

THE ENGINEERING AND MINING JOURNAL



Entered at the Post-Office of New York, N. Y., as Second-Class Mail Matter.

VOL. LVII. MAY 26. No. 21.

RICHARD P. ROTHWELL, C. E., M. E., Editor.
 ROSSITER W. RAYMOND Ph. D. M. E., Special Contributor.
 SOPHIA BRAEUNLICH, Business Manager. E
 THE SCIENTIFIC PUBLISHING CO., Publishers.

SUBSCRIPTIONS TO THE ENGINEERING AND MINING JOURNAL are PAYABLE IN ADVANCE. Price: For the United States, Mexico and Canada, \$3 per annum; \$2.50 for six months; all other countries in the Postal Union, \$7.
 The address slip on the paper will show date of expiration of subscription. Subscribers wishing their address changed will please give the name of the old post-office as well as the new one.

NOTICE OF DISCONTINUANCE.—The JOURNAL is not discontinued at expiration and is sent to subscribers until an explicit order is received by us, and all payment of arrearages is made, as required by law. The courts invariably hold a subscriber responsible to the publisher for the subscription price of all papers received until the paper is paid for in full up to date and ordered discontinued. PAPERS RETURNED ARE NOT NOTICE OF DISCONTINUANCE.

ADVERTISING RATES furnished on application.
 REMITTANCES should always be made by Bank Drafts, Post-Office Orders or Express Money Orders on New York, payable to THE SCIENTIFIC PUBLISHING CO.

THE SCIENTIFIC PUBLISHING COMPANY.

OFFICERS: R. P. ROTHWELL, Pres. & Gen'l Mang. | F. O. BOX 1533.
 SOPHIA BRAEUNLICH, Sec'y & Treas. | 253 Broadway, New York.

Cable Address: "Rothwell, New York." Use A B C Code, Fourth Edition.

LONDON OFFICE:

20 Bucklersbury (Room 366), London, E. C., England.
 Edward Walker, Manager.

CHICAGO OFFICE: "The Rookery," Room 531.

CONTENTS.

The "Mineral Industry".....	481
British Iron Exports.....	481
Trade with South America.....	481
The Coal Miners' Strike.....	482
The Latest Armor-Plate Trial.....	482
The Mineral Production of the United States.....	482
New Publications.....	484
Books Received.....	484
The Henrietta Mine, Arizona.....	484
The Failure of the Harveyized Armor Plate.....	484
Recent Decisions Affecting the Mining Industry.....	484
* Test of the "Indiana's" Armor.....	485
* Variations in the Milling of Gold Ores.....	T. A. Rickard 486
Abstracts of Official Reports.....	488
* Machine for Hoisting Mine Caps.....	W. H. Moeller 489
Coal Measures of Burnt Mountain, Ala.....	A. M. Gibson 489
North Carolina Iron Ores and Magnetic Concentration.....	W. B. Phillips 490
Patents Issued.....	490
Personal, Obituary, Societies, Technical Schools, Industrial.....	491
Notes: German Mining Wages, 485—Electric Generating Station at Tivoli, 485—Irrigating an Indian Reservation, 488—The Heilman Electric Locomotive, 489—Deepest Bore-Hole in the World, 489—Petroleum as Fuel on Russian Railroads, 490—New Iron and Steel Works in Russia, 490—Manufacture of Briquette Fuel, 490.	

MINING NEWS.	FOREIGN NEWS.	Buffalo..... 498	Salt Lake City 502
Arizona..... 492	Br. Columbia..... 498	Philadelphia..... 499	London..... 502
California..... 492	Chile..... 498	METALS..... 499	Philadelphia..... 502
Colorado..... 492	Great Britain..... 498	CHEMICALS AND MINERALS..... 500	Aspen..... 504
Idaho..... 493	India..... 498	MINING STOCKS:	Colorado Springs..... 504
Indiana..... 491	New So. Wales..... 498	New York..... 501	Duluth..... 504
Kentucky..... 494	Ontario..... 498	Boston..... 501	Helena..... 504
Michigan..... 494	South Africa..... 498	San Francisco, 511	Pittsburg..... 504
Minnesota..... 494	LATEST MINING NEWS..... 497	Paris..... 501	St. Louis..... 504
Montana..... 494	MARKETS:	Meetings..... 501	Shanghai..... 504
Nevada..... 495	COAL:	Assessments..... 504	Paris..... 504
New Jersey..... 495	New York..... 497	MINING Co's..... 503	Coal Stocks..... 502
New Mexico..... 495	Buffalo..... 497	STOCK QUOTATIONS:	Ind. and Trust..... 502
Ohio..... 495	Chicago..... 498	New York..... 502	CURRENT PRICES:
Oregon..... 495	Pittsburg..... 498	Boston..... 502	Chemicals..... 504
Pennsylvania..... 495	IRON:	San Francisco, 502	Minerals..... 504
South Dakota..... 496	New York..... 498	Baltimore..... 502	Rarer Metals..... 504
Texas..... 496	Chicago..... 498	Denver..... 502	ADVT. INDEX..... 15
Utah..... 496	Pittsburg..... 498	ADVT. RATES..... 33	
Vermont..... 496			
Washington..... 496			
Wyoming..... 496			

THE MINERAL INDUSTRY.

The second annual volume of the "Mineral Industry: Its Statistics, Technology and Trade," now in the binder's hands, will be ready for distribution in a few days. This volume, which contains more than 1,000 pages, it may safely be asserted, gives more useful information concerning the mineral industry than does any other single volume ever published in any language. It supplements the first annual volume which was issued a year ago, and together they give substantially the whole of the statistics of production, imports, exports and consumption of minerals and metals in all the countries of the world, and they give in addition such extremely valuable articles on the very latest practice and processes used in the production of the minerals and metals that they may well be designated a thoroughly practical treatise of metallurgy absolutely up to date.

Every one interested in any department of the mineral industry, whether as producer, dealer, manufacturer or consumer of any of the useful minerals or metals, and every one interested in furnishing machinery, supplies or materials of any kind to the industry, will find these volumes of the greatest value:

This second annual volume treats of the following minerals and metals and their products, and contains numerous important technical monographs.

Abrasive materials; alum; aluminum; antimony; arsenic; asbestos; asphaltum; barytes; bauxite; bismuth; borax; bromine; cadmium; cements; the chemical industry, with the latest electrolytic and other processes applied in America and Europe; chrome iron ore and its products; clay and the clay industry; coal, with graphical tables of production, consumption per capita, production per man employed, costs, markets, coal mining machines and their work; copper production, consumption, markets, improvements in copper metallurgy, all the electrolytic refining processes, present practice in copper concentration and extraction throughout the world; copperas; cryolite; feldspar; fluorspar; gold and silver; graphite; gypsum; iron and steel; advances made in iron and steel metallurgy; open-hearth work at Steelton, Pa.; lead, distribution and production of lead in all countries; recent improvements in the treatment of argentiferous lead ores; limestones, marble and lime; lithographic limestone; magnesite; magnesium; manganese; marls; mica; nickel; onyx; ozokerite; peat; petroleum: its production, refining, markets, etc.; phosphate rock; phosphorus; precious stones; pyrites; quicksilver; the rare elements, their occurrence and production (barium, boron, calcium, cesium, cerium, chromium, columbium, didymium, erbium, gallium, germanium, glinium, indium, lanthanum, lithium, manganese, molybdenum, osmium, palladium, potassium, rhodium, rubidium, ruthenium, scandium, selenium, silicon, strontium, tantalum, tellurium, thallium, thorium, titanium, uranium, vanadium, ytterbium, yttrium, zirconium); salt; slate; sodium; sulphur; talc and soapstone; tin; tungsten; whetstones; scythe-stones and grindstones; zinc.

Statistics of countries: Australasia, Austria-Hungary, Belgium, Canada, other British Colonies, Chili, France, Germany, Greece, Italy, Japan, Norway, Portugal, Russia, Spain, Sweden, Denmark, Egypt, Holland, Roumania, China, Switzerland, United Kingdom, United States.

Assessments by mining companies; dividends paid from 1884 to 1893; markets; mining schools in the United States and Canada; present practice in ore dressing; theories of the origin of ores; stone quarrying, etc.

The exports of iron and steel from Great Britain for the four months to April 30th show a decided decrease. This year the total amount was 772,325 tons, valued at £5,773,901, while in the corresponding period of last year it was 861,835 tons, valued at £6,881,846; the diminution in quantity being 10.4 per cent., and in value 16.1 per cent. There has been a very large loss this year in the exports of railroad material to the Australian colonies, and a still larger one in the shipments of all classes of iron and steel to India, so that the manufacturers are realizing the effect of the silver policy in the latter country.

In spite of this decrease in exports there has been no falling off in production so far this year, but there is much complaint of low prices and increasing stocks on hand. The imports of iron ore have increased a little, having been 1,533,884 tons so far this year, or more by 3.5 per cent. than in the corresponding period of 1893.

The following letter from the British vice-consul at Bogota, Colombia, to our English contemporary "Machinery," contains an interesting reference to the comparison between British and American mining machinery:

"I have pointed out in my annual report for 1892 (annual series No. 1,148, of 1893) that of mining machinery 73.9 tons were exported from Great Britain in 1891 to this country as against 9.8 tons from the United States of America. Our mining machinery is undoubtedly far better suited to the local requirements than that manufactured in the United States. The Americans, however, do beat us in iron-bridge building; they better understand the local needs, send out the required lengths in metric measure and build much lighter than we do, and in consequence even English contractors prefer dealing with them than with our own people. I am given to understand that English manufacturers build their bridges at least 33% heavier than is actually required out here. The lighter bridges answer all that is needed, last as long and cost much less. No statistics are out yet for the year 1892, but when I send in my annual report I will draw farther attention to the comparison between English and the United States exports of machinery to this Republic."

It is, of course, flattering to find that our makers of bridge materials have shown the necessary amount of enterprise to adopt their product to

the need of the Colombian market, but it is the same old story with makers of mining machinery; they will not investigate the requirements of the Spanish-American trade nor pay proper attention to cultivating it, and as a result others are securing control of the market which naturally belongs to us.

THE COAL MINERS' STRIKE.

The great strikes of miners in nearly all the coal districts of the country are extremely injurious to many other departments of industry as well as to coal mining, and they have already occasioned a serious loss of life.

In the majority of cases the miners are not striking for higher wages or because of any recent reduction in wages, but to help to advance those in a few districts, no doubt the ultimate object being to advance wages all along the line.

The present condition of business makes this a peculiarly inappropriate time to ask for an advance in wages, and more particularly in coal mining, which would, by increasing the cost of fuel, greatly retard the long-awaited-for revival in many branches of manufacturing industry. There is, therefore, very little or no probability of any general success of the strike from the strikers' point of view, and the injury it is causing to the workmen in other industries will not be offset by any betterment in the coal miners' condition.

There is, however, another and more serious aspect of these strikes in the fact that the strikers are displaying unusually brutal tyranny in striving to force those to stop who are willing and anxious to work.

This is a free country, and every man has the undoubted right to refuse to work for wages which are not satisfactory to him and—subject to the rights of the public—men may stop work in a body, and thus bring a powerful pressure on the employer to concede the utmost wages his business will afford. It is also certain that those who wish to work for the wages offered have as good a right to do so as the others have to strike, and it is just as tyrannical to force one man to quit work which he desires to do as to force another to work against his will. Idle men have no rights which men at work have not, and the strikers' effort to force men out of work and to close mines and works is simply a tyranny beyond sufferance, and one which should be resisted by all the means which free men can command in defense of their liberties. If the mobs, composed largely of foreigners, that are destroying works and illtreating men who wish to work, were received everywhere, as they have been in a few cases, by officers of the law determined to put a stop to mob violence, we should soon have an end of these disgraceful scenes, and the lesson would be worth the loss of such a number of these strikers as it might involve.

THE LATEST ARMOR-PLATE TEST.

The test made on Saturday last, May 19th, at the government proving ground at Indian Head, of the heaviest armor plate yet made in this country, was of so much importance and interest that a member of the editorial staff of the "Engineering and Mining Journal" was sent to witness it, and his account of the test is given in another column, with photographs taken by him, by the courteous permission of Captain Sampson, Chief of the Bureau of Ordnance of the Navy Department, which illustrate the result in a very satisfactory manner.

The plate tried was made, by the Bethlehem Iron Company, of the nickel-steel which our Navy Department has approved and adopted for armor, and was hardened on the surface by the Harvey process.

The results of the present trial were very surprising. The first shot, a 12-in. Carpenter steel projectile, fired from a gun 360 ft. distant, with a muzzle velocity of only 1,465 ft. per second, not only penetrated the 18 in. of steel but broke the plate in two directions, for almost its entire width and length, while a second shot, with a velocity of 1,926 ft., completed its destruction, breaking it into three pieces. It was, in fact, a complete victory for the projectile and a disastrous failure for the plate.

It would not, of course, be fair or just to decide from this single failure against the use of nickel-steel or of the Harvey process. The preliminary examination of the broken plate has shown no serious flaws or defects, and it was taken for test as a fair sample plate, but some special cause for its failure may possibly have existed, and further trials will be needed before any intelligent decision can properly be reached. Nor will our authorities be willing to accept a single test as a reversal of all their former conclusions. The trials made in this country, the Ohta tests in Russia, the Creusot tests in France, and others have all seemed to show that nickel-steel is the best metal yet made for armor plates, and up to the present time the value of the Harvey process in hardening the surface has been generally accepted. It is, however, stated that the results of some recent experiments in England, no account of which has been made public, have decided the English Government to adopt the Harvey treatment, while abandoning the nickel-steel.

The cause of the failure of the great plate is not yet understood, and many surmises will be made as to why it was. It may be that what was lacked was more of John Fritz in the make-up of the plate, that careful old manager who never took any chances and succeeded, though some of his precautions may have appeared superfluous.

This action of the plate seems to us to show great internal strains which may have come from the manner of tempering, of cooling or from the temperature at which the plate was worked. Cases of such internal strains are very familiar to every one who works in iron and steel, and it is also well known that in some cases, perhaps in all, these internal strains are only temporary, being greatest when the material is first turned out and gradually diminishing as the molecules of the material rearrange themselves, until they come to an equilibrium, when the internal strain disappears, and the piece can then carry its full load, or resist to the full limit of which its material is capable.

An example which occurred in our practice years ago was as follows: Certain wire rods purchased as of the best quality broke readily when they were being drawn into wire. The rods were condemned and thrown out in the yard and lay under the snow and rain for the greater part of a year, and were then tried again and drew without the least difficulty and were in fact of excellent quality. Apparently in this case the internal strains in the freshly rolled rods were so great that the additional strain in drawing exceeded the strength of the material, but in time the particles rearranged themselves and left the entire strength of the material effective against external strains. So it very possibly may be in the case of this great armor plate. It is quite conceivable that in time the internal strains, which we assume existed in the plate, would be relieved, and the plate would then resist perfectly the shot which would have broken it when it was new. If this be a correct hypothesis, the armor increases in resisting power the longer it is in use up to such time as it loses its internal strains. And no doubt this time would be a function of the thickness of the plate and the degree of internal strain existing in it when freshly made.

THE MINERAL PRODUCTION OF THE UNITED STATES IN 1892 AND 1893.

The immensity and variety of the mineral production of the United States may be appreciated after an inspection of the accompanying table giving the output of the chief mineral products and the value of the same in 1892 and 1893.

These figures would indeed be notable were the history of the industry counted by centuries, but when it is considered that only a few decades back it had scarcely an existence we must stand amazed at the richness of the natural resources of the country, and the intelligence, the enterprise and industry of a people which have achieved such results in these few years.

These statistics have been compiled for Vol. II. of "The Mineral Industry: Its Statistics, Technology and Trade," the statistical supplement of the "Engineering and Mining Journal." While no statistics are absolutely and mathematically exact, yet these are beyond doubt not only the fullest but the most accurate that have ever been compiled for the mineral production of the United States. Returns have been received from every producer of the principal metals and minerals, and these returns have been checked again by later reports.

For iron the official figures of the Iron and Steel Association of the United States have been accepted as of the highest authority. The coal statistics have been collected chiefly through the inspectors of coal mines of the several States whose duty it is to visit, several times during the year, each colliery in each inspection district. We have also received returns direct from nearly every coal mine in the country, and from several railroads on which the coal is mined. These figures are therefore checked official figures in the States where there are mine inspectors, and in all cases are compiled with the utmost care. In copper, lead, zinc, nickel, etc., the "Engineering and Mining Journal" has for many years collected and published the most accurate and authoritative statistics.

The gold and silver statistics of production have been collected direct from all the refiners who put these metals in final marketable form, and in the work we have been indebted to the Director of the U. S. Mint for valuable assistance. He has checked the distribution to States, especially of the gold. In all the other substances also the statistics have been compiled from direct returns, and the greatest precautions were taken to insure their accuracy.

It will be seen that in the year 1893 the mineral and metal production of this country as compared with 1892 has not declined in quantity as much as might have been expected from the financial depression, but it does show a material decline in values, amounting to over \$79,000,000. It is a noteworthy fact that the mineral production alone, while almost one-third greater in value than the metal product, decreased only one-half as much. Of the total decrease, over \$30,000,000 was in the decreased production and shrinkage of values in pig iron; \$9,000,000 was in coke and \$6,000,000 in bituminous coal, both of which were largely due to the decline in pig iron production. In silver the decrease in value amounted to

\$6,000,000. In but few cases was there any increase. Anthracite coal gained \$4,000,000 in value, thus partly offsetting the decline in bituminous, and gold increased \$3,000,000. The figures clearly show the solid foundation upon which the country's prosperity is based, and its stability.

The growth of the mineral industry of the United States has been so rapid as to be wholly beyond comparison with any other nation. Fifty years ago this country began to take rank as one of the important producers. In 20 years it had won a position among the leading nations, and now it not only excels all others, but the value of its products is almost

or, as Great Britain, France and Austria-Hungary; in the second half of 1893 our iron production suddenly dropped enormously. These two staples, iron and coal, serve to show the quick rise to supremacy as a producing country.

Thirty years ago, when our industry commenced its rapid growth, we had at command the knowledge which had been obtained in Europe through many centuries of experience. The methods and processes were tried, but were not found suitable, and changes were made in them to meet the new conditions; many new methods were devised and adopted.

THE MINERAL PRODUCTION OF THE UNITED STATES, 1892 AND 1893.

Compiled for THE MINERAL INDUSTRY, VOL. 2, by Richard P. Rothwell, editor "The Engineering and Mining Journal."

No.	Product.	Customary Measures.	1892.			1893.		
			Quantity.		Value at Place of Production.	Quantity.		Value at Place of Production.
			Customary Measures	Metric Tons.		Customary Measures	Metric Tons.	
1	Asbestos	Short tons	100	91	\$5,000	120	109	\$6,000
2	Antimony Ore	" "	850	771	51,000	850	771	41,000
3	Asphaltum and asphalt rock	" "	47,040	42,675	254,016	34,944	31,701	174,720
4	Barytes (crude)	" "	28,476	25,833	142,380	26,632	24,161	133,160
5	Bauxites	" "	9,800	8,891	49,000	11,041	10,106	55,205
6	Borax	Pounds	12,538,196	5,687	940,365	8,699,000	3,946	652,425
7	Bromine	" "	379,480	172	64,512	348,399	158	87,100
8	Building Stone	" "			44,589,500			\$40,000,000
9	Cement, hydraulic	Barrels of 900-400 lbs.	8,211,181		5,999,150	7,503,385		5,180,797
10	Cement, Portland	" "	547,440		1,153,600	596,531		1,152,839
11	Coal, anthracite	Long tons	46,850,405	47,352,696	89,727,982	48,044,834	48,818,356	93,091,670
12	Coal, bituminous (c)	" "	114,230,101	116,059,045	124,230,532	113,436,871	115,265,304	118,595,834
13	Coal	" "	12,010,829	12,304,209	23,421,117	9,792,330	9,949,966	14,889,495
14	Cobalt oxide	Short tons	8,600	8,300	6,450	3,893	*1,766	3,500
15	Copperas	Short tons	13,250	12,021	110,272	16,000	14,515	95,440
16	Copper sulphate	Pounds				54,000,000	24,492	1,822,500
17	Corundum	Short tons	1,504	1,364	139,994	1,747	1,585	140,589
18	Chrome ore	Long tons	1,650	1,677	16,500	1,620	1,646	16,000
19	Feldspar	" "	16,000	16,258	80,000	17,000	17,274	85,000
20	Flint	" "	37,000	37,596	185,000	38,000	38,612	190,000
21	Fluorspar	Short tons	9,000	8,165	54,000	9,700	8,800	63,070
22	Grindstones	" "			304,800	45,580	41,350	345,930
23	Gypsum	" "	250,250	232,456	695,492	250,000	226,739	562,500
24	Infusorial earth and tripoli	" "	1,323	1,200	41,950	1,709	1,530	46,800
25	Lime	Barrels, 200 lbs.	70,000,000	6,350,200	38,500,000	760,000,000	5,443,164	30,000,000
26	Limestone for iron flux	Long tons	4,560,000	4,633,416	2,097,600	3,750,000	3,810,375	2,250,000
27	Magnesite	Short tons	1,402	1,272	9,814	1,143	1,037	8,000
28	Manganese ore	Long tons	19,117	19,425	129,586	9,150	9,297	60,000
29	Marls	Short tons	125,000	113,400	65,000	110,000	99,792	55,000
30	Mica	Pounds	75,000	34	100,000	75,000	34	100,000
31	Millstones	" "			20,000			18,000
32	Mineral Paints	Long tons	50,000	50,805	650,000			546,000
33	Natural gas	" "			14,800,000			14,000,000
34	Onyx	Cubic feet	3,500		40,000	2,175		28,750
35	Ozokerite (refined)	Pounds	130,000	59	7,800	None		
36	Petroleum	Bbls., 42 gals.	50,512,136	7,000,982	30,229,128	50,249,228	6,978,403	30,223,505
37	Phosphate rock	Long tons	902,723	917,257	3,322,021	981,340	997,140	3,434,690
38	Plumbago (crude)	Short tons	900	816	3,500	1,500	1,365	7,500
39	Plumbago (refined)	Pounds	1,398,363	634	87,902	896,603	406	39,503
40	Potters' clay	Long tons	450,000	457,349	1,000,000	393,000	399,327	830,000
41	Precious stones	" "			188,000			200,000
42	Pyrites	Long tons	106,250	109,957	357,000	95,000	96,526	285,000
43	Salt	Barrels, 280 lbs.	11,784,954	1,542,133	5,900,000	11,435,487	1,452,388	5,717,743
44	Slate (for pigment)	Short tons	3,400	3,085	21,000	3,000	2,721	18,000
45	Slate (for roofing)	In squares	953,000		3,396,025	871,500		2,780,600
46	Slate (other kinds)	" "			750,500			737,400
47	Soapstone	Short tons	23,206	21,054	423,449	20,700	18,235	368,825
48	Soda, natural	" "	3,300	2,994	16,500	2,500	2,268	12,500
49	Soda, natural sulphate	" "	1,680	1,524	8,400	90	82	450
50	Sulphur	" "	1,825	1,656	54,750	1,344	1,219	26,880
51	Talc (fibrous)	" "	41,925	38,034	472,485	36,500	33,113	337,625
52	Venetian red	" "	4,205	3,815	89,335	3,830	3,475	81,475
53	Whetstones (g)	Gross pounds	1,090,000		107,580	900,000		105,925
54	Zinc, white	Short tons	27,500	24,946	2,200,000	25,000	22,678	1,875,000
Total non-metallic					396,610,582			371,376,935
METALLIC								
55	Aluminum, value at N. Y.	Pounds	295,000	134	191,750	312,000	142	202,800
56	Antimony, value at S. Fran.	Short tons	200	181	36,000	350	318	63,000
57	Copper, value at N. Y.	Pounds	325,500,000	147,647	36,716,400	322,585,500	146,324	34,677,340
58	Gold, coining value	Troy ounces	1,896,375	*49,652	32,997,071	1,739,081	*54,091	35,950,000
59	Pig iron, value at N. Y.	Long tons	8,977,869	9,122,413	134,668,035	7,043,384	7,156,782	93,888,309
60	Lead, value at N. Y.	Short tons	205,630	186,548	16,450,400	193,928	175,931	14,467,029
61	Nickel (fine)	Pounds	96,152	*43,614	57,691	25,893	*11,745	12,420
62	Platinum (crude)	Troy ounces	350	*11	1,750	300	*9.3	9,300
63	Quicksilver, value at S. F.	Flasks, 76 1/2 lbs.	27,993	971	1,119,720	30,164	1,046	1,108,527
64	Silver, coining value	Troy ounces	65,000,000	*2,022,195	84,038,500	60,500,000	*1,881,732	78,220,450
65	Spiegel-eisen and ferroman.	Long tons	179,131	182,015	6,647,390	61,118	82,424	2,893,229
66	Th	Pounds	143,400	65	29,827	None		
67	Zinc, value at New York	Short tons	84,082	76,279	7,785,993	76,255	69,178	6,214,782
Total metallic					320,740,427			267,707,795
Est. prod'ts. unspecified					\$ 7,500,000			\$ 6,000,000
Grand total					724,821,009			645,084,730

(f) Estimated. (g) Includes scythestones and novaculite. (h) Value taken as average of spiegel-eisen and ferromanganese, assuming production to have been one-third ferromanganese. (i) Including nickel in copper-nickel alloy and in exported ore and matte. (j) The production of petroleum stated in gallons is calculated in kiloliters, and converted to metric tons, by multiplying by 0.88. This gives an approximate result, the specific gravity of the various kinds of oils varies. * Kilograms.

as great as the value of the combined output of Great Britain, France and Germany.

