metal single track railway swing bridge and one metal highway swing bridge at Milan, Ill., will be received at this office until 12 M., central time, Tuesday, May 1, 1894, and then publicly opened. Specifications, blank forms and all available information will be furnished on application to this office. W. L. MARSHALL, Capt. Corps of Engineers.

PUMPING ENGINE AND BOILERS.—Office of the Commissioners D. C., Washington, D. C.—Sealed proposals will be received at this office until April 14th, 1894, for furnishing a pumping engine and boilers. Specifications and blank forms of proposals may be obtained at this office. J. W. ROSS, GEO. TRUESDELL, CHAS. F POWEL, Commissioners D. C.

GRADING, ETC.—The undersigned will receive tenders up to April 10 for the grading and other works connected with the building of 50 miles (in sections of 2 to 10 miles) of the Tring-Megantic branch of the above-mentioned railway. Plans, profiles and specifications may be seen at the office of the contractors, where forms of tenders and all other information may be obtained. HOLT & LUKES, Sherbrooke, P. Q., Canada.

IRRIGATION WORKS.—Sealed bids will be received at the office of the Rio Grande Dam and Irrigation Co., El Paso, Texas, until April 15th, 1894, for the construction of dams and canals. Apply to the Secretary for full information. EDWIN C. ROBERTS, President; E. V. BERRIEN, Secretary, El Paso, Texas.

SEWER.—Sealed bids will be received at the office of the Commissioner of Public Works of Peoria, Ill., until April 6th, 1894, for the construction of sewers in the Walnut St. Sewer District, consisting approximately of the following quantities of work: Brick sewer as follows: 193 ft., 3 ft. 0 in. × 4 ft. 6 in.; 351 ft., 2 ft. 10 in. × 4 ft. 3 in.; 165 ft., 2 ft. 4 in. × 3 ft. 6 in. 412 ft., 2 ft. 3 in. × 3 ft. 4½ in.; 456 ft. 2 ft. 1 in. × 3 ft.; 1½ in.; 196 ft. 2 ft. × 3 ft. Pipe sewer as follows: 287 ft. 18 in.; 1,341 ft. 14 in.; 3,261 ft. 12 in.; 2,264 ft. 10 in.; 16,622 ft. 8 in.; 1,650 ft. 6 in.; 57 manholes, 35 flush tanks, 17 storm water inlets, 12 independent lamp holes, 26 cu. yds. outfall stone abutment. Bids must be accompanied by a certified check for $2,000 For information, form of contract, specifications, etc., apply to the City Engineer. ISAAC TAYLOR, Commissioner of Public Works, JACOB A. HARMAN, City Engineer.

WATERWORKS SYSTEMS.—U. S. Indian service, Fort Peck Agency, Poplar Creek, Mont.—Sealed proposals, indorsed "Proposals for Waterworks Systems," and addressed to the undersigned at Poplar Creek, Mont., will be received at this agency, for furnishing, delivering and placing in position at this agency and at the Wolf Point sub-agency, water-tanks, wind-mills, pumps, iron pipe, fire hydrants, etc., required in the construction of waterworks systems. A full list of the articles required together with plans and specifications governing the work at each point will be furnished upon application to the undersigned. Indians to be employed to do all necessary work of excavating for water pipes, foundations, etc. Rates per day to be paid them will be supplied bidders upon application. Capt. H. W. SPROLE, U. S. Army, Acting U. S. Indian Agent.

LANDS AND MINES FOR SALE.

Grand Opportunity for Investment

FROM 4,000 TO 4,500 ACRES

Coal, timber and farming lands, near railroad in Somerset County, Pennsylvania, accessible to Eastern markets, for sale on most reasonable terms, or might consider income property clear in part payment if location satisfactory. Owners have not time to give attention. Title perfect. Inquire of

W. P. HUMES
Bellefonte, Pa.

FOR SALE.

SOUTHERN GOLD MINE.

AT REASONABLE PRICE.

Favorably located. Sufficiently developed to prove value. Promises quick and large returns. Reasons for sale, lack of capital.

—ADDRESS—

PROF. J. C. HORTON,
Kings Mountain, N. C., or Box 60, Waterbury, Conn.

GOLD PROPERTY.

I have some of the most valuable Gold Properties in the United States for sale, situated in North Georgia; some of them well developed, fine water power and plenty of timber. Write for description.

L. L. THOMASSON,
Chattanooga, Tenn.

FINANCIAL.

Golden Reef Mining and Milling Co.

Capital Stock, 100,000 Shares.
Par Value, $10.
Selling Price, $2.50 per share
Gold and Copper Mines at Norris, Madison County, Montana.

TO INVESTORS.

The Golden Reef Mining and Milling Company, of Chicago, Illinois, offer to investors a limited number of shares of their Treasury Stock. This stock is guaranteed and is absolutely safe. The company's mines have been opened up. Many thousand tons of gold and copper ore of paying quality. All that is required to put the property in a dividend-paying condition is a milling plant. The mill is already built and ready for shipment.

Make all checks, drafts, etc., payable to THOMAS F. THORNE, of the Commercial National Bank, Chicago, Trustee. For prospectus and full information address E. M. FREAKLE, Sec'y, Room 1595, No. 79 Dearborn St., Chicago.

DIVIDENDS.

AMERICAN DEVELOPING AND MINING COMPANY.
211 North Main Street, Butte, Montana,
March 31st, 1894.

A dividend of ten cents per share has been declared, payable April 11th, 1894, to stockholders of record on April 4th, 1894. Transfer books close April 4th and reopen April 16th, 1894. E. L. WHITMORE, Secretary.

MOLLIE GIBSON CONSOLIDATED MINING AND MILLING COMPANY.
COLORADO SPRINGS, Colo., December 1st, 1893.
DIVIDEND NO. 41

A dividend of five cents per share ($50,000) has been declared, payable December 15th, 1893, to stockholders of record on December 8th. Transfer books close December 8th, and reopen December 16th, 1893.
PERCY HAGERMAN, Sec'y-Treas.

RICO-ASPEN CONSOLIDATED MINING COMPANY.
DENVER, Colo., March 30th, 1894.

A dividend of two and one-half cents per share, twenty-five thousand dollars, has been declared, payable April 15th, to stockholders of record on April 10th.

Transfer books close April 10th, and reopen April 16th. Transfers of stock to be made at the general offices of the company, Denver, Colo., or at the offices of W. M. Tuttle, 22 William Street, New York, or Elliot, Johnson & Co., Philadelphia. A. B. ROEDER, Secretary.

MACHINERY AND SUPPLIES FOR SALE.

MACHINERY FOR SALE.

THE following Machinery is all new, and was displayed at the World's Columbian Exposition by the Chicago Iron Works. It is now offered for sale by order of the Superior Court. Full details and prices can be obtained on application to Rockwell King, Receiver, Estate Chicago Iron Works, Chicago, Ill.

	Weight.
8″ × 12″ Hoisting Engine—two cylinders, single drum, 42″ × 40″ grooved for holding 500 ft. ⅞″ rope in single coil	8,000 lbs.
5 ft. Bryan Mill	22,000 lbs.
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