Such a growth is phenomenal. In 1864 the United States with an output of 32,860,000 metric tons stood third among the coal producing nations, Great Britain leading with over 90,000,000 tons, Germany 26,000,000. In the 30 years since that time Great Britain has a little more than doubled its output. Germany has trebled, but the United States has increased eight times and produces now almost as much as Germany and all the rest of the world taken together, excepting only Great Britain. In the production of pig iron our growth has been even more remarkable. In 1865 the pig producing countries ranked with Great Britain first, then France, Germany and the United States; Great Britain alone producing almost six times as much as the United States. But in 1892 the United States output was more than 11 times as much as 30 years before, and almost half again as much as Great Britain; as much as Germany, France, Belgium and Austria-Hungary all together;

These changes have kept pace with the continued growth of the industry until now, the methods and processes in use, while they may in many cases be similar in principle to the old ones, are altogether different in practice. Practically they are new methods designed to fit the conditions and demands of a vast industry which is itself almost new.

Knowledge of technical and industrial practice has advanced in all civilized countries, but the practice has not always followed the knowledge. In the United States the rapidity with which one improvement has followed another has given our engineers a special training not obtainable elsewhere, so that instead of the United States sending to Europe for experts to advise on processes or direct the operation of industries, the older countries call upon our engineers to go to every part of the world where a mineral industry exists. The term an "American engineer" has indeed come to be almost synonymous in this as in some other departments of industry, with skill, energy and business capacity.

NEW PUBLICATIONS.

IOWA GEOLOGICAL SURVEY: VOLUME II. COAL DEPOSITS OF IOWA. By Charles Rollin Keyes, Ph. D., Assistant State Geologist. Des Moines, Ia.; published for the Survey. Pages 536; illustrated.

The second volume issued by the Iowa Geological Survey follows quite closely upon the first. It is devoted, very naturally, to the coal deposits, which form by far the most important of the mineral interests of the State. The first volume contained a chapter on these coal measures, which was a preliminary report or study, which in the present volume has been developed into a fuller account. Up to the present time no systematic investigation of the subject had ever been undertaken, chiefly for the reason that Iowa has always been regarded, by her own citizens as well as by outsiders, as a purely agricultural State, and the importance of her mineral resources has not been realized. The coal industry had grown rapidly, but such explorations as had been made were by individual enterprise. The State, however, has at last recognized the importance of the mineral interests, and the Geological Survey has made an excellent beginning in its work, as is shown by the first report and by the present volume.

After a general introduction and a chapter on the origin of coal, Dr. Keyes has divided his subject, taking up in succession the carboniferous basin of the Mississippi Valley; the general geology, the lithology and the stratigraphy of the coal measures; the extent and character of the coal beds of the different sections of the State; the composition of Iowa coals; the waste in coal mining, and finally the extent of the coal industry. He has made use not only of the work done by the Survey, but of such records as are available of previous investigations, and has sought to give all the information attainable on the subject. The result is an excellent monograph which has much in it that is of general interest, and which must be of special value to the coal operators of the State. The book is brought out in a very neat and substantial form and is fully illustrated and provided with maps, making it a volume creditable to the Survey and the State.

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.

A New Method of Smelting, Applicable to Iron Pyrites, Etc. Chicago; Fraser & Chalmers. Pamphlet, 16 pages.

Thirty-sixth Annual Report of the Board of Directors of the Brooklyn Library. Brooklyn, N. Y.; printed for the Library. Pamphlet, 24 pages.

The Iron Ores of the Mesabi Range. By J. E. Spurr. Gloucester, Mass.; reprinted from the "American Geologist." Pamphlet, 12 pages; illustrated.

Report of the Commissioner of Education for the Year 1890-91. W. T. Harris, Commissioner. Washington; Government Printing Office. Volume I., 656 pages; Volume II., 892 pages.

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 Henrietta Mine, Arizona.

EDITOR ENGINEERING AND MINING JOURNAL:

According to a late note in the "Engineering and Mining Journal" the Henrietta Mining Company started its new 20 stamp mill in January last, and much was expected from it, but now it has to be recorded that the mill has shut down and the men hold it for two months' wages. This case will be referred to as "another mine failure" and an instance of blasted expectations, instead of another failure of men's devices. In the interest of the mining industry it should be referred to, to show that the mines are too often condemned. This mine had been well examined and approved by competent men, and the workings have been equal to the statements made, but the mill was started under an agreement, drawn as tightly as possible, that one-half the gross receipts were to be taken to pay off the balance of the purchase money due. Such a paper is also expected to defeat the mechanics' lien law; whether it will or not is yet to be proved. It would take much more than an average mine to stand such a pull as that. Its inability to stand it gives us another example of "mine failure." It can easily be proved that there would have been good net proceeds for the sellers of the property, and the mine would be given a chance to earn a good record. It would not be fair to find fault with the sellers of the property for making such a demand, as their price was fixed at time of sale, and it was the purchasers' place to find the source of supply until payment was completed and they could start with a clean sheet. But the vain idea that a mine is to pay for itself has blasted many a fair mining enterprise. This county can furnish several fine examples of financial wrecks which stand recorded as mine failures.

Investors excuse their part of the scheme by saying "it has cost us much more than was estimated would carry the works through," etc. Are the men to stand the brunt of such miscalculations? They always fail to discount the enticing calculations of "ore in sight" and add a fair percentage on "estimated costs" for safety.

It is to be hoped that the owners will yet give the Henrietta mine a fair chance.

PRESCOTT, ARIZ., May 10th.

The Failure of the Harveyized Armor Plate.

EDITOR ENGINEERING AND MINING JOURNAL:

Sir: The importance of the failure in the recent armor-plate tests at Indian Head on May 19th ought to be fully understood by every one taking an interest in the welfare of his country. The large amount of the people's money that will eventually be wasted, should our present system prove a failure, is certainly startling, but is secondary in importance to the other risks involved.

Previous tests with Harveyized nickel-steel plates have sufficiently proved their merits, but these successful experiments will count for little when compared with the present failure. If the defects of the plates

could be detected by sight, touch or other elementary tests, the government officials would have rejected the one in question; but they did not and thereby showed that they considered the plate to be one that could safely be used. Now, who will guarantee that no more defective plates could be found among the rest of the lot? One or more additional ballistic tests on the same lot will surely be made. If successful could they furnish a guarantee that no more defective plates are among the lot? Looking at the situation from this point of view, it will be of the greatest importance to discover the causes of the failure and find a remedy.

The Harveyized nickel-steel is simply an alloy consisting of steel, nickel and chromium, nickel being added to increase the toughness, and chromium to increase the hardness, of the material. Theoretically, no objections could be raised, but as chromium is exceedingly brittle, counteracting the effect of the nickel, and at the same time very hard to melt, a lack of uniformity in the plates is almost unavoidable. Parts of the plates will have a higher percentage of chromium than the one intended. If we can add another metal, capable of imparting to steel its hardness without annulling the effect of the nickel, the ideal composition for an armor-plate will have been found. Fortunately, there exists such a metal, which metallurgists call tungsten. With steel, and even wrought iron, any degree of hardness can be obtained without impairing the effect of the nickel. Tungsten is more fusible than chromium, and a more uniform mixture can be obtained, but even if it were not so, slight irregularities would not involve, I believe, such risks as are necessarily due to the use of chromium. In this case slight differences in hardness would be the only effect. Tungsten has been used in every kind of steel where at the same time hardness and toughness are called for; from the famous Damascus steel to our best tool and cutlery steels, all contain it in a greater or lesser amount, and its applicability to the manufacture of armor-plates is obvious. There are strong reasons also, it is said, for attributing the excellence of Krupp's armor-plates, whose composition is kept a secret, to the use of this metal. Many more facts could be presented in favor of tungsten did space limits permit.

It is true that experiments with tungsten in armor-plates have never been made in this country, but the national interest, it seems to me, imperatively demands that they should be made. If, contrary to all expectation, they should fail, no harm would result; but if successful, an immense benefit would be derived therefrom for the nation.

F. C.
NEW YORK, May 24, 1894.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

Specially Reported for the Engineering and Mining Journal.

SUPREME COURT OF PENNSYLVANIA.

Construction of Oil and Gas Lease.

An oil lease for the purpose of drilling and operating for oil and gas for two years, and "as much longer as gas or oil is found in paying quantities, or the rental paid thereon," provided that the lessee should commence a well within 90 days, and complete it in 90 days, or, in default, pay an annual rental of \$60 until such well should be completed; that a failure to complete it or pay such rental within ten days after the time specified should render the lease void; and that it should be optional with the lessee at any time either to drill the well, to pay the rental, or forfeit the lease. The lessee, who did no drilling for oil or gas during the two years, could not hold the premises after the two years by paying the \$60 annual rental.—*Western Pennsylvania Gas Company v. George*, 28 At. Rep., 1004.

SUPREME COURT OF NEW YORK.

When Action to Foreclose Lien is Commenced.

The laws of 1880 provide that "an action" to enforce a mechanic's lien on an oil well shall be commenced, and proceedings had, "in the same manner and to the same effect as in actions" to enforce liens under laws of 1854. The act of 1854 provides that actions thereunder shall be commenced by serving a notice. The Code of Civil Procedure provides that an attempt to commence an action is equivalent to commencing, when the summons is delivered to the sheriff, and Section 414, subdivision 4, provides that the word "action" is construed, when necessary, as including a "special proceeding." It was held that Section 399 applies to a proceeding to foreclose a lien under the act of 1880, whether it is regarded as an "action" or "special proceeding," and it will be deemed to have been commenced when notice is delivered to the sheriff for service.—*Gee vs. Torrey*, 28 N. Y. Sup., 239.

SUPREME COURT OF KANSAS.

Right of Granting Injunction.

The act authorizes the granting of injunctions restraining the mining of coal by unauthorized persons on the lands of another, and authorizes the county surveyor to survey coal mines to ascertain the facts in relation thereto. The remedy afforded by the act is an injunction. There is a practical difficulty in the way of finding out whether one's rights are in fact invaded, because of the depth under the surface at which a mine is worked. But, whatever these difficulties may be, it is clear that the courts and officers of Kansas cannot invade the soil of Missouri for the purpose of gaining information concerning trespasses supposed to be committed on property situated there. The fact that access is gained through an underground passageway by the trespassers does not have effect to draw that part of the mine which is located in Missouri under the jurisdiction of the courts and officers of Kansas. Nor is a fruitless survey necessarily ending at the State line, authorized by the statute.—*In re Carr*, 15 Pac. Rep., 818.

SUPREME COURT OF MONTANA.

Procedure for Location and Acquisition of Claim.

A location of a quartz lode claim is made by complying with the requirements of the laws of the United States and of the Territory or State of Montana, and such requirements are as follows: There must be discovered within the limits of the claim located a vein or crevice of quartz or other rock in place, bearing gold, silver or other precious metals, and the vein or crevice must have at least one well-defined wall rock. The location

must be so well and distinctly marked on the ground that its boundaries can be readily traced. And within 20 days after making the location the locator or locators must file and have recorded, in the office of the county recorder of the county in which the claim is situated, a declaratory statement, on oath, containing the names of the locators, the date of the location, and such a description of the claim located, with reference to such natural objects or permanent monuments as will identify the claim. The claim located may equal, but cannot exceed, 1,500 ft. in length along the vein, and 8,000 ft. in width on each side of the center of the vein. The locator or locators must be citizens of the United States, or must have declared their intention to become such.—Mattingly vs. Lewiston, 35 Pac. Rep., 111.

TEST OF THE "INDIANA'S" SIDE ARMOR.

Specially Reported for the Engineering and Mining Journal.

The trial of the 18-in. side armor for the battleship "Indiana," which took place at the Government testing grounds at Indian Head, on the Potomac, 28 miles below Washington, on Saturday, May 19th, resulted in a surprise for both the Bethlehem Iron Company, which made the plate,

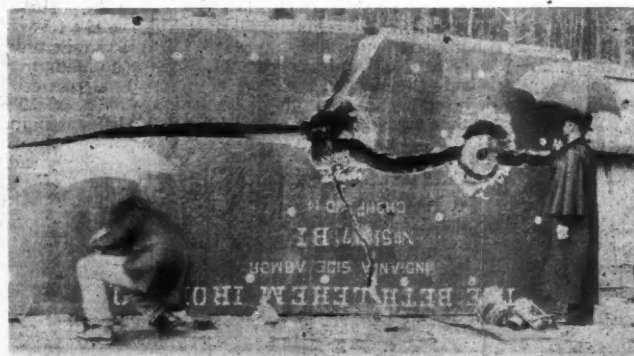
an inch by the force of impact. The plate was badly cracked through the upper, or 18 in., part, vertically above and below the hole, and transversely to the top. An examination of the fracture showed the metal to have a close and homogeneous grain, and excepting in one part, above the shot hole, where it had a slightly bluish color, showing no signs of hidden flaws. It was noticeable that the result of the Harveyizing process was not apparent more than an inch or so in from the face, whereas in the thinner plates it can be detected sometimes for several inches. The resistance of the plate was sufficient to prevent the shell from penetrating more than 2 in. into the backing.

The second shot was aimed to the right of the first, about midway between it and the bottom of the plate. The projectile was the same weight as before, but a charge of 419.3 lbs. of powder was used, giving a velocity of 1,926 ft. per second. The effect of this was to continue the transverse crack, breaking the plate into three pieces. The projectile penetrated about 6 in. into the backing, but was completely destroyed, its point being welded into the plate, while the butt, which appeared twisted off, lay in two pieces at the foot of the plate.

The conclusions which may be drawn from the test vary. Mr. Carpenter, the manufacturer of the shells, says that he considers the result a complete victory for his shells, since they have accomplished



THE PLATE AFTER THE FIRST SHOT.



THE PLATE AFTER THE SECOND SHOT.

and for the testing board representing the Government. While this was the first trial of any Harveyized nickel-steel plate of this thickness, it was not expected that the results would prove less satisfactory than those attained by the thinner plates.

The original intention was to fire two 12-in. Carpenter projectiles, and follow these with a shot from the 18-in. gun, but the first two shots wrecked the plate so completely that the latter was not possible. The illustrations accompanying this show the condition of the plate (which is lying on its side) after both the first and second shots. The length was

what has never been done before—that is, penetrated a Harveyized nickel-steel plate and entered the backing. The Bethlehem people claim that this plate gave some signs of an interior defect before it was sent, and will ask for a trial of another. They and Dr. Harvey state that the shot-resisting power of the plate is fully demonstrated, and had the cracks not been induced by this flaw the projectiles would have had no greater effect than previous tests have shown on smaller plates. One of the naval officers who was present gave it as his opinion, unofficially, that the plate was a fair sample, since, had it possessed any actual flaw, it would have been rejected by the inspector, and the presumption that a hidden flaw existed here justified the belief that they might exist in other plates whose acceptance depended upon the result of this test.

While the process of Harveyizing is easily applicable to smaller plates, this test leaves it an open and even doubtful question if it can be applied to those of such large sizes. The results are not by any means conclusive, but they give good grounds upon which to base a reasonable doubt. If the Testing Board determines to give the lot of plates another trial, the result may be looked upon as conclusive should it agree with the one just recorded.



SOME OF THE PROJECTILES USED.

16-ft.; height, 7½ ft., and thickness from top to middle, 18 in. From this point it tapered to 8 in. at the bottom, the middle corresponding with the water line on the ship. The projectiles were Carpenter shells which have been subjected to such exhaustive trials by the government recently, each weighing 850 lbs. The gun was 360 ft. distant from the plate.

The first shot was with 269½ lbs. of Dupont's brown prismatic powder, and recorded a velocity of 1,465 ft. per second. The shell struck fairly in the center of the plate, and then rebounded a distance of about 40 ft., practically uninjured, except that the softer portion was upset a fraction of

German Mining Wages.—The following statement gives the average daily wages of persons engaged in coal mining in different districts in Germany for the last quarter of 1893; the rates have been converted into American currency:

	Upper Silesia.	Lower Silesia.	West-phalia.	Saar-bruck.	Aachen.	Halle.
	c.	c.	c.	c.	c.	c.
Av. all persons.....	59.3	60.0	78.8	83.3	70.3	62.5
Miners.....	66.0	64.5	89.0	94.5	79.0	71.0
Others underground..	60.3	62.8	65.0	63.0	63.0	62.3
Surface, men.....	53.8	54.5	67.8	70.3	61.5	58.0
" boys.....	21.0	23.5	28.0	25.4	24.5	31.8
" women.....	22.3	30.8	....	....	30.5	32.5

These figures give the average net daily wages, after all deductions have been made for accident, sickness and pension funds.

Electric Generating Station at Tivoli.—In a lecture delivered by Prof. J. A. Fleming at the Royal Institution the following description was given of a plant used in transmitting 2,000 H. P. from the Falls of the Anio, Tivoli, for 18 miles over the Campagna to Rome: From the upper levels of the Anio an aqueduct has been led which delivers water to the top of an iron pipe 150 ft. above the power-house. This power-house is placed about halfway down the declivity on which are situated the famous cascades of Tivoli. The pipe is about two meters in diameter and can deliver 100 to 150 cu. ft. of water a second with a head of 150 ft., or nearly 2,000 H. P. The water is conducted to a series of nine Girard turbines, six being of 850 and three of 50 H. P. The six larger ones are directly connected with Ganz alternators, which generate a current of electricity at a pressure of 6,000 volts, while the three smaller ones are used to drive the exciters. The current is conveyed to Rome by four cables carried on 760 posts, which are placed in a straight line across the Campagna. Outside the Porta Pia at Rome it enters a transformer-house, where its pressure is reduced from 5,000 to 2,000 volts. Part is then used for arc lighting in the streets of Rome, and the rest is distributed by underground cables to various other centers, where it is again transformed down to a pressure of 100 volts for use in houses. About 20,000 incandescent lamps are thus supplied with current.

VARIATIONS IN THE MILLING OF GOLD ORES.—X. GRASS VALLEY, CALIFORNIA.

Written for the Engineering and Mining Journal by T. A. Rickard.

(Continued from page 461.)

Copyright, 1893, by the Scientific Publishing Company.

From the bottom of the screen there is a drop of 6 in. to the battery plate. The latter is 4 ft. 2 in. wide, and extends for 18 in. It is held in an iron frame (D E) which is bolted to the mortar. From the battery plate the pulp passes into a trough (T), then through a distributor consisting of a vertical iron partition pierced by 20 holes, each $\frac{1}{4}$ in. There then follows a drop of 3 $\frac{1}{2}$ in. to the apron plate. The apron is 4 ft. 5 in. wide for a length of 2 ft. 6 in., then it becomes beveled for the remaining length of 2 ft., and decreases to a width of 22 in. before discharging on to the sluices. The apron has a slope of 1 $\frac{1}{2}$ in. per foot. The sluices are 22 in. wide and 12 ft. long, and have a slope of 1 in. per foot. They deliver the pulp to shaking tables (lined with copper) of the Rittinger type. In the case of two batteries, however, these tables have been thrown out, the narrow sluice plates have also been discarded, and instead the apron has been extended at almost its full width, making a total length of 16 ft., of which the first 2 $\frac{1}{2}$ ft. is 53 in. wide and the remainder 46 in. The change was made after my first visit to the mill in 1886, when it appeared to me that the bad arrangement of the amalgamating tables was a very great blemish of an otherwise splendid milling plant. The manager tells me that the alteration is a decided improvement. The accompanying photographs* will illustrate the old and the new arrangement as run side by side. The accompanying sketch, Fig. 3, shows the outlines of the plates, contrasting the old and the new style by indicating the former in dotted lines.

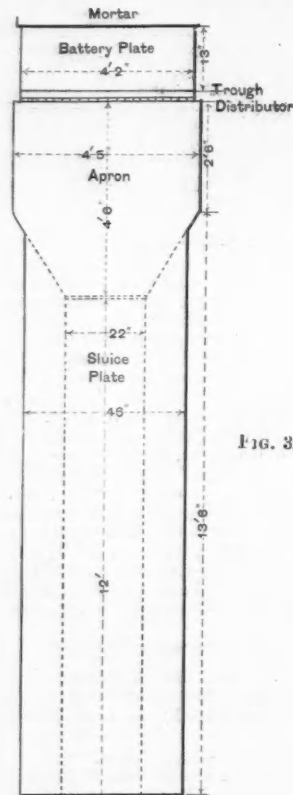


FIG. 3.

AMALGAMATING TABLES AT THE NORTH STAR MILL (NO. 3)

Needless to say the change which has been made is a step in the right direction. Even now, however, the diminution in width from 53 to 43 in. appears to me to be a mistake. The width should increase rather than the contrary, for the same amount of pulp and water passes over the lower plates as over the upper; and the gold to be caught by the lower end of the tables is more fine and more readily carried away than that which is caught at the top. I noticed that in the case of the narrow (22 in.) sluices the amalgamating surface had been rubbed off (scoured) at the sides, exposing the naked copper; thus proving the increased friction due to the more rapid flow of the pulp, caused by its confinement to so narrow a space. How does the millman expect to catch fine gold under such conditions?

The pulp from the amalgamating tables is distributed to the concentrators arranged on the lower floor. It is interesting to note that the experience at this mill is in accord with that of the other plants in this district, namely, that the Frue vanner requires less attention and gives less trouble than the other endless belt concentrators. It is stated by the manager that at this mill, if all the machines were of the Frue pattern, the mill labor would be decreased by one man per day.

Mercury is added to the ore in the battery at the rate, of from one-quarter to one full teaspoonful every hour. Upon weighing several of these teaspoonfuls they were found to average 2 oz. troy. The

* Which I owe to the kindness of Professor Christy, of the University of California

amount to be added to the ore is judged by the appearance of the amalgamating tables. If the amalgam is very soft and the mercury tends to separate out in globules, then it is clear that the amalgam is more than saturated, and the millman diminishes his dose. If, on the contrary, the amalgam is dry, that is, becomes hard and lumpy, it is evident that more mercury is required.

The proportion of amalgam obtained respectively inside and outside of the mortar varies from time to time, and is dependent upon the richness of the ore, its hardness and grain, the fineness of the screen and the changing depth of discharge. The following figures will illustrate this fact. When there were obtained outside of the battery, on the amalgamating tables, 757, 764, 747, 261, 258, 618, 205 and 200 oz. of amalgam, there were cleaned up, from the battery residues and inside plate, the following corresponding amounts: 628, 1,811, 1,030, 459, 456, 1,640, 741 and 732 oz. The mean ratio is, therefore, two to one in favor of the inside.

The amalgam retorts about 40%. That obtained from the tables has an average value of \$6.27 per oz., equivalent to a gold percentage of 35. That which comes from the inside of the battery is usually worth \$8.20 per oz., equivalent to 47% gold. Thus, for instance, from 764 oz. of amalgam obtained from the outside plates there were obtained 274 oz. of retorted gold, which on melting gave 269 oz. of clean bullion. Similarly 1,811 oz. amalgam from the inside clean-up gave 795 oz. retorted, or 784 oz. melted, gold. The bullion is worth on an average \$17.60 per oz., equal to a fineness of 0.851. In 1892 ten flasks of mercury were consumed in the treatment of 15,360 tons of ore; this is at the rate of 14 $\frac{1}{2}$ dwts. per ton.

The general clean-up is bi-monthly. The inside plates are not touched save at that time. The outside plates are scraped and dressed every morning. The fortnightly clean-up is commenced at 8 a. m. and is completed by 2 p. m. Each battery of five heads is stopped in turn. The dies are taken out, and the residues are fed into the one particular mortar which is the last to be cleaned up. The final accumulation from this battery is removed in buckets, and washed in an ordinary prospector's pan. The iron chips, from the abrasion of the shoes and dies as well as from that of the drills which are used underground, are removed by a magnet. The headings obtained from the washing of the battery residues are then treated in a small grinding pan—28 in. diameter and 9 in. deep—provided with a false bottom 2 in. thick. The rich residues are subjected to slow grinding, quicksilver being added to collect the gold as it is liberated. The resulting amalgam is removed and washed in warm water. The tailings from the pan are introduced into a barrel whose outside measurements are 2 ft. diameter and 3 ft. 9 in. length. No more mercury is added, there being already sufficient for the purpose in the pan tailings. Pieces of scrap iron, generally in the form of old nuts, bolts, etc., are added in order to serve as grinders. Cold water is used.

The North Star mill is managed in a very economical and sensible way. Six men compose the total force employed in 24 hours. The following details will be of service:

1 head amalgamator, by day.....	\$125	per month, 12 hour shift
1 assistant " " night.....	100	" " " "
1 rockbreaker man " day.....	75	" " " "
1 mechanic by day.....	2.25	per shift " " "
2 concentrator men, day and night....	3.00	" " " "

The last three on the list are included in the force attending to the concentration. Their united wages average \$220 per month.

Water power costs at the rate of 18 cents per inch. The following figures, given to me by the superintendent, will indicate the distribution of cost:

Year.	1888.	1889.	1890.
Amount of ore crushed.....	17,289 tons	20,525 tons	14,414 tons
Total costs.....	\$13,326	\$14,793	\$12,144
Cost per ton.....	77 cents	81 cents	84 cents
Details of General Cost:			
Water.....	\$5,230.36	\$6,397.75	\$4,343.00
Supplies.....	2,740.43	4,329.47	2,375.31
Labor.....	5,355.40	6,066.17	5,425.80
Details of Supplies:			
Mercury.....	\$508.50	\$609.80	\$607.25
Shoes and dies.....	1,183.40	2,562.28	869.61
Other mill castings.....	260.79	479.97	69.74
Screens.....	158.00	169.32	173.52
Sundries.....	629.74	470.10	655.19
Details of Labor:			
Concentrators.....	\$2,527.25	\$2,560.50	\$2,377.00
Amalgamators.....	2,112.00	2,559.17	2,238.80
Rockbreaker.....	711.15	946.50	810.00
Sundries.....	5.00		

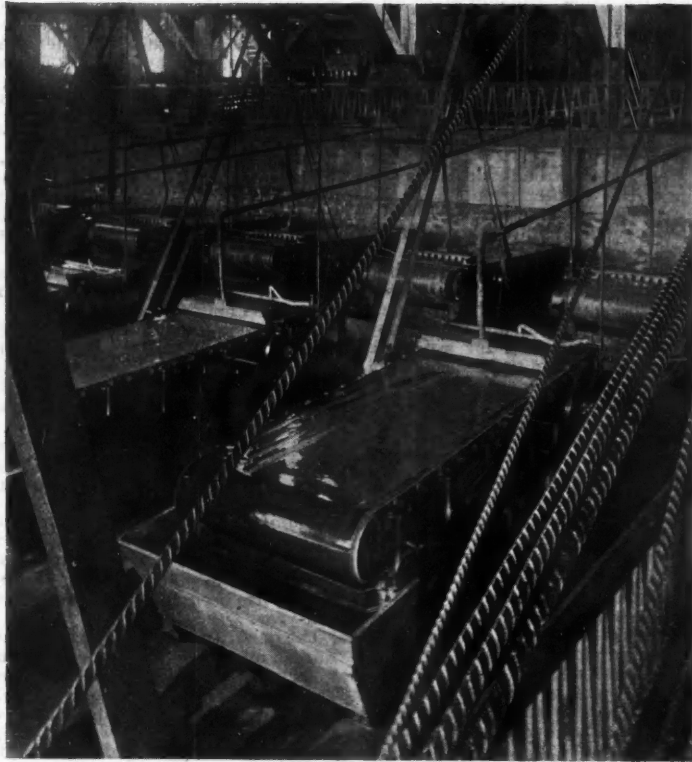
The mean average figures for this period of three years are as follows: The total cost per ton is 81c., made up of the three items: water, 31c.; supplies, 18c.; and labor, 32c. For mercury, the cost was 3.38c. per ton; shoes and dies, 8.84c.; mill castings, 1.55c.; screens, 0.95c.; and sundries, 3.56c. In the matter of labor there is the following distribution: Rock-breaking, 4.73c.; amalgamating, 13.23c.; and concentrating, 13.53c. It is interesting to note that the labor cost in the concentration department exceeds that of amalgamation. While these figures do not by any means come up to some which are often quoted to show how cheaply gold ores can, under favorable circumstances, be worked, yet having due regard to the conditions obtaining at the North Star mine they are undoubtedly excellent. The ore and its encasing rock are of more than usual hardness, and this fact prevents that rapid crushing and minimum wear and tear which help so much to reduce the costs of treatment at other mills.

The Empire mill is the older plant, having been erected in 1883. It treats the ore of a mine, which has been a very steady and large producer. There are 40 stamps arranged in eight batteries of five heads. Each stamp weighs 850 lbs. and drops 90 to 95 times per minute through a height of 7 in. Each battery crushes $\frac{7}{8}$ tons per day, being at the rate of 1 $\frac{1}{4}$ tons per stamp. The ore is very hard. Two rock breakers and eight Challenge ore feeders are employed. A 5-ft. Pelton wheel supplies the motive power. It is under such control that the entire mill can be stopped in 15 to 20 seconds.

The depth of discharge varies from 3 $\frac{1}{2}$ to 5 in. The tendency of late has been to diminish it because the mine has been unable to produce ore of such a high grade as formerly, and economical reasons made fast crushing necessary. The discharge has been gradually reduced from 6 in. to an average of 4 $\frac{1}{2}$ in. As the dies wear down old dies are placed underneath, so as to maintain the height of the issue within certain limits.

Formerly iron plates were used as false bottoms, but they were found to break too often. In order to further regulate the discharge wooden cleats are fixed to the bottom of the front of the screen. As the dies wear down they are removed. The chuck-block or wooden wedge to which the single amalgamating plate is attached has a straight face. Originally it was convex, but this was found to bring the plate too near to the stamp and to

From the mortar the pulp passes out upon the amalgamating tables. The battery plate is 4 ft. 2 in. wide and 2 ft. long. It has a slope of $2\frac{1}{2}$ in. per foot. The apron, which follows, has a width equal to that of the battery plate, but it narrows to 4 ft. and then is bevelled so as to diminish to 2 ft. The gradient is $1\frac{1}{4}$ in. per foot. The sluices are 2 ft. wide and 12 ft. long. They slope at the rate of 1 in. per foot. All these amalgamat-



NORTH STAR MILL, AMADOR COUNTY, CAL.

injure its surface. The plate is 4 ft. 2 in. long by 4 in. wide. It is of plain copper.

Of the total amalgam obtained in the mill an average of 75% comes from the inside of the mortar. The variation is between 50 and 85%. The tendency of late years has been to increase the proportion saved inside the battery by using finer screens.

ing tables are covered with silver-plated copper having $2\frac{1}{2}$ oz. of silver per square foot of copper.

The pulp then goes to the concentrators—16 Triumph machines. It is said that they give more trouble than the Frues, but it must be added that at this mill the introduction of the Triumph concentrator was due to the result of a test extending over 60 days made between the Frue and



NORTH STAR MILL, AMADOR COUNTY, CAL.

Until lately brass wire-cloth screens, 30 and 40 mesh, were used, but they have been replaced by perforated tin plate of an equivalent fineness. The surface of the tin plate is smoked on the blacksmith's forge, the idea being that this will prevent the adhesion of amalgam. The tin wears off in about a week. The brass wire is said to cost at the rate of \$1.55 per screen and to give a service of 25 working days, while the tin plate screens cost 55c. each and last for 15 days.

the Triumph. As is often the case, however, in these matters, the trial was not altogether conclusive, because it is claimed that the result was largely due to the superior skill of the man who had charge of the working of the Triumph.

The concentrates have a gross value of from \$75 to \$300 per ton. The average is from \$75 to \$100. The yield of sulphurets is at the rate of 2 to 2½%. The clean-up is made bi-monthly. It is begun at 6:30 a. m., and

the amalgam has been retorted and the gold melted by 4:30 p. m. Any replacing of new for old shoes and dies, if required, is done at this time. This mill employs chrome steel for both shoes and dies. When the supply of steel runs short cast iron from the local foundry is used in its place. The service of the chrome steel is very good, giving a regular and even wearing surface. There is no marked difference to be noted in this respect between the chrome steel and the local castings, the former being more expensive, but wearing longer than the latter. The mill men prefer the steel because its longer time of service necessitates less frequent changes to be made, and therefore gives them less labor.

The mill, including the concentrators, uses from 12 to 15 miner's inches of water. This is equal to 4 gals. per stamp per minute. Each Triumph takes 1½ gals. per minute of water, in addition to the battery water accompanying the pulp. From 40 to 50 lbs. of mercury are consumed in crushing from 1,400 to 1,500 tons of ore. This is equivalent to 9 dwts. Troy per ton of ore treated.

In leaving the mill the tailings are passed through an automatic sampler which takes six samples per hour. It is the invention of Mr. Starr, the former superintendent, and appears to be an excellent device.* The results indicate that the mill saves from 85 to 87% of the gold in the ore. The tailings rarely contain less than one dollar per ton.

The W. Y. O. D. (Work your own diggings) is a new mill, having been erected in 1890. It contains 10 stamps weighing 750 lbs. each. The speed is regulated at from 90 to 100 drops per minute. The drop varies from 5 to 7 in. The depth of discharge has a minimum of 4 in. and a maximum of 6 in. The dies, which are made of cast iron, are used for six weeks and then discarded. This prevents a wide difference in the issue. Chrome steel shoes are used and give excellent service.

The mill is provided with one rock-breaker (Gates) and two (Handy Challenge) automatic feeders. The crushing capacity is at the rate of 510 tons per month of 30 days. This is the only mill in Grass Valley which works on Sundays.

About one-half of the amalgam obtained from the inside of the mortar is taken from the one amalgamating plate, which is 4 ft. long and 4 in. wide. Of the total saving of the mill by amalgamation two-thirds come from the mortar. The tendency is to endeavor to increase the importance of this inside amalgamation. The amalgamating tables consist of one surface 50 in. wide and 14 ft. long. It has a slope of 1½ in. per foot and is plated with 5 oz. of silver per square foot of copper.

Brass wire-cloth screens of 40 mesh have been replaced by perforated tin plate. The latter give a service of 14 working days. They are considered to wear more uniformly than the wire cloth, the brass of which becomes amalgamated at the edges and so weakened.

The pulp from the table goes to four Frue vanners, which extract 2½% of concentrates worth from \$60 to \$275 per ton, the average being about \$100 gross. They are sold to the local chlorination works, which charge \$16 per ton for treatment and hauling. About 90% of the gold value is returned, the silver being negligible.

Three flasks (each 76½ lbs. avoirdupois) of mercury are consumed in crushing 6,000 tons of ore: This is equivalent to 11 dwts. per ton. The water used in the mill amounts to 2½ miner's inches, being at the rate of 3 gals. per stamp per minute.

The mill is run by steam power. The plant is small but very sensibly designed. The tailings are said to contain an average of \$1.10, being equivalent to a saving of from 87 to 90%.

The Idaho mill is a very old plant, belonging to a famous old mine and has undergone frequent alterations. The figures given in the comparative table indicate that it works on lines similar to the Empire mill.

(To be continued.)

ABSTRACTS OF OFFICIAL REPORTS.

ALASKA-MEXICAN GOLD MINING COMPANY, ALASKA.

This company, organized in 1892, bought the Mexican mine on Douglas Island, in Alaska. Its report for the year 1893 shows chiefly work done in putting the old mine in order, building a new mill and developing the property generally. The capital stock of the present company is \$1,000,000, of which \$245,000 (49,000 shares) is held in the treasury. The sum of \$600,000 (120,000 shares) was paid for the property, and 31,000 shares have been sold. The total expenditures for organization, new plant, supplies, etc., up to the close of 1893 were \$212,772.

The report of Mr. Robert Duncan, superintendent of the mine, shows, up to the close of the year, 1,625 ft. of development work. The average value of the ore so far opened up was \$5.20 per ton, as nearly as could be determined by assays. The superintendent estimates a total of 850,000 tons of ore in sight. The work done on the plant is described as follows:

"A 60-stamp mill (of 1,020 lbs. each stamp), Fraser & Chalmers, was built during the year and furnished with power arranged to be driven by Corliss engines or Pelton water wheel. The Pelton wheel is a special 5 ft. 10 in. and driven by water under 420 ft. head. The Corliss engines are the latest improved type, Fraser & Chalmers' compound condensing, 16 in. and 26 in. by 42 in. stroke, operating at 85 revolutions per minute. To furnish steam for the mill engines there was put in place a battery of three Fraser & Chalmers' 54 in. diameter, 16 ft. long tubular boilers, which work at a pressure of 120 lbs. per square inch. Alongside of the boiler plant, coal bunkers were built, which will carry about 850 tons of coal, or enough to supply the mill for about four months. A railroad was built from the mill, mine and coal bunkers to the Alaska-Treadwell company's wharf. It is about 4,500 ft. long and is built on a trestle the entire length, to prevent it from being snowed under during the winter. Over the main tunnel are placed two Comet crushers, also a double platform Reedy safety worm-gear elevator, by which the ore from the mine is hoisted a distance of 100 ft. and dumped into the Comet crushers, from which the ore is run to the mill. The Comet crushers are giving excellent results and will do 50% more work than the makers guarantee. The crushers and elevator are driven by a special 41-in. Pelton wheel, or can be driven by the mill engine, at will. The electric light plant consists of one Edison incandescent 210-light machine, driven by a

* I am indebted to Mr. Starr for his courtesy in affording me information. The automatic tailings sampler will be found illustrated in Mr. Hammond's article referred to in a previous note.

No. 4 Pelton motor, which gives very satisfactory results. The canal for water supply is over four miles in length and is built along the side of the mountain to the different creeks, at an elevation of about 420 ft. above the mill, and is expected to furnish water for power for the entire plant during about seven months of the year. The pipe line is about 2,700 ft. long, and is made of No. 8 tank steel, and Nos. 10 and 12 iron, is 12, 14 and 15 in. in diameter, and connects the mill with the penstock at the lower end of the canal on the mountain side. The entire line is laid in a trench from 2 to 4 ft. deep, and is now packed with moss and covered up for protection from cold weather in winter. An 18 by 30-in. compressor of the Riedler type, built by Fraser & Chalmers, is put in place and actuated by water, or by a Corliss condensing engine, 16-in. by 30-in. This compressor has capacity enough for ten ¾-in. Sergeant drills."

SIERRA BUTTES GOLD MINING COMPANY, CALIFORNIA.

The latest report of this company, presented to the yearly meeting of the stockholders in London, recently, covers the half-year ending December 31st, 1893. The company works the Sierra Buttes, the Plumas-Eureka and the Uncle Sam mines, the accounts of which are kept separately. The profits of the Uncle Sam are divided between the other two mines, as shown below.

Sierra Buttes Mine.—The total balance of profit from this mine for the half-year was £2,078, to which is added £3,858 half profit from the Uncle Sam mine, making a total of £5,936. From this £2,000 was carried to reserve fund and a dividend of 6d. per share paid, amounting to £3,063; leaving a balance of £873 to current half year. The quantity of ore taken out of the North Cliff levels was: No. 3 level, 820 tons; No. 3½ level, 970 tons; No. 4 level, 1,870 tons; total, 3,660 tons. The Reis mill was in operation 183 and crushed all ore produced, the total value of gold extracted being \$20,287. The average yield of the ore was \$5.54; cost of working, \$1.92; profit, \$3.62 per ton. No prospecting work is being carried on in the mine, and the supply of ore was from pillars left by former owners as being too poor to pay for working. How much longer these pillars will last it is impossible to say.

Plumas-Eureka Mine.—The profit and loss account of this mine for the half-year shows a balance of £862, which, with £3,858 half profit of Uncle Sam mine, and the balance brought forward from previous half-year, makes a total of £8,968. From this a dividend of 9d. per share, £5,273, has been declared, leaving £3,695 to carry forward to the current half-year.

The quantity of ore produced in the half-year was as follows: Plumas-Eureka mine, Jenkins tunnel and Murton drift, 735 tons; Hosking vein, 8,530 tons; Wright's veins Nos. 2 and 3, 6,775 tons; total, 16,040 tons. The Mohawk mill was in operation 183½ days, with an average of 34 stamps running, and crushed 16,030 tons of ore, from which gold was extracted worth \$60,097. The average yield of the ore in free gold was \$3.75 per ton, as compared with \$3.54 in the previous half-year, and the proportionate yield of the sulphurets saved was \$0.18, making the total yield of the ore \$3.93 per ton. The cost of mining, prospecting, etc., was \$2.79 per ton, the cost of milling \$0.35½, and the cost of treating the sulphurets per ton of ore milled \$0.06, making the average working cost \$3.20½ per ton, as compared with \$3.16 in the preceding half-year. The quantity of sulphurets saved was 227 tons, and 400 tons were treated at the tailings works. The gold extracted amounted to \$5,102, an average of \$12.75½ per ton, and the profit on the working was \$3,379.

The Jenkins tunnel, situated about 460 ft. above the railroad tunnel, has a total length of 786 ft.; and at a point about 500 ft. from its mouth Doney's raise was put up 172 ft. The vein at the start was about 2 ft. wide and worth \$4 per ton, but it soon contracted in size to a few inches, and disappeared at a height of 35 ft. from the tunnel. About 220 ft. farther in, or 720 ft. from the mouth of Jenkins tunnel, Humphrey's raise was started and put up 167 ft., and carried a vein all the way 2½ to 3½ ft. wide, but the quality was poor. From the top of Doney's raise, Murton's drift was driven north to the surface, and south to and beyond the top of Humphrey's raise, making together a length of 434 ft. On Wright's No. 3 vein a drift was run 36 ft., the vein being 4 ft. wide and worth about \$4 per ton. An incline sunk 87 ft. showed a vein from 2 to 4 ft. wide, carrying from \$5 to \$6 per ton for 60 ft., and then declining slightly in value. This is new ground and is considered promising.

Uncle Sam Mine.—This mine showed for the year a profit of £9,716, of which £2,000 was carried to reserve fund and the remainder divided, £3,858 to Sierra Buttes and £3,858 to Plumas-Eureka account. The quantity of ore taken out of the mine during the half-year was 10,162 tons, 1,820 tons of which came from the North vein, and 8,342 tons from the South vein. The quantity of ore milled was 10,149 tons, which yielded free gold to the value of \$91,597, an average of \$8.98 per ton. The proportionate yield from the sulphurets was \$1.15½, making the total product of the ore \$10.13½ per ton. The average cost of mining, prospecting, etc., was \$3.04½ per ton, of milling \$0.69, and of treating the sulphurets per ton of ore milled \$0.44, making the average working cost \$4.17½ per ton. Owing to the dryness of the season steam power was used for driving the mill and other machinery for 4 months 22 days. The Huntington mill was started early in December, but owing to the short supply of water it crushed only 66 tons of ore. The quantity of sulphurets saved was 148½ tons, and 139½ tons were treated in the chlorination works. The gold obtained was \$11,090, the expenses were \$4,329, and the profit \$6,761. The average yield of the sulphurets per ton was \$79.50, the cost of working \$30.25½, and the profit \$49.26½.

The mine reports say: "The appearance of the mine has changed but little since. There have been no developments of importance made by the levels that have been run, and the quality of the vein in the various stopes has changed but little, if at all. In consequence of scarcity of water during the greatest portion of the term the compressor only furnished enough air for one power drill, and on this account less prospecting was done than in the previous half-year."

Irrigating an Indian Reservation.—Judge L. T. Erwin, agent in charge of the Indian reservation at Yakima, Wash., has procured an appropriation of \$5,000 to be used in building irrigating canals on the reservation. The labor of the Indians will be employed in the work. The reservation includes nearly 600,000 acres of land, a large part of which can be improved by water.

MACHINE FOR HOISTING MINE CAPS.

Written for the Engineering and Mining Journal by W. H. Mceller.

Some time ago while in California I planned a machine for hoisting caps which offered, in the case for which it was designed, many advantages in saving time as well as in safety. The timber used in the mine is from 22 to 24 in. in diameter. The caps from 10 to 14 ft. long, weighing 1,000 lbs. and over, requiring from 12 to 15 men to lift and place. With the machine two men performed the same work.

This machine is only applicable where there are big bodies of ore stoped without the use of the so-called "square sets" of timber, which are very often too expensive.

The average width of the ore body is from 25 to 40 ft. and more. It is stoped between the levels, which are 100 ft. distant from each other, measured with the dip of the vein. The inclination varies from 45 to 60°. The ground in each stop is taken out 8.5 ft. high, 6 ft. for post, 2 ft. for the caps, and 6 in. for the planks and wedges.

The accompanying drawing shows the system of timbering in use in the mine. Figs. A, B, C give different views of the machine when placed in its proper working position. The iron crown S is resting on a wooden frame. The two prongs n of the crown hold in position by being fastened in the last cap of the previous set. The whole machine is tied with or by a wedge either at the roof or the footpiece of the frame if needed.

The rope is attached to the drum f with one end running over the roll c and the other end fastened to the ring m. On attaching ring m to the cap it should be put around the center as near as possible in order to balance evenly when hoisted. The cap is raised to the roof in the following manner: A crowbar is put into the holes d of the drum f, then the cap is wound up. The cogwheel c, with the dog e, prevents the drum from turning back. When the cap is hoisted high

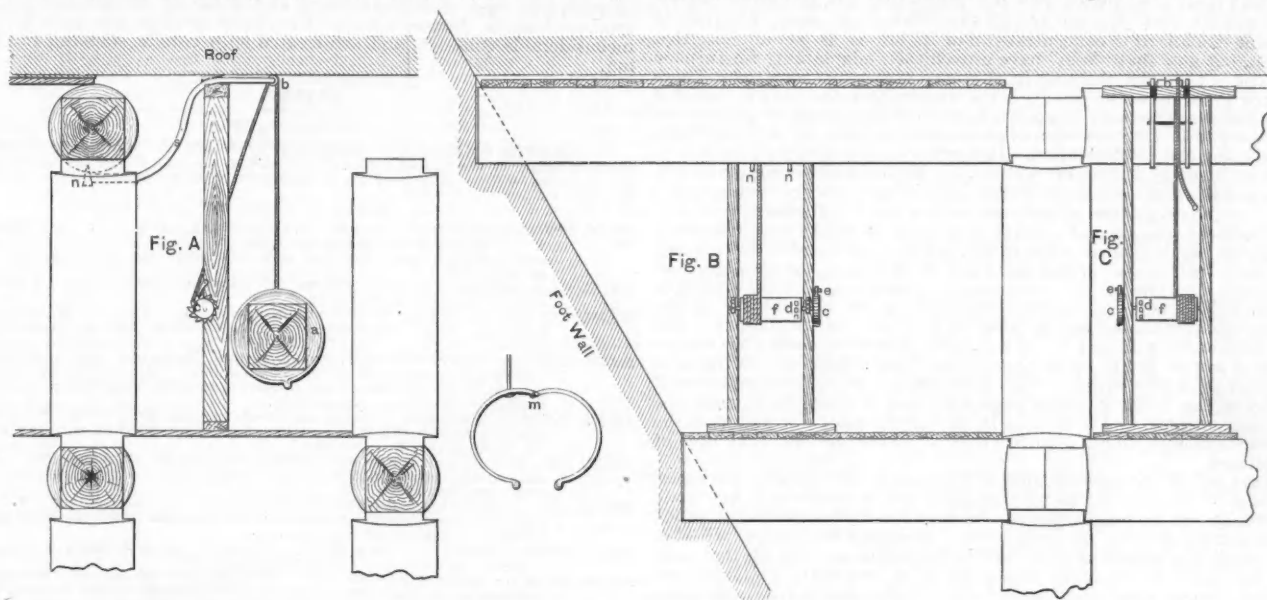
The mass of strata has been so contorted and pressed, however, that all seams of coal which may have existed in it have been squeezed out, and these vertical measures have been omitted from all calculations of area. On the southeastern side of the field there are three seams of coal above the mountain limestone (which is the base of the carboniferous strata) and below the first conglomerate. These seams do not exceed 1 ft. in thickness, and are also excluded from the calculations.

The entire area of the field exclusive of these sub-conglomerate and edge seams is estimated as a little over 150 square miles. This area is what is called the Upper or True Coal Measures.

In this series there are 28 seams of coal varying from a few inches to 12 ft. 6 in. in thickness. The base is the first conglomerate before mentioned. Above this there are three seams in about 525 ft. of strata, then comes 795 ft. of another conglomerate and sandstone, over which is about 2,890 ft. of strata containing 25 seams of coal. There is another conglomerate 80 ft. in thickness about 60 ft. from the top of the general section and these conglomerates are the guide lines or landmarks which have enabled the geologists to recognize the various seams over a large section of country where surface exposures were few. The whole thickness of the coalfield is 4,215 ft.

Of the seams discovered the following are among the most important: The Caskie, 3 ft. 8 in. thick, one of the best in the field, a good coking coal and otherwise giving satisfactory results. Being near the bottom of the section it is the most extensive seam in area. The Harris, 2 ft. 0 in., is the first seam above the second conglomerate, and has long been esteemed for its uniform excellence. The Holt or Big seam is the thickest in the section. The entire thickness is 12 ft. 6 in., of which about 4 ft. is coal interspersed with layers of clay and slate. There is also 1 ft. 11 in. of blackband and coal. This seam is probably the counterpart of the Mammoth seam of the Cahaba coalfield.

The Murray seam, 2 ft. 5 in., is a first-class coking coal. The upper bench of this seam, 13 in. in thickness, has long been known and highly



WINDLASS FOR HOISTING MINE CAPS.

enough, one end is swung into the hitch of the footwall, or, if there is a post, put on top of it. The other end cannot be put on its post, as the rope is too short to give that much play, but as the cap is raised a plank can be spiked beneath it from the post of the last set of timber, to the post of the new set, which is sufficiently strong enough to carry the cap. Ring m can now be detached and it may be slipped into its proper place. If the ring m should be too large a few wedges in the lower part will make it fit tight.

The machine can be easily constructed in any blacksmith and carpenter shop at the mines and is not patented.

COAL MEASURES OF BLOUNT MOUNTAIN, ALA.*

By A. M. Gibson.

In 1893 a thorough survey was made of that part of Blount, St. Clair and Etowah counties, Ala., known as the Blount Mountain district, for the purpose of determining to what extent it was a continuation of the Cahaba coalfield. The section of country under examination extends from Cowden Gap, near Village Springs, Blount County, in a north easterly direction to the Tennessee & Coosa Railroad, near the village of Aurora, in Etowah County. The coal bearing area is in shape somewhat like an irregular parallelogram about 40 miles in length and varying in width from three miles at either end to about eight miles in the middle. The northwestern length of the field is coincident with a mountain range known as Straight Mountain, which forms the southeastern side of Murphee's Valley.

The general dip of the strata is across the field in a N.W. direction about 10° to 12° except along the Straight Mountain, where the strata rise N.W. at an inclination of 20° to 80°. This mountain consists chiefly of vertical strata about 300 to 400 ft. in height and 1,000 ft. in width. These strata are coal-bearing, but their identity has not been definitely established, although it was thought that some of the chief conglomerates were recognizable.

* Abstract from the report on the Coal Measures of Blount Mountain, Ala., by A. M. Gibson, Assistant State Geologist.

appreciated by local blacksmiths. The lower and more important part of the seam was brought to light by the Geological Survey. It is a peculiar thing in the coals of this field that almost all the seams have clay partings about their middle. These partings are sometimes one foot or over in thickness, and have, on several occasions like the above, been mistaken for the underclay and the lower coal entirely overlooked. The Atkins seam, 3 ft. is an excellent shop and coking coal. The seam lies well for drainage and is accessible for cheap transportation. The Phillips seam, 3 ft. 2 in. thick, and the Baines seam. These two seams, which are near the top of the section, have been discovered in two different localities, and are probably one and the same. The coal is of fine quality, contains practically no sulphur, and will, no doubt, be largely used in the future for smelting and furnace work. The Bynum seam is 4 ft. 2 in. This seam has probably the largest body of solid coal free from partings of any in the field. It is a good shop coal, but its area is limited.

The Heilmann Electric Locomotive.—Some recent experiments made with M. Heilmann's electric locomotive on the railway between Havre and Benzeville were attended with good results. The electric train traveled from Benzeville to Havre at the rate of 80 kilometers an hour. The return journey from Havre to Benzeville, notwithstanding a steep gradient which had to be climbed, was effected at the speed of 100 kilometers an hour.

The Deepest Bore-Hole in the World.—The deepest bore-hole now in the earth is the one at Poroschowitz, in the Rybnik district, Upper Silesia. It has been carried to a depth of something beyond 2,000 meters (about 6,700 ft.), the diameter of the tube at the bottom is 7 cm. (2½ in.). Boring to such depths, and, moreover, through solid rock, was almost impossible prior to the invention of the Mannesmann tube; the greater strength of this tube, as compared with others, makes it possible to use tubes of thinner gauge. It is expected that a final depth of yet another 500 meters (some 1,670 ft.) can be reached, and a number of interesting observations on temperature, etc., will be made.

NORTH CAROLINA IRON ORES AND MAGNETIC CONCENTRATION.

Written for the Engineering and Mining Journal by Dr. W. B. Phillips.

In a bulletin recently issued by the Geological Survey of North Carolina, Mr. H. B. C. Nitze, Assistant State Geologist, has given us an interesting account of the iron ore deposits of that State.

The iron ores of the counties of Gaston, Chatham, Orange, Guilford and the other eastern and central portions have been known a long time, have aroused an infrequent and spasmodic interest and have finally assumed their normal position of patient waiting until the other better and more favorably situated ores have been brought into use. The North Carolina Steel and Iron Company has a good furnace at Greensboro, built in 1892, with a calculated capacity of 100 tons per day, for using the brown ore of Ore Hill in Chatham County, and possibly the magnetite of Stokes and near-by counties, but it has never gone into blast. This furnace, with the little 15-ton furnace at Cranberry, Mitchell County, upholds the dignity of the iron production of the State. The total output of ore in 1892 was about 24,000 tons, of which something over 18,000 tons came from Cranberry, and 5,000 tons from the Ormond mine in Gaston County. The total production of pig iron in 1892 was 2,589 gross tons of coke iron, high-grade Bessemer, and 312 gross tons of charcoal iron, all made at Cranberry. It may be that there are ores in other parts of the State that will become available for the furnace, but just at present, and it seems to me for some time to come, the only ores that deserve a more careful consideration are to be found in the western part of the State. They are nearer the supply of fuel, are of purer quality and the iron made from them would be nearer the only market it could reasonably hope to secure. Most of them have the present disadvantage of being remote from rail transportation and in a mountainous region where the cost of building a road would be very heavy.

The Wenstrom magnetic separator has done excellent work at Cranberry, and there is no reason why the magnetites of the same general belt should not come into use as high-grade Bessemer ores. Whether or no a mine can afford to concentrate all of its ore is as yet an unsettled question, but now that "fines" have proved their adaptability for furnace work, one of the chief obstacles in the way has been removed. There are many first-rate water-powers in the western iron ore region, some of them within easy distance of known deposits, which could be utilized for the generation and transmission of the electric current, for drilling, haulage, crushing and concentration. In a series of 23 analyses of Cranberry coke iron, made by Porter W. Shimer, the highest phosphorus given was 0.080%, and the highest sulphur 0.067%. No better evidence of the quality of some of the magnetites of the western belt can be afforded.

The highest percentage of metallic iron in run of mine Cranberry ore, is given in the report referred to as 45.93%, while the ore sent to the concentrator gave 35.48% iron. If this last result be taken as the average, and the average analysis of the concentrates passing a 10-mesh screen be taken at 67.57% iron, these figures would indicate an adaptability of the ore for concentration surpassing that of any ore in the country. The coarse concentrates (from $\frac{1}{2}$ in. to 2 in. size), however, show a maximum content of iron of 53.44%, while the tailings from coarse concentrates of 48.84% iron show 31.37% iron. With crude ore of 5% iron, concentrates of 53% and tailings of 31% it would require 5.5 tons of crude ore to make one ton of concentrates, and if the iron in the concentrates was 67%, as in the fine concentrates, it would require 9 tons of crude ore for each ton of concentrates.

In speaking of the concentration at Cranberry, Mr. Nitze in his report does not give the proportions between the yield of coarse and fine concentrates, so that no conclusions can be drawn as to the amount of crude ore required for one ton of concentrates. It cannot be inferred whether this is nearer five tons than nine, but any practice on ore of that sort which leaves 31% of iron in the tails is apt to be wasteful. So far as concerns the ultimate quality of the fine concentrates, this leaves nothing to be desired, but if this is to be obtained at the sacrifice of nearly one-third of the ore, the cost must certainly be very great. Mr. Nitze gives the cost of mining and loading at \$1.20 per ton, to which must be added at least 50c. for hauling, handling, crushing, sizing and concentrating, making the total cost of a ton of crude ore \$1.70. According to this estimate, and allowing even four tons of ore to one ton of concentrates, the cost per ton of concentrates would be \$6.80.

I cannot agree with the conclusions of Mr. Nitze's report, that the cost of magnetic concentration is about 40c. per ton of concentrates, exclusive of the cost of running and maintenance of the dynamo, although he guardedly says "it is put" at this figure. If in the concentration is to be charged the crushing, sizing and separation, I do not think that 40c. per ton of concentrates would begin to cover the cost. Magnetic concentration at 40c. per ton of concentrates has a most alluring appearance, but one should be slow to act upon the statement. This does not in any wise reflect upon the report, for the author is most careful and accurate, but it is intended merely to point out the need of caution when looking into the question of magnetic concentration. It is a most important matter, not only in North Carolina, but in other Southern States, and, while all information is welcome, conclusions based on insufficient premises are to be deprecated.

Petroleum as Fuel on Russian Railways.—It is stated that it has been decided to use petroleum instead of coal for the firing of the locomotives of the Riga Railway, and that petroleum reservoirs are to be established for this purpose at Reval, Wesenburg, Narwa, Gatschina, and St. Petersburg, capable of containing collectively 1,000,000 poods of petroleum. It is also stated that petroleum is to be adopted on the Dwinsk-Riga Railway, but this cannot take place for some time to come, inasmuch as the coal contracts for the next five years are already arranged.

New Iron and Steel Works in Russia.—There is at present being established at Constantinovka, in South Russia, large iron and steel works by a company formed in 1891, with a capital of \$2,000,000, and known as the Donetz Forges Company. The works will include a large Bessemer steel-making plant, a rail-rolling mill, foundry, forge and an engineering shop. The plant will, it is expected, be put in operation this year, and it is stated that orders have already been secured for the supply of 100,000 tons of rails to the Russian State railways during 1895, 1896 and 1897.

Manufacture of Briquette Fuel.—In a paper read by William Colquhoun before the Institution of Civil Engineers in Great Britain, the author stated that the characteristics of good pitch derived from coal tar made that agent the most suitable for use as an agglutinant. With from 8 to 9% of it, slack coal could be agglomerated into a form suitable for storage purposes, and also having as high calorific value as ordinary lump coal. Three experiments with English briquettes gave 8.41 lbs., 8.77 lbs. and 8.99 lbs. respectively as the weight of water evaporated from and at 212 degs. Fahr. per lb. of fuel. The average evaporative power of several of the best Welsh steam coals was 9.33 lbs. Careful experiments made by Mr. Marié on the Paris, Lyons & Mediterranean Railway gave as corresponding figures for three descriptions of French briquettes 8.88 lbs., 9.15 lbs. and 8.68 lbs. respectively. The mechanical preparation of the coal used in briquette manufacture receives more attention on the Continent than in England, particularly in regard to the washing and subsequent drying of the slack. These operations are necessary in order to render the poorer coals serviceable for the manufacture. At Bietrix the coal and pitch are intimately intermixed by two methods, known respectively as the melted and dry pitch processes; the pitch by the former being melted (sometimes with additions of common tar) prior to its addition to the coal, and by the latter being ground up with the coal in a dry state. In both instances the mixture of coal and pitch is subjected to the action of heat until each particle of coal is covered with a film of melted pitch, and so rendered fit for compression into blocks. In this state the mixture or paste contains from 3 to 5% of water in order to facilitate the sliding of the particles of coal one on the other during compression. The machines for compressing the paste are roughly divided into three classes, irrespective of the nature of the power employed. These classes are: First, single compression machines, as the Mazeline, Stevens and Dupuy presses; secondly, machines compressing on both sides of the briquette, such as those of Middleton, Bietrix and Veillon; thirdly, machines acting by the tangential pressure of rolls, like that of Fouquemberg, and those of the sausage-machine type, such as the Bourriez press. Briquettes hot from the press have an inconsiderable cohesion, and are treated with care in stacking and loading.

PATENTS.

UNITED STATES.

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

TUESDAY, MAY 15TH, 1894.

- 519,704. Obtaining Lead Salts from Native Ores. Ambrose G. Fell, New York, N. Y. This process consists in subjecting the ground ores to the action of an acid solution containing free sulphuric acid, and then separating the salts formed.
- 519,753. Dirt Loading Machine. Joshua M. Younger, Sloan, Iowa. A portable supporting frame and carrier.
- 519,754. Oil Burner. Charles G. Baldwin, Momence, Ill., Assignor of one-half to Frank S. Hupp, same place. A jet burner with oil and steam supply pipes.
- 519,775. Furnace Grate. William R. Roney, Boston, Mass., and Olin A. Stranahan, Chicago, Ill., Assignors to the Westinghouse, Church, Kerr & Co., East Orange, N. J. A grate of the inclined type with longitudinal bars supported by transverse rocking bars.
- 519,776. Welding Apparatus. Charles L. Rowland, Brooklyn, N. Y. A combination of a fixed cradle with movable facing furnaces and movable anvils, for welding cylindrical bodies.
- 519,779. Smoke Consuming Furnace. Joseph M. Thomas, St. Louis, Mo. A furnace of the down-draft type, with combustion chamber, in which the gases may be burned.
- 519,784. Coal Dust Firing Apparatus. Carl Wegener, Berlin, Germany. A combination of a combustion chamber with a mouthpiece for the admission of air and automatic feed for the fuel.
- 519,787. Boiler Furnace. William Brand, Pittsburg, Pa. Combination of double bridge-walls forming a combustion chamber.
- 519,814. Kiln for burning Earthenware. William H. R. Kunstman, Chicago, Ill., Assignor to the Columbian Pottery and Brick Kiln Company, same place. An annular vault with movable floors and partitions, and flues leading into a central chimney.
- 519,830. Vapor Burner. George W. Billings, Cleveland, O., Assignor of one-half to F. M. Potter, same place. A central combustion chamber with fine jet openings.
- 519,870. Magnetic Engine for Reciprocating Tools. Henry S. McKay, Boston, Mass. Combination of two or more magnets, a plunger armature and a sliding tool-holder, all arranged in a cylindrical casing.
- 519,880. Gas Engine. Hadwen Swain, San Francisco, Cal. The combination of an admission valve operated by a lever and cam, and a governor to regulate the inlet valve.
- 519,901. Process of Refining Ores. Albert E. Barton, Ensley, and George B. McCormack, Pratt Mines, Ala. A process for removing phosphorus by subjecting the ores to a high temperature in the presence of suitable reducing gases containing carbon.
- 519,902. Process of Refining Iron. Albert E. Barton, Ensley, and George B. McCormack, Pratt Mines, Ala. A process in which iron ores are submitted to a high temperature and then magnetically concentrated.
- 519,903. Machine for Cutting and Finishing Metal Strips. Theodor Brandt, Quedlinburg, Germany. A combination of a vertically movable saw with a fixed and a movable knifeholder and trimming knives.
- 519,955. Steam Shovel. Grant Holmes, Danville, Ill. A shovel of the crane and bucket type, the patent consisting in the construction and arrangement of frame, dippers, etc.
- 519,981. Flume Rifle. Samuel A. Baggs, Riverside, Cal., Assignor of one-half to J. K. Woodward, same place. The combination with a flume of a series of hinged rifle plates.
- 519,985. Metallurgical Furnace. Joseph Butler, Marion, Ind. The special features are in the arrangement of combustion chamber and air passages.
- 519,987. Apparatus for Concentrating Ores. William L. Card and Frank S. Card, St. Louis, Mo. Concentrator of the shaking tray or table type, with arrangement of perforated pipes for supplying water.
- 520,000. Mining Tool. Martin Hardscog, Ottumwa, Iowa. Combination of ax or hammer head, dovetailed slide on the handle, and locking-bolt to hold the head and handle together.
- 520,023. Brick Machine. Jefferson D. Pace, Shreveport, La. Combination of mixing cylinder, feed shaft and plunger for forcing out the clay.

GREAT BRITAIN.

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

WEEK ENDING MAY 5TH, 1894.

- 7,541 of 1893. Safety Apparatus for Pit Cages. J. T. Calow and C. H. Ha. Hersley, Sheffield.
- 7,667 of 1893. Copper Smelting Furnaces. A. O. Vicuna, Chili.
- 10,665 of 1893. Pumping Apparatus for Mines. A. B. Brown, Edinburgh.
- 11,607 of 1893. Percussive Rock Drills. A. and Z. Daw, London.
- 11,917 of 1893. Cable Haulage for Mines. Walker Bros., Wigan.
- 375 of 1894. Ore Breakers. S. Mason, Leicester.
- 4,980 of 1894. Solder for Aluminum. O. Nicolai, Wiesbaden, Germany.

PERSONALS.

Mr. L. W. Nelson is now superintendent of the Nelson Mining Company in Oregon.

Mr. W. C. Brown has resigned his position as vice-president of the Piegana Mining Company in Montana.

Mr. E. R. Armstrong, treasurer and superintendent of the United States Slate Company for some time past, has resigned, and will go into business in Easton, Pa.

Mr. J. H. Lyons, for a number of years master mechanic for the Penn Iron Mining Company at Norway, Mich., has resigned his position, to date from June 1st.

Dr. Charles R. Keyes, for some time past Assistant State Geologist of Iowa, has been chosen State Geologist of Missouri, in place of Prof. Arthur Winslow, whose retirement was recently noted. Dr. Keyes is the author of the paper on the Coal Measures of Iowa, which forms a prominent part of the first report issued by that State.

Mr. Samuel Llewellyn has been appointed mine inspector for the district consisting of the counties of Hocking, Vinton, Jackson and Scioto, in Ohio. He was born in Pennsylvania but removed to Ohio when 14 years old. He became a coal miner at 10 years of age, and he has remained a practical miner since, following that occupation all his life with the exception of the four years spent in the army and the four winters spent in the Legislature.

Hon. J. M. Burke, a prominent mine-owner of the Coeur d'Alene region, has been missing for more than a month, according to Idaho papers. He spent last winter in Washington and in Virginia, but in March left Washington for Cincinnati, intending later to go to Milwaukee and then to return to Idaho. Since that time he has not been seen, and his present whereabouts is unknown. Mr. Burke was a shrewd, active man of business and in excellent health, and there is no reason known for his disappearance; many of his friends believe that he will return after a time.

OBITUARY.

It is reported from Hermosillo, Mexico, that three American mining engineers, named Chris Winton, Ludwig Holdman and P. N. Leff, all well known in southern and western Mexico, have been killed by Yaqui Indians while on an overland journey across the Sierra Madre Mountains to the village of Guaynopita, in the western part of the State of Chihuahua, where a rich find of gold was recently reported.

SOCIETIES AND TECHNICAL SCHOOLS.

Rose Polytechnic Institute.—This school, at Terre Haute, Ind., has always been noted for its complete laboratory and workshop equipment. This is now being increased, especially in the electrical department, where the appliances are designed for practical work.

American Institute of Electrical Engineers.—At the annual meeting in Philadelphia recently the following officers were elected: President, Prof. Edwin J. Houston, Philadelphia; treasurer, George M. Phelps, New York, each for one year; vice-presidents (for two years), Prof. William A. Anthony, Vineland, N. J.; Francis B. Crocker and James Hamblet, New York; managers (for three years), A. E. Kennelly, Philadelphia; William D. Weaver, Charles S. Bradley and William B. Vansize, New York.

American Chemical Society, New York Section.—An innovation was introduced on May 11th, consisting in an informal dinner preceding the meeting. The experiment was so successful that it will be repeated. The dinner was entirely informal in its nature, and was held at the Hotel Hungaria. At the meeting which followed Prof. C. L. Speyers, of the Committee on Physical Chemistry, discussed the recent progress in that branch of chemistry, drawing particular attention to the work on solution thermodynamics and electro-chemistry. Prof. Morris Loeb, of the Committee on Inorganic Chemistry, reported on a number of interesting papers. Special notice was given of late work on the complex inorganic acids and the ammonio-cobalt basis. Prof. Peter T. Austen presided.

Engineers' Club of St. Louis.—At the regular meeting, May 16th, Eugene J. Spencer and E. O. Fredericks were elected to membership. Mr. T. L. Condon read a paper on "Punching as a Means of Testing Structural Steel," presenting the results of nearly 600 punching tests made at the Washington University testing laboratory. The effects of punching were illustrated by specimens, and by lantern slides showing photographed sections of plates. Mr. Condon had made earlier studies of this subject at Pittsburg and Terre Haute, and had been assisted in his investigations by Prof. J. B. Johnson and Messrs. Harrington and Norton, students of the university. The author was not prepared, however, to draw any definite or general conclusions from his investigations as yet, but promised a further report to the club. A paper by Mr. David Molitor on "The Distortion of a Framed Structure Graphically Treated," was read by title.

Montana Society of Civil Engineers.—At the regular monthly meeting in Helena, May 12th, Mr. Geo. Schuetz was appointed to furnish the society with a paper for the June meeting, and Mr. Walter S. Kelley for the July meeting. The society then proceeded to the discussion of the law regulating the appropriation of water. Mr. Foss read the Montana law and suggested improvements in line with the laws of Colorado and Wyoming, extracts from which were read. After further discussion, Mr. Keerl offered a resolution that a committee of five members be appointed to consider the subject of the appropriation and use of water, and to suggest such changes in the present law as they deemed advisable, with a view of advancing the interests of irrigation in Montana. The chair appointed as such committee Messrs. Keerl and Foss, of Helena; Harper, of Butte; Ryon, of Bozeman, and Schuetz, of Miles City. The secretary was instructed to correspond with the Butte members with a view of holding the July or August meeting of the society in that city.

Russian Society of Mining Engineers.—Our special correspondent writes that at the regular meeting in St. Petersburg, February 18th (March 2d) last, Mr. P. K. Yavorovski read a paper on the ore deposits of the Irbinsk mining district in the government of Yenisseisk in Siberia. This district is in the valley of the Irba River, beginning about 20 miles above the point where that river flows into the Tuba, a navigable tributary of the Yenisei. The iron ore deposits of the valley are very extensive, and the limited workings there have shown the ore to be of high quality. It contains from 64.5 to 67% of metallic iron, and is free from phosphorus. Iron works were established in this district in the 18th century, and several charcoal forges were in operation until 1828. At present the Abakanovsk Works are the only ones in operation in the Yenisseisk government, and are quite unable to meet the demand. Iron is brought from the Oural region, and now costs from \$60 to \$70 per ton. As the population of the region is growing rapidly and demand increasing, it is believed that the re-establishment of iron works at Irbinsk would be profitable. The present cost of making iron there is estimated at \$30 per ton, which may be reduced when the Siberian railroad is opened.

In the Irbinsk district there are also deposits of copper ore, which have been traced for some distance. The average of a number of assays from the outcroppings have given 4.17% of copper.

On the upper waters of the Irba gold placers have been worked to some extent. The amount of gold is small, but sufficient to pay for working.

Ontario District Mining Schools.—A circular from the Bureau of Mines at Toronto makes the following announcement: In the session of the Legislative Assembly just closed provision was made for the maintenance of summer mining schools in the principal mining districts of the province, to be organized and carried on in connection with the School of Practical Science, Toronto. The plan of such schools would embrace instruction on the following line of subjects: 1. Elementary Chemistry; 2. Blowpipe Assaying; 3. Descriptive Mineralogy and the Determination of Minerals; 4. Mining Geology; 5. Lithology.

It is intended that Dr. A. P. Coleman, professor of metallurgy and assaying in the School of Practical Science, shall have general direction of the work of the schools, with at least two assistants to give instruction to the classes in the foregoing subjects, which will be largely of a practical character. No charge will be made for instruction, but each student will be expected to furnish himself with a blowpipe set, without the aid of which he can hope to make little progress in the class. The instructors will have a supply of the sets for the students, to whom they will be sold at cost price, say about \$3. If a central place for holding the school could be secured easy of access to all who might desire to avail themselves of the course of instruction, it would doubtless be the most satisfactory arrangement, but as it is probable that the class or classes would be composed of persons engaged in actual mining at the mines and works, it may be necessary to form local classes where instruction could be given for a definite time from day to day, or for two or three days of each week, for the whole term of three months. In either case the teaching hours would be made to suit the convenience of the men before or after their regular working hours. The work of these schools will begin as soon after June 1st as arrangements can be completed. Circulars have been distributed as widely as possible in each district.

Anglo-American Club, Freiberg, Saxony.—This club has just issued the report of the Executive Committee for the winter semester 1893-94, which will be the first of a series of half-yearly reports. This report will be of great interest to all who have had any connection with the mining school at Freiberg, as besides containing a short history of the club since its foundation in 1866, under the name of the "American Colony," it gives a list of all Anglo-Americans who have been students at the academy since the founding in 1766. We are sorry to notice that an opposition club has lately been founded, but it is hoped that it will not be able to hurt the old organization. At present the latter has 20 active members, and the committee very rightly makes appeal to its old members in the following words:

"The most important reason, however, which led to the issuing of a report was the feeling, which has been growing for the past few years, that it would be greatly to our advantage if we could by any means persuade old members to take a more active interest in the club than has been the case up to the present time. It is only natural that old members after a few years cease to take the same interest in the club as at first, the members they knew personally having all left; but still they might, by becoming corresponding members and sending any pamphlets, etc., that they write, afford us great help. We freely acknowledge that we shall receive the most advantage from the arrangement, but, nevertheless, it is only right that the alumni should continue to take some interest in their alma mater, if only in remembrance of their student days. For the same reason a corresponding membership has been founded. Any old member may become a corresponding member on payment of a yearly fee of five marks to defray the cost of the printing and postage of these reports."

Besides the report of the secretary there are some very interesting personals in relation to old members. The officers for the summer semester, 1894, are as follows: President, Fred. C. Wehner; vice-president, G. A. Waller; secretary, J. E. H. W. Somers-Vine; treasurer, J. A. L. Henderson; librarian, B. F. Davis; geological curator, O. B. Schuette.

INDUSTRIAL NOTES.

The Gates Iron Works, Chicago, have sold a Tre-main steam stamp to go to Montana.

Newberry furnace at Newberry, Mich., has gone out of blast for the present. It is a charcoal furnace.

The People's Iron Works, Philadelphia, have just let the contract for the erection of a new machine shop 30 by 160 ft. in size.

Phillips' window-glass factory, at Pittsburg, Pa., was almost totally destroyed by fire on May 21st. The loss is estimated at \$75,000.

The Sharon Iron Works, Sharon, Pa., closed down last week, owing to inability to secure coke. About 800 men were thrown out of work.

The Wheeler Projectile Works, at Demmler, Pa., are being run full time on government work, and will continue so for at least a month.

The Robinson Rea Manufacturing Company has the contract to supply part of the machinery for the new plant of the Saltsburg (Pa.) Rolling Mill Company.

The Weber Gas and Gasoline Engine Company, Kansas City, Mo., reports an increasing business, with a number of orders recently for engines of various sizes.

The Union Iron and Steel Company, at Youngstown, O., has been obliged to close all its works except the bar and guide mills on account of inability to procure coal.

The Norton Iron Works, Ashland, Ky., have been forced to bank the fires because of inability to secure a coke supply, and will remain idle until the coal strike is settled.

Ella furnace at West Middlesex, Pa., blown by Pickands, Mather & Co., of Cleveland, will blow in as soon as repairs have been completed. It has been idle for about two years.

The Bethlehem Iron Company's rail mill at South Bethlehem, Pa., was compelled to close down on May 21st owing to the high water from the river backing in on the pumps.

The pipe plant of the West Superior Steel and Iron Company has been started up on a small scale by the receiver. It will be a long time before the Bessemer plant can operate.

The Superior Steel Company, Pittsburg, is now making nickel steel to take the place of crucible steel in the manufacture of all kinds of optical work and also watch springs, for which there is a good market.

For the first time in 12 years the mills of the Mahoning Valley Iron Company at Youngstown, O., are idle. The shutdown is occasioned by the fuel famine. The company has plenty of orders, but not a pound of coal.

The Adams Boiler Company, Cleveland, O., has shipped to the Witte Water Placer Company, Paramaribo, Dutch Guiana, an upright water tube boiler of 125 H. P., to be inclosed in sectional iron jacket, to run Worthington pumps at the gold placers.

The Pittsburg Bridge Company, Pittsburg, has been awarded a contract for a new erecting shop for the Pittsburg Locomotive and Car Works. This is the third large building which this company has furnished and about 300 tons of steel will be used in its construction.

The Burton Electric Forging Company, of Boston, will build a plant at Woburn, Mass.; the shop will be 180 by 60 ft., one story. A portion of the building is expected to be ready for the machinery about June 1st, and the structure will be completed for occupancy early in the summer.

The Minnesota Furnace Company, owning a coke blast furnace at Duluth, Minn., has sold all its stock of Bessemer pig iron to a leading Pittsburg steelmaker. The price is understood to have been about \$30,000 for something like 2,000 tons. The coal strike was the immediate cause of the sale.

The Totten & Hogg Iron and Steel Foundry Company, Pittsburg, has just closed a contract with the Irondale Steel and Iron Company for its new tin plate plant at Middleton, Ind., consisting of three 24-in. hot mills, all complete with rolls, etc., one squaring shear, two double shears and a lot of spare rolls.

The city of Youngstown, O., opened bids recently for 1,000 tons of cast iron water pipe. The bids were as follows: Addyston Pipe and Steel Company, \$16.65; Anniston Pipe and Foundry Company, Anniston, Ala., \$17.35; Chattanooga Foundry and Pipe Works, Chattanooga, \$18; National Foundry Company, Scottsdale, Pa., \$18.91; R. D. Wood & Co., Philadelphia, \$20.56. Last year the city paid \$21.75 for pipe.

The Bellaire Nail Works Company, at Bellaire, O., has begun the work of building an additional furnace, a new machine shop, casting-house, and four hot-blast stoves on the east side of the present steel works. The estimated cost of the improvements is about \$250,000. For the new plant McClure & Amsler, of Pittsburg, have the contract for erecting the furnace, which will be 18 by 75 ft., and the four Massick & Crookes stoves. S. Barnes & Co., of Rochester, Pa., will furnish the firebrick. The Crane Elevator Company has the contract for a 12 by 12 ft. furnace hoist.

Owing to the extraordinary rise of the Schuylkill River, the Glasgow Iron Company's works, north of Pottstown, Pa., and the Valley Mill are flooded and closed down. The Ellis & Lessig Steel and Iron Company, west of Pottstown, started the nail works on May 21st, but were compelled to stop in a couple of hours. The boiler works of Sotter Bros. are flooded and stopped. The furnace of the Warwick Iron Company has been banked up, because of 5 ft. of water in the stockhouse, so that the filling cannot be done. The fires have been put out in the Pottstown Iron Company's works, excepting the nail factory, which has been running as usual.

The affairs of the late concern of Pedrick & Ayer, machine tool builders of Philadelphia, have been satisfactorily adjusted by the receiver, Mr. Hibbs, and the plant and business have been turned over to the new company, a corporation known as the Pedrick & Ayer Company, of which Mr. Chas. A. Moore, of Manning, Maxwell & Moore, New York, is president; Mr. E. L. Maxwell, of the same concern, treasurer, and Mr. D. W. Pedrick, of the old concern, is secretary, assistant treasurer and superintendent and in charge of the business. The new company is capitalized for \$100,000, and comes into possession by purchase of the plant and business of the old concern.

Schoenberger & Co.'s Fifteenth Street mill, in Pittsburg, employing 1,000 men, shut down on May 21st in all departments, on account of the fuel famine. The embarrassment of the iron and steel producing interests by reason of the strike is now general. It is reliably stated that the only two concerns making steel billets in the Pittsburg district, at least in quantities worth considering, are Jones & Laughlin and the Carnegie Steel Company. The small mills are having great trouble to obtain billets. Those operating with gas for fuel are equally hampered, because the mills and furnaces operated with coal and coke cannot furnish the raw material. Owing to the strike the Pittsburg Wire Works, at Braddock, have closed, throwing 450 men out of work. Furnaces H, I and B of the Carnegie plant were banked May 15th, and were blown out May 19th. The lack of coal also closed the Duquesne Forge, at Rankin.

The Westinghouse Electric and Manufacturing Company's report for the year ending March 31st states that the directors are able to present a satisfactory statement. The net profits from manufacturing and other sources were \$1,640,809, after charging to operating expenses large sums for improvements to buildings, maintenance of machinery and all sums paid for interest and discount, excepting interest on bonds and script, which has been charged off direct to surplus. The accounts payable, bills payable issued for merchandise, etc., have been largely reduced from the profits. By the recent sale at par of the preferred stock in the treasury of the company, the bills payable have been further reduced since March 31st, so that on May 9th there were outstanding only \$560,982 of bills payable of all kinds, of which \$37,869 were issued for merchandise. The World's Fair lighting contract and exhibit yielded satisfactory results to the company, and all payments thereon are completed. The general balance sheet shows: Current liabilities: Accounts payable, \$311,750; bills payable, \$116,934; total, \$428,684. Cash offsets: Cash in banks, \$325,695; bills receivable, \$373,445; accounts receivable, \$2,345,161; total, \$3,044,301. Current liabilities, \$428,684; discounted with collateral, \$697,300; contingent liabilities, \$757,685; stock, \$9,016,596; surplus, \$3,822,049; total liabilities, \$14,722,314. Current assets, \$3,044,301; material on hand, \$1,545,472; advanced to leased companies, \$109,125; bonds and stocks, \$4,228,389; real estate and machinery, \$1,350,855; miscellaneous, \$66,339; charters and patents, \$4,379,332; total assets, \$14,722,314.

Press dispatches from Pittsburg, Pa., give the following as being in substance the scale that has been adopted by the Amalgamated Association of Iron and Steel Workers in session at Cleveland, O.: Iron mills working steel, except sheet mills, shall pay price and half price for steel, but this rule shall not apply to mills that are working steel whose output is proportionately as great as that of iron. The price of puddling is fixed at \$4 per ton. On this price the rest of the scale is based. It is the price prevailing at present in union mills. The company is to furnish a heater on all mills working iron and steel of 160 lbs. or over. The time in scrapping, busheling and finishing departments is not to exceed in any case 9¼ hours. This does not apply to puddling furnaces working on the three-turn system or to mills working shorter changing hours. Wherever deviations from the Western iron scale signed for by any manufacturer and the Amalgamated Association are made and evidence is produced to prove it, the Amalgamated Association and manufacturer agree to make every effort to correct the same provided the furnaces are similar, but if the deviations continue to be tolerated by the Amalgamated Association all other mills shall receive the same. To insure uniformity of iron in boiling furnaces and to avoid the increasing custom of running in strong for common iron, thus increasing the hours and work of the boiler, the limit of time for each heat shall be: Single furnace, 1 hour and 45 minutes; double furnace, 1 hour and 50 minutes; Siemens' furnace, 1 hour and 55 minutes; double double furnace, 2 hours. On bar and rail plate mills the price for rolling and heating is fixed at 56.7c per ton when bar iron is at 1½c. One inch rounds to be paid for at guide mill prices when worked by hand on a bar mill. Catching on a bar mill shall be paid at the rate of ½% of the price of bar mill rolling. Nail plate heating is to be the same as bar mill heating. Heaters on 12-in. mill to receive bar mill prices. One man's help shall be furnished by the firm on all bar mills working bar or skelp iron. The guide, hoop, cotton tie and 10-in. mill scales remain the same as at present, as do the plate and tank mill scales. In structural mills the limit has been raised to a 22-in. instead of a 20-in. mill.

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 convention of the Western Federation of Miners' Unions was held in Salt Lake City, Utah, last week. Resolutions recommending the free and unlimited coinage of silver and sustaining the action of the miners' strike in the Cœur d'Alene and Cripple Creek were passed.

Bankers' Mining and Milling Company.—This company has been organized, with its main office in Newark, N. J. The object is to carry on the business of mining and milling ores in Colorado, California and other States. The capital is placed at \$250,000. The incorporators are: Jacob Gray and John Gath, of New York; Sylvanus Ayres, Jr., of Bound Brook, N. J.; George Schule, of Brooklyn; Jacob Harmon, of New Rochelle, N. Y.; Charles and William C. Boschen, of Brooklyn, N. Y.

ALASKA.

Alaska-Mexican Gold Mining Company.—This company reports the clean-up for the month of April as follows: Period since last return, 30 days; bullion shipped, \$13,970; ore milled, 5,321 tons; sulphurets treated, 112 tons; of bullion there came from sulphurets, \$3,252. The working expenses for the month were \$13,535.

Salmon River Placers.—A company, composed of H. W. Allison, of San Francisco, and others, is now preparing to ship a large hydraulic plant which is to be used in working the bluffs on the Salmon River, a tributary of the Yukon. Members of the party have worked on this stream for two seasons past, and believe that the bluffs can be profitably worked on a large scale.

ARIZONA.

Yavapai County.

Henrietta Mining Company.—The financial troubles of this company remain unsettled, says the Prescott "Journal-Miner." They are said to have been caused through an agreement to apply 50% of all the bullion taken out on the payment of the mine. The employees of the mine are said to be in possession of the last clean up of bullion, amounting to \$2,000 or less, which they are holding until they receive their pay.

Windfall.—It is reported that a high grade of free-milling gold ore has been struck at this property, and that the vein has widened out to 2 ft.

As developed so far the Windfall has a tunnel 100 ft. long which strikes the ledge 65 ft. from the surface. The owners have over 50 tons of ore on the dump, and will probably make a shipment soon. This property is located in Lynx Creek, about 2½ miles north of the Howell smelter.

Yuma County.

Harqua Hala Gold Mining Company, Limited.—The following is the estimated return for the month of April: Crushed during the month, 2,600 tons; estimated gross value of gold produced, \$32,000; miscellaneous revenue, \$500; total revenue, \$32,500. The estimated total expenses were \$12,100, leaving the estimated profits for the month \$20,400.

CALIFORNIA.

Amador County.

Wildman.—The 20 stamps of the mill are crushing steadily on ore from the new strike, but as only a short run has yet been made it is impossible to determine what it will pay. On the 1,200-ft. level there are 40 ft. yet to run before the drift will reach the same distance as now being worked below. It is expected that when the development is made on the 1,200 ft. level the entire 30 stamps will be worked.

Butte County.

Kelly Hill Mine.—Articles of incorporation of the Kelly Hill mine have been filed. The corporation will carry on hydraulic mining and will purchase and lease mining lands, water rights, etc., in Butte County. The Kelly Hill mine was the first one to apply for and receive a permit from the Debris Commissioners to carry on hydraulic mining under the Caminetti Act, says the Oroville "Mercury." The promoters erected extensive impounding works, which were inspected and approved by the commission, and hydraulicking has now been going on for some months. The debris has been restrained with success.

Calaveras County.

The mining outlook is bright at Murphy's, says the Calaveras "Prospect." The Stanislaus River claims bid fair to rival all the other districts. In the east shaft of the Mayflower quartz of a richer character than hitherto extracted has been struck, and the lode is increasing in width. Quartz from the Cunliff and Driver property is being hauled to the Beatrice mill, five stamps being constantly run on this quartz.

Lemaru.—It is said a 50-stamp mill will be put up at the Lemaru mine at San Andreas.

McFall.—This mine at Angels has reached a depth of 80 ft. The shaft is run in solid quartz, with a large percentage of sulphurets.

Mono County.

Bodie Consolidated Mining Company.—The latest weekly official letter says: The north drift from No. 1 west crosscut 300 ft. level was extended 5 ft.; the ledge in bottom of drift is about 5 ft. wide and at a point about 5 ft. from bottom of drift the east wall got very flat, making the ledge on top of drift between 8 and 9 ft. wide; the ledge, where it is so wide, is more broken up. Started an upraise from above drift and extended it 4 ft.; the ore in both places is good grade. We are stopping out ore from above south from Burgess winze, 200 ft. level. We have been repairing the Bodie mill and will commence crushing ore as soon as we receive some machinery from Virginia City belonging to the mill engine which is now on the road.

Nevada County.

Maryland Mining Company.—The annual meeting of the stockholders of this company was held in Grass Valley last week. The following board of directors was elected for the ensuing year: S. P. Dorsey, Geo. D. McLean, L. V. Dorsey, T. C. Dorsey and C. H. Smitten. The board then elected S. P. Dorsey president and superintendent, and Louis V. Dorsey secretary and treasurer.

(From our Special Correspondent.)

Consolidated Wyoming Mining Company.—The trial of the suit entered by this company against the Champion Mining Company, of Deer Creek, commenced last week in the United States Circuit Court at San Francisco. The plaintiff has claimed that defendant has sunk upon its veins in the clip, and has extracted ore therefrom for a number of years, to the amount of nearly 50,000 tons, of the value of \$10 per ton net. The suit has been instituted to enjoin the Champion company from further working the lode claimed by plaintiff, and to recover the amount claimed as value of ore already extracted. On the other hand the Champion company proposes showing that because of the plaintiff's claims it has no extra lateral rights, and that the defendant was, therefore, entitled to work the ore under its own surface.

Placer County.

Mayflower Gravel Mining Company.—A bullion shipment valued at \$1,900 has been made by this company.

COLORADO.

Gunnison County.

Dubois District.—L. W. Teatum of Denver has secured a bond and lease on the Eureka lode in Goose Creek, at Dubois, for one year, at \$8,000. He is also to pay 15% royalty. Manchester & Davis have secured bond and lease on the Smeede, Baltimore and Little Don lodes, for one year, and will at once put on a full force of men, as work must be continuous.

Lake County.

According to our exchanges the Union Leasing Company is carrying on an important piece of work on Fryer Hill, and with over 150 men employed is opening up a large section of rich ground. The Olive Branch, Jennie Lee, Forepaugh, El Paso, Bangkok-Cora Belle and others in that neighborhood belong to the lease. The drift between the El Paso and Olive Branch has been completed. On the Jennie Lee a new shaft is being sunk to catch the ore chute. Work of opening up the Bangkok through the old shaft has been commenced. The company is working on a large scale and is meeting with success.

Olga lessees are doing vigorous development work on the Olga from the 270-ft. level, where a drift is being run. An upraise is also being made with the hopes of catching the Maid and Henrietta ore chute.

Big Evans Mining Company.—Deeds have been filed in this company to J. A. Vickers, conveying all interest in the Charleston and Famous mines; consideration, \$15,000.

J. H. Stotesbury vs. State National Bank.—J. H. Stotesbury has brought suit against the State National Bank and the Hendrie & Bolthoff Manufacturing Company. The complaint alleges that in December, 1889, the Agassiz Mining Company made a general assignment of all its property for the benefit of all its creditors to Charles L. Hill, assignee. It seems that at the time of the assignment the State National Bank held as collateral 163,750 shares of the stock for a debt of Stotesbury's, who was also one of the members of this mining company. The plaintiff now asks that the accounts which were transferred to the defendants be re-assigned to him, and that an accounting may be had of the property, capital stock and profits of the Wolfstone property; that the defendants may be adjudged and decreed to pay over to plaintiff the capital stock, proceeds and profits derived by them from the Wolfstone company on account of the Wolfstone and Agassiz mines.

Lucky Joe Mining and Milling Company.—Deeds have been filed from this company conveying all improvements and the Little Joe lode, excepting a certain portion, consisting of 10 acres; consideration, \$250,000.

Resurrection Gold Mining Company.—This company has filed articles of incorporation. The incorporators are D. H. Moffat, Eben Smith, C. J. Hughes, Jr., and the capital stock is \$5,000,000. They will operate in Lake County.

Stray Horse Gulch Mining Company.—A meeting of this company will be held May 26 to consider an important project. The company owns the Rarus, a patented claim on Brece Hill. In former days considerable work was done there, and two shafts have been sunk. No prospecting for gold was ever done, and it is believed that by sinking down still farther gold ore bodies will be encountered.

Welden.—While the management of this property are not shipping any ore at present, owing to the low price of silver, they will go after the Orion ore chute, and as this trends toward the south they have decided upon sinking a new shaft some distance west of their present one. It will be located between the Penrose and Bohn properties, and a contract for sinking 550 ft. has been made. They will go even lower if necessary.

(From our Special Correspondent.)

Bonair Mining Company.—This is one of the big companies recently organized, and, with Eben Smith, D. H. Moffat and other prominent mining men at its head, expects to begin operations this week on the old Star of Hope property. They will drain the shaft. One of the principal drifts runs almost entirely in lime, excepting where upraises have been made, and large bodies of iron are opened up.

Commercial Mining Company.—Regular shipments are being made from the Capital shaft of high grade iron flux. This iron is filled with small seams and streaks of lead. A new drift started in virgin ground follows the contact, and has opened up a new body of ore indicating the extension of the Wolcott ore chute still farther north.

Grey Eagle Consolidated.—Shipments are regular through the Penrose shaft; 40 tons of sulphide and 125 tons of iron daily. Considerable development work is being done. Three new drifts have recently been started in virgin territory, and two of these have already opened up ore in paying quantities.

Hulda Mining Company.—The new shaft on the Garbutt is in white porphyry at a depth of 350 ft. The shaft went down through a badly broken up formation in which streaks of ore, brown shale, gray porphyry and quartzite were found. Some surface water is coming in, and, if necessary, an additional pumping plant will be placed.

Marian.—Shipments have been increased to 80 tons a day. A large new hoister is being placed in position and a double cage will be purchased.

Rock Hill Mines.—No new work is being done. A few lessees have small bodies of ore in the La Plata. Some shipments are also being made from the Vivian and Weir leases on the Nisi Prius. Small shipments also from the Rock, Dome and Stone.

Small Hopes.—Seventy-five tons a day is the output. The ore is a good sulphide, and comes from the Emmet shaft.

La Plata County.

Baker's Contact.—This ore body is now proved to be one part of a horizontal ore zone cutting through the whole mountain group. Colonel Baker, the owner, says that a mill would soon be ready.

Black Gold.—On this property located on the South Fork of Lightner Creek a 5-ft. vein has been disclosed. The first assay gave 289 oz. silver and \$5 in gold per ton. The vein matter is unlike anything seen before in La Plata, and carries, besides silver and gold, some copper. According to latest information this prospect is sold to some Denver parties; consideration \$8,000.

Columbus.—This property is to be developed by a crosscut tunnel during the summer.

Comstock.—After an idleness of some years this property is to be worked again under 13 years' lease to Messrs. Shaw et al., of New York. While repairing the old shaft the lessee broke into a body of rich ore, which for some reason had been lost. The lessees have already made preparations for building a mill in which they intend to treat the old dump containing several thousand tons, until the mine can be put in order for the extraction of ore.

Little Kate.—On this property a crosscut tunnel has been driven, and operations are now to begin on larger scale. The owners, Allen Mining Company, of Pueblo, have also leased the old Lewis mill, where, as reported, the cyanide process will be used.

Park County.

Alma District.—The mining season has opened earlier than usual in this district. The Orphan Boy and Paris are shipping regularly, while lessees on a number of other properties ship an occasional carload of good gold ore. Placer mining is now under full headway at Alma, Fairplay, Beaver Creek and Tarryall. At Alma day and night shifts are on, new flumes and ditches have been constructed. The dirt being washed at the new workings is the richest yet encountered. The Green Mountain Company owns this placer. The Lee Goss, First National and Montgomery mines, belonging to the same company, which have many thousands of tons of gold and copper ores in sight, are expected to be put in active operation this season.

Ella C.—This property at Balfour has been leased and bonded to a party of Colorado Springs capitalists. It is said that three shifts will be worked steadily, and a carload shipment of the best ore in the property will be made.

Pitkin County.

Mollie Gibson Consolidated Mining and Milling Company.—With reference to the latest strike in the Mollie Gibson the president of the company, Mr. J. J. Hagerman, is reported to have made the following statement to the local papers: "About all the development work that has been done since the mine was freed from water several months ago has been north of the shaft and in the direction of the Smuggler in the 8th, 9th and 10th levels. A very large body of moderate grade ore has been uncovered, averaging 30 to 60 oz. in silver, from 5 to 6% of lead, and with streaks of richer ore running up as high as 200 oz. In one place there is what seems to be a good body of richer ore, but sufficient development has not yet been done to say whether it is large or not. The old rich ore chute which yielded so much profit should be found several hundred feet south of the shaft and south of any work which has yet been done on the lower levels. The reason work is not prosecuted to the south rapidly is because of the fear of encountering too much water, which is stored up in the Argentinum Juniata mine, several hundred feet to the south. As soon as the Argentinum Juniata is pumped out, work to the south in the Gibson will be vigorously prosecuted. The mine has produced about enough ore to pay all expenses during the past few months.

Saguache County.

Creede Mining Suits.—In the United States Court at Denver, last week, the suits of A. J. Shear vs. The Great Republic Mining and Milling Company, Mary Taylor vs. The Happy Thought Mining Company, and Ironclad No. 2 vs. Happy Thought were all dismissed by stipulation. The Court gave judgment for the plaintiff for possession of the Mary Taylor lode and for defendant for that portion of the Mary Taylor conflicting with the Happy Thought. The properties are at Creede.

Kreutzer Sonata.—This property is again sacking ore, and expects to make a shipment this month. The new tunnel has drained the shaft so as to permit sinking on the ore body to be resumed.

Nelson.—The tunnel has reached a length of 1,450 ft. Frequent feeders and pockets of mineral are being encountered, and the prospect is good for an early contact with the lead. The breast in the drift on the lead cut by the Schuykill cross-cut is improving. A 6-in. streak of solid galena has come into 1½ ft. of talc sliced with mineral stringers. The tunnel is going ahead at a good rate.

San Miguel County.

Smuggler-Union Mining Company.—This company's mill at Pandora is crushing 110 tons of ore from the Union dump daily. One car of rich concentrates is the daily output.

Taylor.—This mill is putting through a 200 ton lot of gold ore from the Warner group for E. E. Heckley, and the San Miguel Consolidated Huntington mill, on Bear Creek, has been thoroughly overhauled and put in shape to treat ore from the same property. The group will be thoroughly tested by mill

runs from the different claims comprising it under the supervision of Fred Wilken representing the Denver sampling works. The K. C. Humboldt, leased by George L. Fisher, after a year's idleness, has started up with a small force of 15 or 20 men. If the returns from a few cars of ore are satisfactory both working force and shipments will be augmented.

IDAHO.

Alturas County.

Big Annie.—This company is preparing to put up a mill on its property near Hailey, with a capacity of 50 tons a day.

Bear Lake County.

Blackstone.—Messrs. J. R. Clawson and William H. Dodge, of Park City, are developing this mine near St. Charles quite rapidly. Since last November they have extended a drift tunnel 300 ft., and it is now in 340 ft. The vein lies at a dip of 18° and between blue limestone above and dolomite lime at the foot. This bedded vein is 4 ft. thick and carries galena ore all through, so it is expected to concentrate three to four tons into ore, making a product which will average 75% lead, 3 or 4 oz. silver and carry enough iron and lime to make it a most desirable fluxing ore. The face of the tunnel is about 150 ft. beneath the surface, but as it is extended the depth will increase 1 ft. to 1½ ft. The owners have started a tunnel 200 ft. lower, which is intended to crosscut three other veins lying above this one, all of which are good. It will take about 1,000 ft. of cutting for this tunnel to intersect all these four veins. They now have about 700 tons of ore on the dump, and large amounts ready for stoping. A ditch one mile long already constructed will, with a fall of 65 ft., give about 60 H. P., which is to be brought into use in operating a mill for which the lumber is already on the ground, and the machinery will soon be shipped in. It is proposed to have a mill capable of handling 100 tons of crude ore per 24 hours ready for operating by September.

Bingham County.

A number of placer locations have been made on Camp and Wilson creeks at the base of the hills north of Camas Prairie. Work for the season has begun, and a number of men are engaged in digging a ditch to carry water from Camp Creek.

Owyhee County.

Cumberland.—The owners, Shaw Brothers, have not been idle this winter. The main tunnel has been extended south and now has a length of some 300 ft., with about 150 ft. of backs at the face. A fine lot of ore has been exposed in this drift and stripped. The pay is from 10 to 15 in. in width. This ore shoot has been opened for a length of 83 ft. and a depth of 50 ft. and is continuous. The gold in the face is much coarser than formerly.

De Lamar Mining Company, Limited.—The following is the return for the month of April: Crushed during the month, 3,455 tons; bullion produced in mill, \$70,720; estimated value of ore shipped to smelters, \$7,875; miscellaneous revenue, \$870; total revenue, \$79,465. The total expenses were \$37,216, leaving the profit for the month \$42,249.

Legal Tender Mining Company.—This company has bought a mill from the Fulton Iron Works, San Francisco, says the "Idaho Avalanche." It is a five-stamp mill, the stamps weighing about 900 lbs. each. Although but five stamps will be put in at first, there will be power for 10 stamps, and the mill will be fitted for that number. Frue vanner concentrators will be used. The mill is to be erected at Crossman Springs, 3½ miles from the mines. The haul from the mines to the mill will be all the way down hill, however. The mill building will be 28 x 75 ft., and will be built of Arizona lumber. Besides this, there will be erected an engine-room, 20 x 30 ft.; an office, 12 x 24 ft.; and an assay-room, 12 x 14 ft., and a dwelling-house.

Louisiana.—This property is located a short distance east of the Cumberland, on the eastern slope of War Eagle Mountain, says the "Idaho Avalanche." It has been opened a distance of about 200 ft. by tunnel, which shows a strong and continuous ledge. The pay streak is over 2 ft. wide in the face. The ore is low grade, and the bullion is worth from \$6.50 to \$7 per oz. A car and track will soon be placed in the tunnel and the drift continued south.

Trade Dollar.—The face of the adit tunnel still continues in good ore, fully 2 ft. wide. Progress has been somewhat slow on account of loose ground, requiring close timbering. A water-shaft will soon be put in from the No. 3 tunnel to the face of the adit drift, a perpendicular fall of some 400 ft. About 60 men are employed at the mine and mill. The mill is running steadily.

Shoshone County.

Bunker Hill & Sullivan Mining Company.—Advices received at Spokane from the Coeur d'Alene indicate that the miners have reconsidered their decision to strike for higher wages, and that work is proceeding as usual in these mines.

Coeur d'Alene Silver-Lead Mining Company.—The trustees have issued a circular announcing that the assessment of 6c. per share ordered recently has been rescinded by vote of the trustees. The circular adds: Concerning the above we would explain that the mine has not been operated since early in December, 1893, having closed to allow making needed improvements, during which time the shaft was enlarged and retimbered, and additional machinery bought and placed in position, causing an

indebtedness of over \$50,000. On account of the severe snowslides in the canyon we were forced to lay idle for over a month after these improvements were completed. The mine is now working and is in a promising condition, and our bankers have kindly consented to carry our indebtedness, thus making possible the passage of the foregoing resolution. Regular shipments are now being made and we hope, on account of our increased facilities, to soon wipe out the indebtedness, and place the mine as of old on a dividend paying basis.

Tiger.—This mine, says the Wallace "Miner," shipped 550 tons of ore, working on one shift only. This included about 100 tons of crude ore which was sorted out without concentration. The Tiger ore continues of good grade, ranging from 60 to 70% lead and from 28 to 34 oz. of silver per ton, and it is a noticeable feature that it contains a smaller proportion of zinc than formerly. The work of development is continuing as usual. There are 50 men working in the mine and six in the mill, the total number being about 60.

INDIANA. Wells County.

Buffalo & Indiana Oil Company.—This company has been organized to bore for oil in this county. The directors are: William S. Grattan, Alva M. Jennings, Francis G. Ward, Theodore V. Fowler, Tracy C. Becker and William H. Orcutt. The main office will be in Buffalo, N. Y., where all the directors reside.

KENTUCKY.

Proctor Coal Company.—The stockholders held their annual meeting in Louisville, Ky., recently. The following directors were elected: W. E. Grinstead, W. N. Culp, H. F. Finley, S. S. Eastwood, Charles Warren, Charles R. Kelley and Henry Terstegge. The officers were chosen as follows: W. E. Grinstead, president; Henry Terstegge, vice-president; H. C. Grinstead, secretary and treasurer.

MICHIGAN. Copper.

Atlantic Mining Company.—At the new mill-site, a short distance north of the Salmon Trout River, on the shore of Lake Superior, says the "Portage Lake Mining Gazette," the storage rock-bins are now completed, and the work of excavating for the mill foundation and also for the stamp heads has been resumed. The foundation of the mill will be about 20 ft. above lake level, the size of the building being 170 x 235 ft., to contain six head of stamps, with the necessary washing machinery. The lower bins, from which the stamps are directly fed, will be situated just in the rear of the stamps and above the mortars, being fed from the storage bins by means of cars traveling over a gravity road. The stamp head mortars will rest on solid foundations. The boiler-house will stand 60 ft. from the mill and on the west side, and is designed to contain seven Evans improved firebox boilers of 140 H. P. each, which are now being built by James Burt. The machinery will probably be operated by a 75-H. P. high-speed engine, the contract for which is not yet let. The water for the mill will be supplied from the Salmon Trout River, and will enter the mill by gravity, without the necessity of pumping, and it is anticipated that during wet seasons the surplus water will be utilized for power purposes. The water for milling purposes will enter the mill through a launder about 2,000 ft. in length, directly from the dam, which is some 50 ft. high and now in course of construction, the timber work being about completed; the filling of the cribs will be started as soon as the water lowers sufficiently to permit it. The dam is 200 ft. long, 50 ft. thick at the bottom and 25 ft. at the top, and built very strongly; the inner face is perpendicular and double planked. There are two 24-in. cast-iron waste pipes at the base of the dam, controlled by gate valves. The overflow is 30 ft. wide in the center of the dam and double planked. Four log houses have already been built, and during the coming summer three or four more will be erected, as well as a couple of frame houses. The work of clearing up the location is now going on. Adjacent to the mill site there has been exposed an excellent bed of sandstone, which is now being quarried to be used in the construction of the mill foundation.

Centennial Mining Company.—President Hinsdale has issued a circular to stockholders reviewing the condition of the company. On June 1st there will be due \$7,000 interest on the bonds outstanding; and unless this interest is paid at that time it is in the power of the bondholders to demand payment of the entire principal sum. Since January 1st the Osceola lode has been explored for a distance of 400 ft., but developments have been a continual disappointment. The company appeals to the stockholders to subscribe for bonds of the company, or in some other way to furnish money sufficient to pay the liabilities due June 1st; otherwise work will cease. There are outstanding \$85,000 of the \$300,000 authorized, and the company has borrowed besides \$14,000 with its bonds as collateral.

Cleveland Mining and Development Company.—Preparations have been made for resuming work on this company's property at Porcupine Mountain shortly. A steam hoist and pumping plant are to be put in for sinking at least two shafts.

Iron—Menominee Range.

Florence Iron River Company.—This company has surrendered its lease on the Youngstown mine at Crystal Falls. The machinery is now being taken

out. The reason is that the fee owners refuse to reduce the royalty, and as the ore is not of particularly good quality mining is unprofitable at present prices.

Penn Iron Mining Company.—This company, says the Norway "Current," is shipping from its mine and stock about 10,000 tons of ore per week. The working force has been gradually reduced until to 375 men are employed. At the East Vulcan shaft of the company work has been closed. The mine was left in good condition but is now rapidly filling with water, and no more work will be done on it at present.

MINNESOTA. Duluth.

(From our Special Correspondent.)

Ore shipments from the iron mines through this port have been 255,000 tons for the season to May 17th. A year ago not one ton had been shipped prior to May 13th. Of this season's shipments 117,000 tons are from the Vermilion range, and 157,000 by the Minnesota Iron Company. The average weight of the 25 cargoes loaded at the Minnesota company's docks last week was 2,136 gross or about 2,400 net tons, a very high average.

Iron—Mesaba Range.

(From our Special Correspondent.)

Auburn.—This mine, belonging to the Minnesota Iron Company, will begin shipping early in June. The Norman, belonging to the same company, will not be in position to ship before August.

Biwabik.—Thirty days will be required to get this property in shape for shipping. It is expected to get out 300,000 tons during the season.

Canton.—This mine is shipping an average of 3,000 tons daily. Its output to date has been 45,000 tons.

Duluth.—This company, operating a 40-acre tract of the original Biwabik, has given up its lease to the Lake Superior Consolidated, and some operations will be carried on later.

Ohio.—Drake, Stratton & Co. will strip this mine and shipping will begin in a month or two. Tod, Stambaugh & Co. will be agents of the mine.

Oliver.—This mine will soon be shipping 3,000 tons daily. It has already nearly reached that output.

Roucheleau.—Drill explorations prove the ore body on this property to be 1,600 ft. long. An average surface of about 110 ft. covers the ore.

Iron—Vermilion Range.

(From our Special Correspondent.)

Chandler.—A new incline shaft has been sunk and the arrangements of loading and shipping tracks changed.

Minnesota.—A steam shovel has been put at work loading the stock piles into cars. It will fill 100 cars daily and increase shipments largely.

St. Louis County.

(From our Special Correspondent.)

Reports of gold finds in the Rainy Lake region begin once more and local assayers have been busy since the opening of the transformation routes.

MONTANA.

Deer Lodge County.

Bi-Metallic Mining Company.—This company is remodeling its plant at Phillipsburg for the purpose of working over the tailings from its mill and also those of the Granite Company, of which a very large amount has accumulated. The plant will have a capacity to treat about 300 tons per day by the Russell process. Work on these improvements has been in progress for some time, and the company hopes to have the new plant complete in July or August. Should the results come up to expectation, it is said that later a plant for refining the bullion, similar to the Marsac Refinery at Park City, Utah, will be put in.

Elk Creek Mining District.—A number of men are going to work this season on the placers in Bear Gulch, the richest of which were worked some 20 years ago. It is stated now, however, that there is plenty of ground left in the gulch which will pay fair wages. Besides the individual miners, the Bear Gulch Hydraulic Mining Company has taken up a large tract of land in Bear and Deep gulches, through which a bed-rock flume is being constructed. There is an abundant supply of water with sufficient fall for hydraulic working. A considerable part of the flume was finished last season, and the company will soon be ready to start up for the present year.

Montana Mining Company, Limited.—The total output for April was: Gold, 2,510 oz.; silver, 24,010 oz.; the estimated realizable value of the same was \$64,100. The ore milled during the month was 5,347 tons, 100 stamps having been in operation. The expenditure was as follows: Working expenses on revenue account, \$30,700; outlay on developments, \$13,300; extraneous expenses, including insurance, \$2,350; permanent improvements account, \$100; total, \$46,950; leaving a balance of \$17,150 for the month.

Royal Mining Company.—At the annual meeting at Deer Lodge recently, the following officers were elected: President, Nelson Bennett; vice-president and general manager, Willard Bennett; secretary and treasurer, Lew Coleman. The company is now running three drifts, all of which are in ore, and are now starting a fourth one on a second vein

of ore which is 200 ft. under what is known as the middle tunnel. There is the same body of ore now that was found at the surface, although it is 400 ft. from the surface. There is a distance of 150 ft. between levels for stoping. The ore is one continuous drift from the surface for the distance (700 ft.) that has been tested and is still in the face of the drift, which is 400 ft. from the surface. The company has ordered new air compressors with which it will do all the prospecting work in the future.

Jefferson County.

Basin & Montana Mining Company.—This company some time ago struck a 3-ft. vein at a depth of 50 ft. in a shaft sunk on the east end of its Adelaide claim. The company then started to run a tunnel in on the west end of the claim, and last week struck an 18 in. vein of ore of the same character as that found in the shaft.

Elkhorn Mining Company, Limited.—The following is the return for the month of April: Mill worked 28 days and crushed 1,112 tons. Bullion produced in the mill, \$23,266; 180 tons of smelting ore sold, \$14,094; total produce, \$37,360. The total expenses were \$22,060; leaving the estimated profit for the month \$15,300.

Hope Extension Mining Company.—This recently organized company has begun work on its properties at Basin. It has purchased the Cedarwall and Moonlight lode claims, lying southwest and adjoining the Hope, Darwin and Apache Chief claims. The company is capitalized for \$400,000, with Dr. A. H. Mitchell, of Deer Lodge, as president; Lucian Eaves, of Portland, Ore., vice-president; Walter Mackay, treasurer; E. A. Nichols, secretary; C. E. Gable, manager, and George H. Tong. The company proposes to push the development work on these properties as rapidly as possible.

Madison County.

Leiter Group.—This group of mines, seven miles from Sheridan, in the Ruby Valley, has, says the Anaconda "Standard," given employment this winter to about 100 miners, mechanics and laborers. The principal mines are the Champion, Damsel, Grey Eagle and Sheridan. These have been worked from a tunnel at an average depth of nearly 300 ft. on the mine, from which a 100-ft. shaft has just been sunk on the Grey Eagle. At this depth a crosscut was run to the Sheridan mine, which was reached in 45 ft. last Wednesday, disclosing a body of ore as rich as any yet taken out of the mine, the extent of which has not yet been developed. At the bottom of the shaft in the Grey Eagle there is a 6-ft. vein of rich gold ore. The work of sinking has been resumed, and it is the intention, at present, to carry it down 1,000 ft. A fine hoist is erected in the tunnel, at the top of the shaft, and it is the intention to work both the Grey Eagle and the Sheridan from this point.

Missoula County.

Butte & Missoula Mining Company.—Preparations are now being made for an active season's work on the quartz claims near Stony Creek, which carry gold, and a representative of the company will leave Butte in a short time to perfect arrangements for the erection of a mill.

Silver Bow County.

Anaconda Mining Company.—Half a dozen persons, says the Butte "Miner," are now engaged in saving the copper from the water from the Anaconda mines. Three or four new tanks have recently been rigged up on the Idouna claim through which the water passes on its way to the creek. Mr. Ledford, who has the contract from the Anaconda company, it is said, will make an effort to prevent them working the water after it leaves his tanks. It is said his reason for this is that, on account of the demand for scrap iron, it has gone up in price and old tomato cans and the like which are used in the process are held at fancy prices.

Homestake.—According to the Butte "Inter-Mountain," W. R. Kenyon, William McDermott and R. B. Turner have secured a lease and bond on this gold property near Homestake station. This property is owned by C. W. Chapin and has been worked during the past year by Taylor & Co. Much of the ore has been shipped to the Butte smelters for treatment. The gentlemen who have recently acquired the property have also made a deal for the Kitty O'Brien mill in the same district, and will work not only the free milling ore of the Homestake, but that of other leasers in the vicinity. Five additional stamps will be added to the five now at the mill and other improvements are contemplated.

The Copper Mines.—Among the copper companies, says the Butte "Inter-Mountain," there is the usual activity. The Anaconda company is still raising a large quantity of ore. Every one of the company's 500 cars is constantly on the move, and four trains of 35 cars each are hauled away every 24 hours. The great ore bin at the Anaconda mine, capable of loading a train of 60 cars, is always kept filled up. The Whale is the chief producer.

The Boston & Montana Company is operating in full blast again, and has increased its output from 600 to 900 tons per day. The Butte & Boston company is also in full operation again. The Parrot company continues to work its usual force both at the mine and smelter. The Heinz works are producing regularly about 1,000,000 lbs. of copper every month. The Butte Reduction Works are being worked with vigor and are receiving a great deal of ore from the Ramsdell-Parrot, be-

sides from several of the Clark properties. At the Colorado the furnaces are being rapidly put into condition for smelting. Among the leased mines a better feeling prevails and a great deal of ore is being produced. The lease of the Clipper mine in Camp Creek district gives promise of some lively work in that neighborhood this summer. The Czarina strike reported last week continues to hold its own, the showing in gold being especially gratifying. At the Eveline the ground above the present lowest workings has been worked out west of the shaft. At present the ground east of the shaft which takes in over 500 ft. is being exploited. This ground has never been touched before. Drifting is now in progress and strings of good ore have already been encountered. The Jenny Dell mine is being worked through the Eveline shaft, the hoisting being done at night. A pocket of some good ore was found in the Jenny Dell. The reported rich strike was premature.

NEVADA.

Storey County—Comstock Lode.

East Sierra Nevada Mining Company.—At the annual meeting of this company held in San Francisco last week, 57,821 shares were represented, and the following officers elected to serve for the ensuing year: H. F. Cutter, president; W. R. Sherwood, vice-president, and E. F. Graves, C. C. Harvey and F. G. J. Margilson, directors; George R. Spinney, secretary, and R. P. Keating, superintendent.

Scorpion Mining Company.—At the annual meeting of this company held in San Francisco last week, 67,561 shares were represented, and the following officers elected to serve for the ensuing year: W. R. Sherwood, president; H. F. Cutter, vice-president, and H. Zedig, Wm. Bannan and Charles H. Ford, directors. George R. Spinney was re-elected secretary, and R. P. Keating superintendent.

Following are extracts from the latest weekly letters from the superintendents of Comstock mines: Justice.—The south drift from the bottom of the winze from the Blaine tunnel has been extended 15 ft. At this point the drift connected with an upraise from the main shaft. The fair-grade ore mentioned in last report continues, and there is a larger quantity of this ore in sight than at any time since the drift was started. Have shipped during the week to the Taylor mill about 100 tons of ore which is now being worked.

Alta.—The south raise has been extended 9 ft. in a streak of fair grade ore 1 ft. wide; average assays, as per car sample, \$21.80.

Belcher.—On the 850 level we have cleaned out and retimbered 50 ft. of the main north drift, making its total length 550 ft. from the shaft. This drift has now reached the Crown Point line, and we have started a joint drift with that company to the northeast in quartz of a favorable character. A crosscut will be started in Belcher in a few days to the east for the purpose of exploring a body of quartz in this section of the mine. From the old slopes on the upper levels we have hoisted during the week 18 tons of fair grade ore.

Consolidated California & Virginia.—The south lateral drift, which encountered the ore body 120 ft. south from the winze, 14 ft. below the sill floor of the 1,650 level, has been extended 7 ft. in ore of high grade quality. This makes the total length of the drift 25 ft., in a good quality of ore. The drift has been further extended 4 ft. in a quartz and porphyry formation of low assay value. The ore extracted during the week from the drift, together with some ore of lower grade extracted from the vicinity of the winze, amounted to about 150 tons, the average assay value of which, per car sample, is \$88.91 per ton.

Occidental Consolidated.—From the west ledge above the 400 level we continue to extract about 8 tons of ore per week, of the average value of \$44 per ton.

Savage.—On the 1,050 level east crosscut one started on the north drift at a point 45 ft. from the station, was advanced to a total length of 45 ft., face is in ledge matter. We have upraised from the 8th to the 10th floor, and have extracted from the opening and shipped to the Mexican mill for a concentrating test 105 tons of ore; car samples average \$24.87.

Segregated Belcher.—The east crosscut from the north drift on the 1,150 level has been extended to a total length of 25 ft. The face is in a mixture of porphyry and streaks of quartz. We continue to save a few tons of ore per week from the south raise on this level.

(From our Special Correspondent.)

The following is the weekly tabulated statement of ore hoisted from Comstock mines, with the average car and battery assays, bullion product, etc.:

Mines.	Ore Hoist'd	Car Sample Assay.	Ore Hoist'd	Av. Battery Assay.	Bullion for Week.	Total.
Belcher.....	18 ¹	.....	.....	.....	.....	.....
Con. Cal. & Va.	150	\$88.91	.....	.....	.....	.....
H. A. L. & Norcross.....	141 ²	25.76	.....	.....	.....	.....
Justice.....	100 ³	.....	.....	.....	.....	.....
Occid.....	8	44.00	.....	.....	.....	.....
Savage	105 ⁴	24.87	.....	.....	.....	.....

¹ Fair grade ore. ² Final shipment from accumulations in ore-house. The total amount shipped to the Brunswick mill is 748 tons, the average assay of which was \$24.50, and the battery assay \$18.09. ³ Shipped to the Taylor mill. ⁴ Shipped to the Mexican mill for a concentrating test.

Alta Silver Mining Company.—A shipment of bullion, valued at \$2,577.75, of which \$1,658.09 is gold and \$920.66 silver, has been received at the Santa Fe office of the company. This shipment is the clean-up of the recent test at the mill.

Washoe County.

Reno Reduction Works.—Messrs. Powell, Scott and Barton, who have leased the Reno Reduction Works to work 1,000 tons of ore, commenced operating last week. They are getting the mill in order and have ordered two concentrators and a lot of amalgamating plates. They will work the ores by wet process. They have commenced hauling ore from the Golden Eagle mine, five miles north of Reno.

NEW JERSEY.

Sussex County.

Newton Slate Quarry.—In this quarry, at Newton, work is active, and heavy shipments have recently been made.

NEW MEXICO.

Bernalillo County.

A dispatch from Santa Fe states that R. W. Woodbury, J. W. Bailey, Wm. Gelder, of Colorado, who have been recently in the Cochiti district, will probably put in a mill on the Rio del Medio to treat ores from the Iron King, Lone Star and other mines.

Iron King.—This mine, in the Cochiti mining district, owned and operated by Joseph D. Eagle and Norman B. d'Arcy, has been sold to John Bailey and several Denver capitalists. The consideration is said to be \$20,000 in money and \$50,000 of non-assessable stock. The mine is located in Pino Canyon, near the Crown Point and Lone Star mines, and in the mother vein. It is the biggest sale yet announced from this gold district.

Colfax County.

The gold mines of the Moreno Valley and Ute Creek districts, in this county, are now receiving attention from prospectors, says the Raton "Range." These districts are 40 miles long and from 8 to 10 miles wide. Good paying ore, it is reported, has been found in all parts. There is an abundance of timber and water the year round. Baldy and Black Mountain form a spur diverging in a south-south-east course from the main Sangre de Cristo range. The formations vary from wedge-shaped masses of trachytic eruptive matter to a brittle slate and sandstone which dip in a general north-northeast direction and contain valuable auriferous lodes and placer deposits. The ore is generally free milling, from which about one-half is saved on plates, the remainder going to concentrates. On the western side of the Baldy Mountain and at the head of the Cimarroncito, much of the ore contains a high percentage of iron, which makes it desirable for smelting.

Baldy District.—In this district the Aztec is being developed by the new owners and a large body of ore has lately been opened up which runs \$10 on the plates. They are getting ready to put in a 40-stamp mill and concentrating tables.

Black Horse.—This group consists of five claims. The owners are cross-cutting the two veins at a depth of 750 ft.

Bull of the Woods.—Development work is going on in the Bull of the Woods and the Homestead mines. They have milled some ore at from \$15 to \$100.

Claude Mining and Milling Company.—This company has six claims. The French Henry has a 75-ft. cross-cut tunnel, a 60-ft. shaft and about 200 ft. of drift on the vein. The vein has an average width of 8 ft. of free milling gold ore, which is said to average \$25 on plates. This company has a 2,700 ft. bucket, tramway and will put in a 30-stamp mill and concentrators this season.

Elizabethtown.—On the Elizabethtown side development work is being done in 23 lodes, all of which are said to show up well. The prospectors in upper Cimarron canyon, near the mouth of Clear Creek, have named their camp Perryville and have petitioned the government for a post-office. There are now between 60 and 70 men settled there. Two claims are being developed. The Four Creeks Mining Company has five claims at the head of the Cimarroncito which are heavy in oxide of iron and carry \$80 in gold. Some of it has from 20 to 60 oz. in silver and from 5 to 20% of copper.

OHIO.

Ohio Coal Operators' Association.—This is an outcome of the Cleveland conference, and was organized in that city; it is composed, as its name indicates, of Ohio coal mine operators. The officers are: President, H. L. Chapman, Columbus; Vice-President, J. A. Beider, Cleveland; Secretary, Frank Brooks, Columbus.

OREGON.

Baker County.

Columbia.—The Cable Brothers have their tunnel in 1,000 ft., and are now drifting on the vein. They have a considerable amount of good ore on the dump.

Connor Creek Mining Company.—The long tunnel on this company's property has, it is reported, struck a pocket of rich ore, the extent of which is not yet determined. This mine up to about two years since was a steady producer, but finally the ledge was lost, since which time Captain Myrick has had a force steadily employed running a large

tunnel in the hope of tapping the old vein at greater depth. The tunnel is now about 1½ miles long. It is in this tunnel that the find was exposed.

Nelson Mining Company.—The extensive placer mines in Pocahontas district, owned by this company, stockholders in which are a number of Oakland, Cal., capitalists, are being thoroughly equipped for the season's run and will be started up very soon, says the Baker City "Democrat."

North Pole Mining Company.—Since this company's tunnel struck the vein it has drifted 460 ft., finding good ore nearly all the distance. The mill has been started up.

Phoenix Mine.—Of this mine Superintendent Hardy makes the following statement to the Baker City "Democrat": In the face of the upper tunnel, which is 400 ft. long, giving a depth of 158 ft., there is to be seen a 4-ft. body of ore. The lower is in the same distance and gives a depth of 259 ft. This work exposes a 5 ft. ledge. We followed the ore body the last 128 ft., and are now within 60 ft. of the ledge exposed in the upper tunnel. The five-stamp milling plant on the site will be put up shortly and begin to crush ore.

Grant County.

Lake Creek Gold Mining Company.—This company has bought pipe, hose, etc., to be used in hydraulic working on its claim on the North Fork of John Day River. A Cook amalgamator for saving fine gold is also to be set up.

Union County.

Dolly Varden.—A half interest in this mine has been sold to J. Squire and others, of Portland, who have bought a 10 stamp mill, which is to be put up at the mine at once.

PENNSYLVANIA.

Anthracite Coal.

During the week disastrous floods raged in the coal regions at Pottsville. Every colliery of the Reading Company, except Bast & Preston, No. 3, near Ashland, and Beechwood, near Pottsville, was idle during the early part of the week. The collieries of the Lehigh Valley Coal Company and all of the individual operators are also filled with water. At Shenandoah the Shenandoah Creek flooded the West Shenandoah colliery mine and flooded it. At the other 23 collieries in the vicinity large forces of men had to work day and night digging trenches to prevent the water from flooding them, but met with poor success. At Shamokin the same thing is reported. From Hazleton, dispatches state that the damage is enormous. Millersville colliery is flooded. It will take two weeks to put the mine in shape. At Tomhicken colliery the water broke into the slope forcing the miners to flee to the surface. The Laurel mine was flooded, as was the Crystal Hill. At Honeybrook two slopes were filled and the Stockford colliery was badly damaged. It will take a week to remove the water from the Lattimer mine. At Easton, the Lehigh Coal and Navigation Company was a heavy loser. This company owns the Lehigh Canal and had prepared for a big season. Many boats had begun operations. The canal is washed out and damaged so much that two months of hard work will be necessary to replace it in working condition. Every one of the 14 collieries of the company located at Nesquehoning and Pansford is flooded.

Advices from Hazleton are to the effect that at Eckley Colliery No. 1, Coxe Bros. & Co. have awarded a contract to excavate 250,000 cu. yds. of surface overlying a 50-ft. vein of coal. The work of mining will be proceeded with as fast as the clay can be removed. At Buck Mountain, the colliery which was abandoned 40 years ago by the old Buck Mountain Coal Company and since purchased by Coxe Bros. & Co. is about to be reopened. A number of new houses are being constructed for the employees. It is proposed to haul the coal from Buck Mountain to Eckley by a trolley road. This will be the first electric railway introduced into the Lehigh region for mining purposes. A contract has been given out to remove the 200,000 cu. yds. of earth overlying the coal vein, which is 60 ft. thick and of rich quality. About 150 miners and laborers will be employed about the colliery.

Harry E. Colliery.—This colliery at Brodrick has been idle for four years while the company sank to the lower coal measures and made extensive alterations to the breaker. Machinery will soon be started, says the Wilkes-Barre "Record." The Forty Fort colliery, one-half mile farther up the valley, that has also been idle for over a year for repairs and sinking operations, will be started up at once. They are owned by Simmons & Watkins, of Scranton. Superintendent Alfred Smith has charge of both collieries.

Lehigh & Wilkes-Barre Coal Company.—This company has decided to reopen the old No. 1 Honey Brook mine. Contractors will start work with 100 men, and will increase the force as the work progresses. At Beaver Meadow, S. Vanwickle has decided to strip the vein at Colerain colliery. At Ruan the greatest activity is going on. The Delaware, Susquehanna & Schuylkill Railroad Company are preparing to double the capacity of their yards, and arrangements are being made whereby the company will be enabled to stock its coal during the dull season. These yards will, it is said, have a storage capacity of 150,000 tons.

Slate.

Bangor Fidelity Slate Company.—The stockhold-

ers met at Bethlehem recently and voted favorably on a proposed increase of indebtedness from \$50,000 to \$100,000. It is proposed to make great improvements at the quarry and to extend production.

Blue Diamond Slate Company.—This company, at Slatington, is enlarging its new quarry by opening a series of small beds, on the south side, about 20 ft. thick, says the "Slate Trade Journal." These beds are said to contain valuable material, and will be a profitable addition to the product from the two large beds which are now being worked.

SOUTH DAKOTA.

Lawrence County.

Golden Reward Mining Company.—The weekly clean-up of the chlorination works last week was one of the largest ever made at these works; four buttons weighing 195 oz. were secured, says the Deadwood "Pioneer." The plant is turning out bullion at the rate of nearly \$60,000 per month.

TEXAS.

El Paso County.

San Carlos Coal Mine.—Some of the engines on the Southern Pacific Railroad have been burning coal from this mine for a month, and the results have been so good that it is stated that the Southern Pacific Company has agreed to build a branch from Chispa to the mine, and to contract for a considerable supply of the coal.

UTAH.

Beaver County.

Horn Silver Mining Company.—Work has been started on the new hoisting works and concentrator at the Horn Silver mine at Frisco. The work was held back by the non-arrival of timber, but now sufficient is on hand to begin the work and it will be pushed as fast as timber can be secured, says the Salt Lake "Tribune." Manager Farnsworth thinks the work will be completed by August 1st.

Juab County.

General Logan Mining and Milling Company.—At the annual meeting of this company last week the stockholders authorized a reduction in the capital stock from \$1,000,000 to \$500,000.

It was decided to continue the development of the company's properties in Tintic. The tunnel is now down 200 ft., and the ore gives returns of \$3 gold and a good showing of silver.

Officers were elected as follows: President, W. L. Meyers; vice-president, Samuel Morris; secretary and treasurer, L. O. Schofield; directors, W. L. Meyers, Samuel Morris, L. O. Schofield, J. M. Goodwin, J. H. Whalon, J. F. Delaney and J. F. Walters.

Salt Lake County.

The shipments of ore and bullion from Salt Lake City last week were: Bullion, 609,957 lbs.; silver and lead ores, 986,056 lbs. The receipts of ore and bullion in Salt Lake City for the week ending May 16th were to the aggregate value of \$128,336, of which \$89,781 was in bullion and \$38,555 was in ore. The receipts of Pennsylvania bullion amounted to \$36,410; Hanauer bullion, \$9,600; base bullion, \$20,800; Ontario bullion, \$13,721; cyanides, \$9,250.

Tooele County.

Mercur Mining and Milling Company.—A meeting of the stockholders to confer about the proposed new mill will be held this week, when it is expected everything will be settled and the work begun at once. Owing to the lack of water at the mine, says the Salt Lake "Tribune," it is probable the new mill will be built near the present one, and a tramway built to convey the ore from the mine to the mill, and so do away with the present system of hauling the ore by teams.

VERMONT.

Rutland County.

Baker Red Slate Company.—Plans and specifications have been prepared for a first-class mill to be erected at the quarry of this company, near Poulney. Bids are also asked for the removal of earth and top rock.

WASHINGTON.

Okanogan County.

Condor Mine.—A new tunnel has been started on this claim on Mt. Chapaca and is already in about 30 ft.

Similkameen Placers.—Several men are reported at work on placer claims here and the number will shortly be increased. The parties at work report the prospect encouraging.

Tory Mine.—Active work on the 110-ft. tunnel is to be resumed early in June.

Pierce County.

A new vein of coal has been struck by boring at Wilkeson. So far as shown the vein is about 8 ft. thick, carrying about 5 ft. 6 in. of workable coal of better quality than any heretofore found. The explorations are to be continued.

Snohomish County.

Alzua Placers.—The placer mines, which have been closed for the past three months, will resume operations at once, with L. S. Thomas, of Sultan, as manager and superintendent of machinery and mines, says the Sultan "Journal." Several improvements will be made in the process formerly used at the placers. Undercurrents and blankets will be put in, to save a great deal of the gold dust that has heretofore been lost in the tailings. It is

proposed to employ a force of 10 miners, working night and day, shifts of five men in each.

Hunter Mine.—On this claim at Squaw Creek the tunnel is now in 112 ft. and the owners expect soon to begin crosscutting. The ore taken out so far shows quantities of copper pyrites and some iron.

Monte Cristo District.—The mines in this district are working steadily, and shipments of ore to the Everett smelters are expected to begin early in June.

WYOMING.

Albany County.

Bald Mountain District.—A number of locations have been made in this district, and much development work will be done this summer. So far the principal claims are the Champion and the Smuggler, owned by Hickey, Naismith, and others, both of which are reported as showing well defined veins carrying copper, silver and gold. The Eureka, owned by C. Cole and J. Richards, adjoins these claims, and is of the same character.

Dodge City Placer Mining Company.—This company has 920 acres located near Dodge City, and the company consists of the following named persons: J. T. Dodge and wife, William Taylor and wife, John N. Mertz and wife, W. A. Dodge, M. B. Joy, John Praty, George Riley, T. L. McKee, D. D. McDermott, George W. Fox and John McFarlane. They have commenced work on the ditch, which will be completed by the last of this month. The ditch will carry 4 cu. ft. per second.

Iron Mountain Placer Mining Company.—This company commenced work on its ground and has 680 acres located. A turbine wheel to hoist water will be put in and sluicing will begin as soon as possible.

Virginus.—Development work is now actively in progress on this claim in the Douglas Creek District.

FOREIGN MINING NEWS.

BRITISH COLUMBIA.

Ainsworth District.

(From our Special Correspondent.)

Black Diamond.—The tunnel penetrated the second vein last week at a distance of 280 ft. from the mouth.

No. 1 Concentrator.—This mill started up on April 25th, and has been running successfully ever since.

Nicola Coalfield.

(From our Special Correspondent.)

The Nicola Valley Railroad Company expects to commence work on the road from Spence's Bridge (on the Canadian Pacific) up the valley to the Nicola coalfields, some four miles from the former place. This will open up a very large deposit of bituminous coal, which is said to be of good quality, making an excellent coke.

Kamloops District.

(From our Special Correspondent.)

Savona Cinnabar Mine.—It is reported that reduction works will soon be put up to treat the ore from the mines.

Slocan District.

Noble Five Group.—The sale of a controlling interest in this group of mines is being negotiated with an Eastern syndicate, the price being reported at \$300,000. The group has already shipped 400 tons of ore, which, it is claimed, yielded 150 oz. of silver and 69% lead per ton. There is 700 ft. of tunnel in three divisions already on the property. The width of the vein varies from 2½ to 6 ft., although in one place it is much wider, as in an upraise 9 ft. of solid ore were encountered. A two-fifths interest in the claims is in litigation. Dr. Hendryx and Captain Hayward claim an interest with William and John Hennessey, under a grub-stake contract. The trial will be held at Vancouver, June 1st.

Trail Creek District.

(From our Special Correspondent.)

Le Roy.—Returns on the shipment of 900 tons of ore from this mine give \$54 per ton gold. The miners on this property have struck for increased pay, and it is probable the mine will be shut down until the pumps and hoisting engines are completed.

CHILE.

Nitrate Railways Company.—The report for the year ended December 31st shows: Gross earnings, \$636,292; expenses \$228,934; net earnings, \$407,357. Adding the amount \$91,282 brought forward, together with interest earned and transfer fees, and deducting therefrom the amount required for the service of the mortgage loan, income-tax, accrued interest on preference shares, etc., there remains \$338,565 to the credit of net revenue. Out of this sum an interim dividend of 10% on the ordinary shares and 7% on preference shares was paid in July, 1893, and a like dividend in January last was distributed among the holders of ordinary shares and preferred converted and deferred converted shares, leaving \$60,929. The directors recommend that the balance be carried forward to the next year's account. The Lagunas extension was completely finished and in all respects ready for traffic on January 1st this year, and the directors are daily expecting to hear that the Lagunas Oficina has begun to send its nitrate over it to the port of Iquique. An increase in business in 1894 is looked for.

GREAT BRITAIN.

The total exports of coal, coke and patent fuel from Great Britain in April were 3,008,208 tons; an increase of 621,602 tons, or 26%, over April of last year.

INDIA.

Colar Goldfield, Mysore.—The total output for April was 15,551 oz. gold. For the four months to April 30th the production was 64,460 oz., showing a decrease of 4,790 oz., or 6.9%, as compared with the corresponding period in 1893.

NEW SOUTH WALES.

Considerable quantities of opal are found at White Cliffs, on the river Darling, about 57 miles from Wilcannia, and 783 miles from Sydney. The existence of opal in this remote part of the colony was unknown until within the last few years, but since its discovery large numbers of miners have found employment in the district, there now being a population of 700 where, some four or five years ago, there was only one inhabitant to the square mile. A township has sprung up in the heart of the opal field, and there are a couple of hotels, as well as several stores. A police station and a racing club have been established, together with a progress committee. The opal is found in thin veins in sandstone, the various leases being worked principally on the tribute system, the tributaries in some instances being supplied with food and tools, and getting half the proceeds of the gem. Some £17,000 worth of opal was sold from the field during last year.

British Broken Hill Proprietary Company.—The first report of the new board is issued covering the half-year ending December, 1893. The June half-year showed a net loss of £33,075. From working in the past half-year there is a balance profit of £49, but allowance ought to be made for the fact that £372 of directors' fees previously allowed for have not been claimed, and have been regarded as profit. The total gross receipts of proceeds of silver lead shipments and ore, etc., sold, are set out as £47,297, all of which, but £1,425, has been absorbed in the working expenses of the mine. The total London charges, including £240 for directors' fees in Melbourne, were £2,361.

Gold in New South Wales.—A recently published return from the Sydney Royal Mint shows the gold yield of the colony for 1893, as compared with that of previous years: The total output for coinage in 1893 was 171,097 oz. as against 144,259 oz. in 1892, and 142,470 oz. in 1891, showing an increase over 1892 of 26,837 oz. The gross value for 1893 (for coinage) was £619,071. The western district yielded in 1893 54,896 oz., as against 50,754 oz. in 1892, and 45,622 oz. in 1891. The southern district gave 28,001 oz. in 1893, as against 23,118 oz. in 1892, and 24,506 oz. in 1891. The northern district produced 44,893 oz. in 1893, as against 43,791 oz. in 1892, and 39,652 oz. in 1891. Localities returned as unknown contributed 42,326 oz. in 1893, as against 26,595 oz. in 1892, and 32,689 oz. in 1891. It will be seen that each district shows a material increase in the output, as judged by the quantities sent to the Sydney Mint for coinage. Gold is more abundant in New South Wales than is generally supposed, says a local authority. From Fort Macquarie, 273 miles north of Sydney, to the Queensland border, the coastal district is one continuous goldfield. It is hundreds of miles in length, several miles in width, and there are in it great quantities of alluvial deposit containing gold. Gold is being continually washed upon the beach by the sea, along the whole distance named, it is said; a few hundred yards inland there are what miners call "back terraces," worked profitably. And behind the terraces are conglomerate lodes, which require crushing machinery.

ONTARIO.

Michipicoten.—This Canadian mine, which has not been worked for several years, is now being examined by Capt. Peter Pascoe for account of some Milwaukee capitalists who propose, if the report is favorable, to take hold of the mine and work it. It is located on Michipicoten Island, in Lake Superior.

SOUTH AFRICA.

Diamonds.

De Beers Consolidated Mines.—This company has outstanding at present £3,325,000 in 5¼% debentures, besides £745,000 Bultfontein bonds bearing the same rate of interest. This makes a total of £4,070,000. The company has the right to pay these bonds off at any time at 103. It is proposed to exercise that right and to replace the old bonds by a new issue at 5%, making a saving of about £20,000 a year in the interest account.

Transvaal.

The analysis of the gold production of the Witwatersrand, as given in the monthly statement of the Johannesburg Chamber of Mines, makes the output for March as follows: From mill working, 110,059 oz.; from concentrates, 5,977 oz.; from tailings, by cyanide process, 44,665 oz.; from alluvial workings, 130 oz.; from other sources, 4,542 oz.; total, 165,373 oz. The total of ore worked was 236,385 tons; number of stamps at work, 2,315; average days worked, 27.9; average crushing per stamp per day, 3.65 tons. The total quantity of tailings worked by the cyanide process was 204,421 tons. The average yield of ore from mill working was 9.31 dwts. per ton; average yield of tailings worked, 4.37 dwts. per ton. The companies reporting the largest output were: Langlaage Estate, 12,797 oz.; Robinson,

12,514 oz.; Crown Reef, 10,735 oz.; New Primrose, 7,112 oz.; Jumpers, 5,530 oz.; Ferreira, 5,115 oz.; Durban-Roodepoort, 5,060 oz. The Robinson, hitherto the leading company, was passed in March by the Langlaate.

The April output of the Witwatersrand mines, as reported by telegraph, was 168,745 oz., the largest yet made in any one month. For the four months ending April 30th the output was 635,801 oz., an increase of 210,648 oz., or 49 5/8%, over the corresponding period in 1893. At the usual average value of Witwatersrand bullion, the output for the four months this year is equal to 508,640 fine ounces of gold.

LATEST MINING NEWS.

About 250 well armed deputy sheriffs have gone to Cripple Creek, Colo., to assist the miners in resuming operations. The strikers expect to give them battle at the Victor mine, about six miles from Cripple Creek, where they have thrown up breast-works.

The coal miners' strike continues without change of importance. In West Virginia and Maryland the indications are that work will be resumed at the old scale before long. In other sections the men continue firm. The operators have been holding meetings, and have agreed to stand firmly. Where possible, new men will be engaged.

Hale & Norcross shipped to the Brunswick mill during the week 141 tons 760 lbs. of ore, assaying, per railroad car samples, \$25.76 per ton. This was the final shipment of all the ore which had accumulated in the orehouse at the mine, and makes a total of 749 tons 760 lbs. shipped to the Brunswick mill; average assay, per railroad car sample, of all the ore shipped, \$28.50 per ton; average battery assays, so far as received, \$18.09 per ton.

A boiler in the engine-house of No. 5 of the Lehigh & Wilkes Barre Coal Company, at South Wilkes Barre, exploded May 24th. The house was wrecked. The accident caused the stoppage of the fan supplying air to the men in the mines. It was also impossible to hoist the carriage. With the aid of telephone communication the men below were warned of their danger. The men made their escape from the mine by way of Stanton shaft. As soon as the fan stopped and the gas began to accumulate messengers were sent through the mine to give warning, and the miners and laborers at once threw down their tools and fled. The force of the explosion was so great as to destroy the foundations of several houses in the vicinity. No. 5 shaft is reported to be the most gaseous one in that section.

At several points the strike of the coal miners has reached the stage of bad blood, and conflicts are reported between the miners and the guards protecting the property of the operators. In the coke region of western Pennsylvania, in the neighborhood of Uniontown, such a fight occurred on Thursday, May 24th, between a party of deputy sheriffs and a body of miners who attempted to prevent others from working. The result of the fight was the killing of five miners and the wounding of several deputies. As usual in such cases, it is difficult to determine from the telegraphic accounts which party began the fight.

In southern Illinois also there was some rioting, and on Thursday a party of strikers did considerable damage to some of the mines near Centralia, wrecking the machinery and throwing rubbish down the shafts.

At the Spring Valley mines in Illinois a fire broke out in one of the shafts. The striking miners refused to permit any men to go down to fight the fire, but the managers of the mine succeeded in securing help and taking measures to put out the fire, in spite of the opposition of the men. This seems to have been an extreme case, and the dispatches state that many miners were opposed to the course taken by the majority of their associates.

(From our Special Correspondent.)

JOPLIN, May 21st.

We can report but little change in the situation of the lead and zinc mining industry of this district. The different purchasing agencies of zinc ore were all in the market and seemed ready to take everything offered at an average price of \$16 per ton. Some sales of ore are reported made at Webb City and Cartersville at \$18 per ton. Lead ore declined 25c. per thousand and closed at \$17.75. Following are the sales of ore from the different camps: Joplin, 981,390 lbs. of zinc ore and 344,550 lbs. lead, value \$14,458; Webb City, 1,211,640 lbs. of zinc ore and 59,580 lbs. lead, value \$10,735; Cartersville, 932,230 lbs. zinc ore and 158,220 lbs. lead, value \$10,227; Zincite, 49,660 lbs. of zinc ore and 19,990 lbs. lead, value \$747; Oronogo, 9,080 lbs. of zinc ore and 48,700 lbs. lead, value \$1,565; Galena, Kan., 1,144,000 lbs. of zinc ore and 233,570 lbs. lead, value \$12,948; district's total value \$50,630; Newton County, 348,200 lbs. of zinc ore and 74,100 lbs. lead, value \$4,183; Aurora, 1,134,000 lbs. of zinc ore and 190,000 lbs. lead, value \$9,709; lead and zinc belt's total value \$64,572.

Messrs. Lichter & Lear are still pushing development on their 200-acre tract of land between Joplin and Webb City, but as Mr. Lichter informs us, he is giving his entire attention to prospecting

and developing, and will not stope out any of the ore bodies now exposed until there is an advance in the price of ore. Many other operators are following the same plan.

The latest advices from Butte, Mont., say that all of the mines of the Butte & Boston Company which suspended work owing to the Great Northern strike have resumed, and are being worked as usual. Owing to the absence of Captain Couch, of the Boston & Montana, the usual number of men at some of these properties is not now employed, but it is believed that next week all of the mines will be worked with a full complement of men. The copper market is improving; the demand for electrolytic copper continues.

The Anaconda properties are being worked on their usual large scale, and regular shipments are being made to the smelter. The new converter plant, which has a capacity of turning out 10,000,000 lbs. of copper each month, is hard at work.

Among the silver producers of the district there is very little activity. At the Czarina and Jennie Dell the rich strikes recently made at these properties will keep the lessees busy for a few months, but at the present price of silver there will be no big money in it for anybody. A number of leasers are yet engaged around Walkerville and west of Missoula Gulch, but beyond the fact that they are working hard to open up pay ore ground, they have nothing to report.

Placer mining will engage the attention of a larger number of prospectors this year than ever before. The water supply for the season will be adequate for all purposes on account of the heavy snowfall of the past winter, and few districts where colors exist will be neglected. There is said to be good diggings in Granite County to the west of Phillipsburg, but as the season for work is short and the distance to bedrock great, but little work has been done there. A number of Butte men are now outfitting for a trip there when the snow goes off the mountains, and they will no doubt thoroughly test that section for gold deposits.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 25.

Statement of shipments of anthracite coal (approximated) for week ending May 19th, 1894, compared with the corresponding period last year:

	1894.	1893.	Difference.
	Tons.	Tons.	
Wyoming region.....	545,012	489,975	Inc. 55,037
Lehigh region.....	168,535	134,590	" 33,945
Schuylkill region.....	258,626	233,400	" 25,226
Totals.....	972,173	857,965	Inc. 114,208

Total for year to date, 12,627,713 15,558,324 Dec. 2,330,611

PRODUCTION OF BITUMINOUS COAL, in tons of 2,240 lbs., for week ending May 19th and year from January list:

	1894.		1893.	
	Week.	Year.	Week.	Year.
Shipped East and North:				
Phila. & Erie R. R.....	31	23,554	46	46,400
Cumberland, Md.....	13,737	1,242,755	1,509	1,509,776
Barclay, Pa.....	210	9,161	26	26,997
Broad Top, Pa.....	139	122,196	132	294,536
Clearfield, Pa.....	444	1,120,919	444	1,684,066
Allegheny, Pa.....	470	472,851	470	517,630
Beech Creek, Pa.....	682	834,841	682	682,853
Pocahontas Flat Top.....	78,690	1,206,633	78,690	1,278,680
Kanawha, W. Va.....	31,816	910,224	31,816	1,246,192
Totals.....	126,219	5,943,156	126,219	7,286,024

	1894.		1893.	
	Week.	Year.	Week.	Year.
Shipped West:				
Pittsburg, Pa.....	16,671	489,476	16,671	511,586
Westmoreland, Pa.....	5,752	507,124	5,752	817,771
Monongahela, Pa.....	370	163,536	370	200,409
Totals.....	22,793	1,160,136	22,793	1,589,766

Grand totals..... 149,012 7,103,292 8,875,810

PRODUCTION OF COKE on line of Pennsylvania R. R. for the week ending May 19th, 1894, and year from January 1st, in tons of 2,000 lbs.: Week, 12,715 tons; year, 1,116,775 tons; to corresponding date in 1892, 2,168,111 tons.

Anthracite.

So far as trade features—actual buying and selling—are concerned, the anthracite coal market shows no change from last week.

The disastrous floods in the coal regions have been the chief topic of discussion during the week. In our mining news columns will be found a detailed account of them. The effect has naturally been to decrease production. It had been decided to increase the May output to 60% of the capacity instead of one-half; but the damage done by the floods will probably show in the past week's decreased tonnage. While it means a loss of money to the operators it cannot be said that it has affected the market; no scarcity of coal need be apprehended, and the railroads can easily handle an increased tonnage in the next few weeks.

The question of June prices continues to be much discussed. A canvass of the trade shows that the majority of the sales agents are not in favor of an advance. The representative of one of the leading companies, however, said that there would probably be an advance of 25c. on stove and chestnut, and 10 or 15 on egg. Broken would be left unchanged, in order to separate it from egg. The object of the advance is naturally to stimulate business.

That is a plea which is always heard when business is dull, and it may be taken for what it is worth. Anthracite is to-day selling as low as it is likely to go this year, and freights are very cheap;

these facts are realized by most buyers. A prominent sales-agent, whose opinion goes far at the monthly meeting, summarized the situation by saying: "There is no need of an advance. Those buyers whose financial condition is good are buying now as much as can be expected. For the rest of the trade we do not care. We prefer to wait until the fall, when they will be compelled to pay higher prices and at less pecuniary risk to the operators."

That is the opinion of other agents; but, of course, there is no telling what may be done at next Tuesday's meeting. Prices to-day are rather weak, and coal is selling at 10@15c. below the net circular rates, after taking off the usual discounts and commissions, and it may be deemed advisable to advance prices officially to strengthen them as well as to "stimulate business."

The sales agents always deny that any of the companies are ever guilty of "shading" the official circular, and when it is shown to them that coal has been sold for less, they always excuse it by pleading that it was on an especially desirable order. Doubtless the individual operators are guilty of cutting oftener than the companies, but to our own knowledge at least two of the companies have been selling and offering coal, not only here but in Boston, at a lower figure than a strict adherence to the circular would justify. This may be news to some of the sales agents who habitually affect to disbelieve the possibility of such a thing.

The demand for steam sizes shows some increase, due, to a certain extent, to the prolonged bituminous coal strike.

The Reading Railroad reports that its coal shipment (estimated) for last week, ending May 19th, was 216,000 tons, of which 20,000 tons were sent to Port Richmond and 35,000 tons were sent to New York waters.

Bituminous.

It is a most unsatisfactory task to write a review of the bituminous trade just now, for it may be said that there is no market. The strike of the miners has proven an unpleasant surprise by its strength and duration. The end is, of course, only a question of time, and a short time at that, but it is a very serious question, which grows in gravity with every day of idleness.

There seems to be more coal in the market this week than there was last, although it can scarcely be said that this coal is on the market at all as it is all placed before it is shipped. It is very carefully husbanded, indeed.

Consumers appear to have become accustomed, as far as they can be, to the situation. They inquire from their regular contractors as to the probabilities of getting coal and then proceed to make arrangements to meet their wants in other ways.

As we stated last week the large stocks were secured in anticipation of the strike, which was all the provision that could be made. Those stocks which were put afloat by producers after the strike commenced and before the railroads had seized all coal en route, are pretty well used up. It is estimated that in New York harbor there is on hand, now afloat, from 7,000 to 10,000 tons held by producers supplying the seaboard. This, however, is being increased to some extent by outside coals which are beginning to arrive. Some of the Welsh and Nova Scotia coal, to which we referred in our last week's issue, has been received this week.

Prices are nominal, there being practically no coal for sale. It is said that some of the steamers have paid as high as \$6.50 alongside, but this could not be verified. The highest prices that we have been able to discover is \$4.50.

It is reported that the Baltimore & Ohio Railroad is releasing small quantities of the coal which it seized at the time the strike in the Cumberland region took place, and we understand that some shipments are being made from Staten Island.

We quote ocean freight rates as follows from Philadelphia: To Boston, Salem, Portland, Portsmouth, Bath, Gardiner and Bangor, 60c.; Providence, New Bedford, New Haven, Bridgeport and Allyn's Point, 55c.; Wareham, 75c.; Lynn and Newburyport, 65@70c.; Dover, \$1 and towages; Saco, 75c. and towages.

The Pocahontas region is making heavy shipments, and has a large vessel tonnage at the shipping ports. The George's Creek region is producing about 2,500 tons daily. A few mines are reported in operation in West Virginia, but the output is small.

The outcome of the Cleveland convention has been to make the operators more determined in their refusal to change the wage scale. The action of the men was, to say the least, ill-timed and ill-advised. In many sections popular sympathy is being alienated by the acts of violence. The operators have announced their intention to get new men.

Buffalo.

May 24.

(From our Special Correspondent.)

Anthracite coal in good demand for family and manufacturing purposes. The scarcity of bituminous coal is the cause of the call for hard coal, which is burned as a substitute in many small establishments. Prices of anthracite are without change and what little bituminous changes hands, otherwise than on contract, brings high figures.

Lake freights on coal to Chicago have advanced 5c. per net ton. A fair general movement was shown last week, but this week the shipments have fallen off, and at the close the market was dull.

The shipments of coal by lake from Buffalo for

the week ending May 19th aggregated 70,778 net tons, distributed thus: 35,788 tons to Chicago, 12,600 to Milwaukee, 3,800 to Duluth, 940 to Sheboygan, 5,900 to Superior, 1,500 to Racine, 1,200 to Saginaw, 300 to Bay City, 1,250 Cheboygan, 5,000 to Gladstone, 1,080 to Manitowoc and 1,340 to Port Huron. The rates of freight were 35c@40c. to Chicago, 35c. to Milwaukee, Manitowoc, Saginaw, Racine and Sheboygan; 25c. to Bay City and Cheboygan; 30c. to Port Huron, and 15c. to Duluth, Gladstone, Superior and Dundee.

There is little movement by canal eastward of coal, and rates are not made public.

The Board of Supervisors of Erie County have advertised for egg, grate and nut anthracite coal for the use of the armory, almshouse, penitentiary, etc., for one year from June 1st. No quantity stated.

Canadians are complaining bitterly that soft coal intended for several places in the Dominion has been "gobbled up" by the railroad companies in transit for the use of their engines. Of course, these people will be reimbursed by the companies, but that does not help the situation.

A storm lasting from 40 to 60 hours prevailed over the upper lakes, commencing on May 18th. Great loss of life and vessels was recorded, but the final result in numbers has not been compiled yet, for every hour brings further accounts of craft foundering or missing.

Last Saturday and Sunday South Buffalo and, in fact, all western New York were under water, in consequence of the extraordinary and continuous heavy rains which prevailed for three days. Buffalo River was on the rampage with a 50-mile current! Incoming vessels had to lay off the breakwater, as tugs could not handle them.

Latest.—Lake freights on coal have again advanced 5c. to Chicago and Milwaukee; the rate to the former port being 45c. and to the latter 40c.—with a goodly number of vessels placed.

Chicago. May 23.

(From our Special Correspondent.)

Anthracite coal has improved considerably in sales during the week. The stock of hard coal in this market at the present time is estimated at about 225,000 tons, which is somewhat below the usual average. Chicago and its outside territory require a considerable tonnage of hard coal. Shipments of anthracite to Chicago just now are limited. The circular rates are not being strictly adhered to; dealers are cutting them from 15 to 25 cents. Circular prices are \$5 for grate and \$5.25 for egg, stove and chestnut.

Bituminous Coal.—The soft coal situation for Chicago and vicinity is growing more serious with each day. Already many factories, furnaces, etc., have been compelled to close down for want of fuel. West Virginia coal still continues to be sent here in limited quantities, the receipts being about equal to last week. Some of the railroads and a number of the larger manufacturing concerns in this locality are hustling in all directions for coal. A number of them have managed to obtain supplies sufficient to last them a few weeks. Kentucky continues to send in coal, but in such quantities as are hardly noticeable considering the present state of the market. The cost of coal at present to the consumer is all the way from \$3.50 to \$4.25 per ton of 2,000 lbs., f. o. b. Chicago.

Coke is in large demand, and the supply does not nearly reach the call. The Pocahontas and Fairmount fields are the only source of supply, but the shipments from them are inadequate. Quotations on coke are \$4.50@5 per ton.

Pittsburg. May 24.

(From our Special Correspondent.)

Coal.—The Cleveland convention met, quarreled for two days, adjourned without accomplishing anything. The fight will be carried to the bitter end. The railroad men have advanced the price of mining to 65 cents, but refuse to deal with the leaders, and will sign a contract with the men. The coal men say they will wait a short time, and if the men do not return they will employ others and will protect them if it takes thousands of armed deputies to do so. The question must be settled. The strikers are evidently losing ground. The river coal-owners are in no hurry to start up with the lower markets all stocked up with coal; the longer the strike continues the better for them, as it enables them to dispose of their coal in the lower markets at fair prices. There is plenty of water, but no coal is being shipped; prices are nominal.

Connellsville Coke.—The reports from the coke regions are so conflicting that it is hard to know what to think of the situation. Where work has been resumed it is largely by the English-speaking men. The foreigners are very firm against going to work, and many of them have been turned out of the company's houses; it is estimated that over 300 families have been evicted. All plants have additional forces of workmen; old workmen are joining the forces every day and forsaking the strikers. The Frick men have, in many instances, notified the company that they are ready to return when they resume operations at the plants in which they were employed. Destitution among the strikers is increasing, and beggars are numerous. The Rainey Company has received a carload of fine horses at Moyyer, and has organized a mounted police force, armed with repeating carbines and revolvers. The officials say they can reach any of their plants in one hour and disperse any mob with this force. Reports of pro-

duction differ. Amount, 540 cars distributed to Pittsburg, East and points West; prices too unsettled to contain any information.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 25, 1894.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending				From	
	May 12, 1893.	May 11, 1894.	From Jan., '93.	From Jan., '94.	Tons.	Tons.
Anthracite.	69	33,450	34	17,430	698,717	335,409
Coke.....	147	142,230	71	85,670	2,839,767	1,917,516
Charcoal...	37	8,580	19	4,235	193,065	83,933
Totals...	253	184,260	124	107,335	3,732,149	2,337,888

Pig Iron.—The demand for pig iron shows no improvement, but, on the other hand, it has not decreased appreciably, which, considering the growing scarcity of fuel, is as much as can be expected. While there has been no change in prices of pig iron in this market, there is a belief that an advance will take place before long. Freight rates from Pittsburg and the West to New York and Eastern points will be advanced about 50c. a ton on June 15th, and business generally is improving.

Southern furnaces are still suffering from the coal strike. The Tennessee Coal, Iron and Railroad Company has orders booked for nearly 130,000 tons, and some of its furnaces have withdrawn from the market. The Sloss Iron Company is also practically out of the market excepting for No. 1 iron. Soft irons are very scarce and spot lots are hard to obtain.

The Northern furnaces, although not so well off in orders, are not pressing their product for sale. Quotations at tidewater are as follows: Northern brands, No. 1, \$12.50@13; No. 2, \$11.50@12.50; grav forge, \$10.50@11. Southern irons, No. 1, \$12@13, No. 2, \$11@11.50; No. 1 soft F., \$11@11.50; No. 2 soft F., \$10.50@11.25. Scotch irons are quoted: Coltness, \$21.50@22; Eglinton, \$19.50@20; Summerlee, \$20.50@21.50.

Billets and Rods.—Buyers are not coming into the market owing to the advance in prices caused by the coke strike. They are holding off in expectation of the former low prices. Quotations are nominally: Domestic billets \$18.50@19; wire rods, domestic, \$27@27.50; foreign rods, \$39@40.

Manufactured Iron and Steel.—Prices are firmer owing to the advance in raw materials. The demand has been light, buyers preferring to wait until the coke troubles are settled. We quote this week: Angles, 1'20@1'40c.; axles, scrap, 1'40@1'60c. delivered; steel, 1'40@1'55c.; bars, common, 1'15@1'30c.; refined, 1'25@1'40c. on dock; beams, up to 15 in., 1'35@1'50c.; channels, 1'35@1'50c. on dock; steel hoops, 1'45@1'75c., delivered; links and pins, 1'40@1'65c.; plates, flange, 1'60c. @1'80c.; fire-box, 1'80@2'10c.; 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, 1'40@1'60c., all on dock.

Merchant Steel.—Prices are a shade higher and much firmer owing to the increased cost of raw material. There has been no improvement in the demand, however. Quotations are as follows: Tool steel, 5'75@6'25c.; tire steel, 1'60@1'75c.; toe calk, 1'70@1'90c.; Bessemer machinery, 1'25@1'50c.; open-hearth machinery, 1'90@2c.; open-hearth carriage spring, 1'90@2c.; crucible spring, 3'50@3'75c.

Old Material.—There is not much doing in old material. We quote nominally as follows: Old steel rails, \$9@9.75; old iron tees, \$10.50@11.50 per ton; New York railroad scrap, \$11.50@12 per ton delivered at mill, and yard scrap at \$10; wrought turnings, delivered at mill, \$8.50@9; No. 1 wrought scrap at \$9.50@10.50 from yard, and machinery cast scrap \$9@10; old wrought tubes and pipe, \$6.50@7; old car wheel, \$9.50@10.50 New York; cast borings, \$6@6.50 delivered at mill.

Rail Fastenings.—We do not hear of any sales of fastenings. Quotations are as follows: Fish and angle plates, 1'20@1'40c. at mill; spikes, 1'50@1'75c.; bolts and square nuts, 2@2'25c.; hexagonal nuts, 2'10@2'30c., delivered.

Spiegeleisen and Ferromanganese.—This market continues exceedingly quiet. Quotations remain nominally: Spiegeleisen, 10@12%, \$21@22; 20%, \$25@26. Ferromanganese, \$51.50@53.

Steel Rails.—No sales of standard sections are reported this week. Prices are still \$24 at mill or \$24.80 tidewater. Some business is doing in girder rails, which are quoted at \$21@24 at mill.

Buffalo. May 24.

(Special Report of Rogers, Brown & Co.)

There is a firmer feeling in this market, due more to the withdrawal of sellers than from an improvement in demand, although in this latter respect some little improvement is shown through an increase of shipments. A well defined scarcity of one or two of the popular grades of Southern iron has developed, and furnaces are asking 25c. per ton advance on these. The prospect of an advance in freight rates from the West and South has caused sellers to withdraw quotations for future delivery, which were based on existing rates. We quote below as

the range of this market f. o. b. cars Buffalo cash basis: No. 1 Foundry strong coke iron, Lake Superior ore, \$11.50; No. 2 foundry strong coke iron, Lake Superior ore, \$11.00; Ohio strong softener No. 1, \$11.50; Ohio strong softener No. 2, \$11; Jackson County silvery No. 1, \$15.50@16.50; Lake Superior charcoal, \$14.75; Tennessee charcoal, \$15.50; Southern soft No. 1, \$11; Southern soft No. 2, \$10.50; Alabama car wheel, \$16@17.50; Hanging Rock charcoal \$18.50.

Chicago. May 23.

(From our Special Correspondent.)

Fuel is now becoming an important factor with the furnaces, mills, etc., throughout the West. A number of them are reported out, and there are many merely banked awaiting a possible early settlement of the coal and coke strikes. The demand for all classes of iron for the week has improved to some extent, probably because production is becoming limited. Prices are firmer, and conditions look good for an increased business should the labor troubles be soon settled.

Pig Iron.—There is a slight improvement in the pig iron market over last week. Sales in small quantities have footed up a fair tonnage, and a few noticeably large ones have increased the total to an extra good week's business. Northern iron shows the greater sale, Southern iron being affected by the strike, so that some grades are very scarce, and the furnaces that are still in blast are not inclined to press sales while the labor trouble lasts. The furnaces now running in this vicinity cannot keep in blast much longer, and there are already several banked. Should the strike force all the furnaces to shut down, the stocks on hand would probably last a month or more. Prices are, per gross ton f. o. b. Chicago: Southern coke, foundry No. 1, \$10.75@11; No. 2, \$10.25@10.50; No. 3, \$9.75@10.00; Southern coke foundry soft, No. 1, \$10@10.25; No. 2, \$9.75@10.00; Southern car-wheel, \$17.50@18; Tennessee charcoal No. 1, \$13.75@14; Southern silveries No. 1, \$11.75@12; No. 2, \$11@11.50; Bessemer, \$12.50@13; Ohio Scotch softeners No. 1, \$12.75@13.50; Lake Superior charcoal, \$15@15.50; Lake Superior coke No. 1, \$11.25@11.75; No. 2, \$10.25@10.75; No. 3, \$10.00@10.25; Jackson County silveries, \$14.50@15.

Structural Iron and Steel.—The demand has increased somewhat, a few sales of fair proportions having been made chiefly to a few large buildings now under erection in this city. Quotations are, f. o. b. Chicago: Angles, 1'35@1'45c.; tees, 1'55@1'65c.; universal plates, 1'35@1'45c.; beams and channels, 1'35@1'45c.

Plates.—Demand for plates during the week has been small. Prices have increased a trifle. Flange steel is quoted at 1'70@1'80c.; best firebox steel, 3'75@4'25c.; tank steel, 1'35@1'45c.; boiler tubes, 75% discount.

Merchant Steel.—Business has increased materially during the week. Sales amounting in the aggregate to a considerable more than previous one. Quotations are, carload lots: Smooth finished machinery, 1'80@1'90c.; tire steel, 1'70@1'80c.; ordinary Bessemer bars, 1'40@1'50c.; toe calks, 2'05@2'15c.; special brand tool steel, 12@20c., crucible spring, 3'40@3'65c.; tool steel 6½c. and upward.

Galvanized Sheet Iron.—Sales continue few and for small quantities. Quotations are 77½@80% discount mill shipments and 75, 10 and 5% on warehouse trade.

Black Sheet Iron.—A better inquiry is noted. Jobbers are coming into the market more. With each week prices are becoming firmer. Some mills are marking up prices as much as \$1 per ton. The prevailing prices are now 2'35@2'40c. f. o. b., Chicago.

Bar Iron.—In view of the almost certainty of the mills closing down, sales have increased considerably during the week. The Valley mills are quoting 1'5c. f. o. b. Chicago, steel bars being 1'25c.

Billets.—Conditions remain as last reported. Deliveries later than July are being refused prevailing prices, which are \$18.50@19.

Steel Rails.—Small orders continue to make up quite a good total tonnage. A few good sized orders are likely to materialize shortly. Prices are \$25@27.

Nails.—Both wire and steel cut nails have been in fair demand. Prices per keg are \$1@1.10.

Old Rails and Wheels.—Small sales of old iron rails and wheels have been made during the week. The railroads are selling a trifle cheaper than heretofore. Present prices are old iron rails \$9.75@10.25. Car-wheels, \$10@10.50.

Scrap.—A few sales of ordinary proportions have been made, but business is yet extremely slow. Prices are: Forge, \$8.50@9. Cast borings, \$3.50@4; wrought turnings, \$4.50@5; axle turnings, \$6@6.50; mixed steel, \$5@5.50; tires, \$12.50@13; iron axles, \$14@14.50.

Pittsburg. May 24.

(From our Special Correspondent.)

Raw Iron and Steel.—The condition of the market is such that correct information is difficult to obtain, the views of well-informed dealers being wide apart. The cokemen are evidently determined to fight it out on the lines first laid out, refusing to recognize the labor leaders. There are thousands of miners who consider the Frick scale a fair one, and many are working under and others would be

but are held back by the strikers; the end is evidently not far off. The demand for early deliveries of Bessemer pig and soft steel billets was active, the market being nearly bare; prices maintained, the tendency being to higher figures. A few weeks ago a party who had a good bank account, that he had no particular use for, after watching the weekly sales of iron and steel, estimating their true value, called in a leading broker and authorized him to purchase 20,000 or 25,000 tons Bessemer. The purchase was made and the cash handed over, the price being \$10@10.75 per ton; last week this metal was resold for immediate delivery at over \$13 per ton cash.

The inability of many concerns to produce fuel to handle raw material has caused their withdrawal from the market, so that the volume of business handled is relatively small and is steadily shrinking. Evidences are not lacking that the actual consumers of iron are in want of material, and would take it if there was any certainty when delivery would be made, but they are holding off until the situation becomes clearer. In the mean time but a limited business is being done, although orders are being accepted for small lots when the terms are such that delivery dates can be satisfactorily arranged. There is very little Bessemer iron, but a plentiful supply of other grades. Scarcity of foundry coke has curtailed the consumption of crude iron, but at the same time production has declined so that there is not much pressure on the part of makers to realize. Grey forge advanced 25c. per ton.

Latest.—The market is bare of Bessemer steel billets and Bessemer pig, and prices are very firm; the tendency of iron and steel products is upward. The following articles have advanced: Grey forge and mill, 30c. per ton, with light demand; billets and bar ends are 75c. per ton higher; steel wire rods, 40c. per ton higher; sheet bars advancing; skelp iron advanced, sheared 2½c. per 100 lbs., wide and narrow grooved 10c. per 100 lbs.; skelp steel advanced, sheared 5c. per 100 lbs., and wide and narrow grooved 10c. per 100 lbs. Foundry irons held at an advance.

Coke Smelted Lake and Native Ore.		Charcoal.	
Tons.	Cash.		
10,000 Bessemer, spot.	\$13.20	100 Cold Blast.....	23.50
7,500 Bessemer, June, July.....	11.80	100 Cold Blast.....	23.50
5,000 Bessemer, June, July.....	12.10	50 No. 2 Foundry.....	16.25
5,000 Bessemer, spot.	13.20	50 Extra Foundry.....	27.40
2,500 Bessemer, June, July.....	12.25	50 Cold Blast.....	23.50
2,500 Bessemer, August.	11.75	Skelp Iron.	
2,000 Bessemer, June, July.....	12.15	700 Wide gr'vd.....	1.35 4 m.
1,000 Bessemer, June.	12.25	400 Nar. gr'vd.....	1.35 4 m.
1,000 Bessemer, June.	12.20	320 Sheared.....	1.42½ 4 m.
1,000 Bessemer, June.	12.20	Skelp Steel.	
1,000 Bessemer, June.	12.15	620 Wide gr'vd.....	1.20 4 m.
500 Bessemer, spot.	13.10	580 Sheared.....	1.30 4 m.
500 Bessemer, spot.	13.15	400 Nar w gr'vd.....	1.20 4 m.
500 Off Bessemer.	11.25	Spelter.	
500 Neutral prompt.....	20.00	100 per 100 lbs.....	3.30
500 White and Mottled.....	9.25	100 per 100 lbs.....	3.35
500 Gray Forge.....	9.75	50 per 100 lbs.....	3.35
100 No. 3 Foundry.....	10.00	Muck Bar.	
100 No. 1 Foundry.....	12.00	500 Neutral prompt.....	20.00
100 No. 2 Foundry.....	11.00	Blooms, Billets, Bar Ends.	
100 No. 1 Silvery.....	13.50	500 June.....	11.80
100 No. 2 Silvery.....	12.00	Steel Wire Rods.	
50 Open mill.....	9.75	700 5 gauge American, prompt at mill.....	25.00
Blooms, Billets and Slabs.		Old Rails.	
3,000 Billets, June, July, Aug., at mill.....	18.25	300 Iron rails.....	12.00
3,000 Billets, June, July, at mill.....	18.50	150 Steel rails.....	9.25
1,500 Billets, June, July, at mill.....	18.20	Scrap Iron.	
800 Billets, prompt, at mill.....	19.00	250 No. 1 R. R. W. Scrap, net.....	9.75
500 Billets, spot, at mill.....	19.25	150 Cast scrap, gross.....	8.60
		75 Car wheels, gross.....	9.00
		75 Soft steel scrap, gross.....	8.25
		Sheet Bars.	
		500 Sheet bars, prompt.....	22.40

Philadelphia. May 25.

(From our Special Correspondent.)

Pig Iron.—Brokers confess surprise at the dullness and low prices of iron in view of higher freight rates and increasing scarcity. They predict another advance in Bessemer. Forge iron is dull at \$10.50, and mill owners take no interest in the market. Foundrymen and stovemakers are heard from often, but their purchases are not very large. Both are allowing the future to take care of itself. No. 1 can be had at \$12.50; No. 2, \$11.50.

Steel Billets.—Users of billets are getting close to the end of their stocks in most cases. They say present quotations, even were deliveries possible, cannot be sustained. Two or three would shut down their rolling departments before paying \$19.75, quoted to day. The feeling is one of indifference rather than anxiety.

Merchant Iron.—Bars are active, and mill production is quickly absorbed at 1:30 for refined; store, 1'40@1'50. Large buyers are in the market, and they show a good deal of anxiety over summer supplies owing to the coal strike.

Nails.—Under reduced output prices are said to be firmer, but not higher, except in retail lots in stores. Cut are sold at 95c. delivered; wire, \$1.10.

Skelp.—The skelp mills have more work on hand and in sight than they have had at any time for over a year, and manufacturers see a greater demand 30 days ahead. Grooved, 1'20.

Sheet.—The reduced supply has allowed prices to harden. The card is the same but selling prices are slightly higher.

Pipes and Tubes.—But for the coal supply more business would be booked. Inquiries are coming in and people are ready for supplies, but some mills are not in shape to promise summer deliveries.

Plate.—The storm and rain have done damage to rolling mills in many places, and production is checked in consequence. Small lots of steel plates were ordered this week at \$2 per ton above last week's prices, early delivery. Managers of work on hand calling for plates are more anxious about material.

Structural Material.—Brokers live in hope that some contemplated railroad bridge-work will be hastened, but there is very little new business. No change in quotations.

Steel Rails.—The only business heard of this week is in girder rails.

Old Rails.—Iron are quoted at \$12.

Scrap.—Heavy is offered at \$10.50 and light at \$8.50.

METAL MARKET.

NEW YORK, Friday Evening, May 25, 1894.

Prices of Silver per Ounce Troy.

Mar.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	May.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
19	4.88½	28½	63¼	.482	23	4.88½	28½	63¼	.481
21	4.88½	28½	62¾	.485	24	4.88½	28½	61¾	.479
22	4.88½	28½	62¾	.485	25	4.88½	28½	62¾	.482

The market early in the week had a slight advance on orders for the Japanese mint. These having been filled, price receded and the market closes steady at 28½d. The indications do not favor any violent change in the value of the white metal, small fluctuations being the order of the day.

The United States Assay Office in New York reports total receipts of 63,000 oz. silver for the week.

Gold and Silver Exports and Imports at New York, Week Ending May 19th, 1894, and for Years from January 1st, 1894, 1893, 1892.

	Gold.		Silver.		Excess of Ex. or Imp.
	Exports.	Imports.	Exports.	Imports.	
Week	\$7,677,450	\$941,129	\$881,027	\$30,186	\$7,587,162
1894.....	33,578,114	7,813,268	15,690,573	594,901	\$19,890,518
1893.....	56,788,606	5,682,461	11,561,994	1,147,721	\$43,507,490
1892.....	23,548,893	6,068,361	9,284,719	546,136	\$17,756,997

Of the gold exported for the week \$3,750,000 went to London, \$1,850,000 to Germany, \$700,000 to France and the balance to the West Indies; the silver all went to London. The gold imported was from France and England; the silver from the West Indies and South America.

NOTES OF THE WEEK.

A general review of the week is necessarily to a great extent a repetition of that of the previous week. There are signs of improvement, but the disturbing elements are still strong; they are, as before, chiefly the tariff discussion and the great coal strike, both of which promise to remain unsettled for some time. Otherwise, it may be said that the demand for new material is on the increase, and our market reports indicate slight improvements in prices. Some of these, however, are due to interruption to production resulting from the strike.

The tariff discussion seems to be really making some progress and there are signs of a disposition to hurry matters a little, probably on account of the approach of the warm and unhealthy weather. The Senate has considered a number of the schedules without making material changes from the committee report.

The coal strike, which still continues and has even extended, seems still far from a settlement. The resort to violence is always a sign of the apour news and editorial columns.

A local feature worth noting is that, while the general depression has limited transactions, there has not been, at any time since the late panic began, any appreciable fall in the value of real estate in and about New York. The prices asked for property have been well maintained all through the depression, and it may be added that the number of foreclosures and forced sales has not been as large as might have been expected. Rental values this spring also show generally no decrease.

Gold exports still continue on a considerable scale. The mid-week steamers from New York carried out proaching end of a strike, however, so that there is some prospect of an end before long. Some account

of the strike and comments upon it will be found in \$1,300,000, but only some \$900,000 more is reported taken for Saturday's steamers, so that the total for the week will be \$2,200,000. No specific cause for exporting gold at the present time can be named, beyond the facts already noted, that there is more demand for money in Europe (than here just now, and that exchange continues above the point at which it will pay to ship gold. On Friday, however, there was a drop in exchange rates to just below the gold exporting point, which prevented the shipment of more gold, which had been generally expected.

The statement of the New York banks for the week ending May 19th shows decreases of \$1,635,450 in reserve, \$475,100 in loans, \$2,027,000 in legal tenders, \$930,400 in deposits, and \$44,200 in circulation; an increase of \$156,700 in specie. The total reserve was \$223,545,600, being \$78,990,125 above the legal requirements. The further accumulation of money here seems to be checked for the present; but loans have decreased, the first time in several weeks.

The report of the United States Treasury on Thursday, May 24th, showed balances in excess of outstanding liabilities amounting to \$121,584,708, made up as follows: Gold, \$82,462,078; silver, \$12,215,541; legal tenders, \$14,930,633; treasury notes, etc., \$11,976,456. Changes during the week were decreases of \$1,154,117 in the total balance and of \$7,104,710 in the gold. The latter shows the effect of the continued exports of gold.

The Bank of England on Thursday, May 24th, reported its gold holdings at £34,256,974, an increase of £10,189,939, as compared with the corresponding date last year. The Bank is increasing its gold rapidly, having added £1,544,000 during the week. Its unemployed balances are large, the reserve on the date given being 67.24% of liabilities, a proportion higher than has been known for many years.

The Bank of France on Thursday, May 24th, reported its specie holdings, in sterling, at £70,927,164 gold and £51,098,683 silver; an increase of £2,343,007 gold and a decrease of £114,906 silver as compared with the corresponding date in 1893. Changes during the week were increases of £333,000 gold and £182,000 silver.

The large accumulations of gold by all the leading European banks still continue, and are attracting much attention. In England much of this is due to the great production of the yellow metal in South Africa and Australia, most of the output being shipped to London. In Austria-Hungary gold has been amassed in preparation for the reform of the currency; in France, Germany and Russia many have attributed it to the quiet preparations for war in which all those countries are engaged. However this may be, it is a fact that the New York banks have nearly as great a stock. The true state of the case seems to be that the depression of trade has extended over all the commercial world, and that almost everywhere there is a surplus of money looking for investment, the owners of which are willing to keep it idle rather than to run risks. The speculative spirit is quiet for the time and the result is that the banks are loaded with money, for which they would be only too willing to find employment. In ordinary times there would be a demand for the money, but in those like the present its owners are not willing to take the chances of loss which are readily accepted when times are "brisk."

The price of Indian exchange continues to fall, and late quotations are 12½d. and 12¼d. per rupee. The present indications are that the price of the rupee will soon be down to 12d. if not below that figure. The fall in silver in London has not corresponded in amount to that of the rupee, a demand from China and Japan having helped in keeping up the price.

The India Council has borrowed £2,000,000 in London for one year, £1,000,000 of the amount, however, being to replace a maturing loan. The loan was taken at a rate which will make the interest about 1:925% for the year. The object in borrowing seems to have been chiefly to strengthen the Council's position and free it from the necessity of selling bills at any price offered to meet its obligation.

Meantime the accumulation of money in the Indian treasuries continues, and there is much complaint of the scarcity of money there. The discount rates of the Indian banks, which were last week lowered to 7 and 8%, have risen sharply again, and the rate this week has been 9% in Calcutta and 10% in Bombay.

The London "Statist" of recent date says: The interesting feature is reported from India that the high price of gold in the Indian bazars is tempting the natives to sell their trinkets and hoarded gold. There was quite a large business for delivery up to

August at the price of 30 rupees per tola; that is to say, natives who bought gold when the rupee was in the neighborhood of par can now turn their gold into about double the amount of rupees. If these sales of gold should continue, they may have a considerable influence in steadying the exchanges.

Exports of silver from London to the East up to May 10th are reported by Messrs. Pixley & Abell's circular as follows:

	1893.	1894.	Changes.
India	£2,874,989	£2,267,735	D. £607,254
China	171,203	1,231,873	L. 1,113,670
The Straits	801,240	339,600	D. 461,640
Totals.....	£3,847,432	£3,831,208	D. £16,215

Shipments reported for the week were £86,000 to Bombay. The large increase in shipments to China this year is due in considerable part to a great decrease in the exports from India to China, making it necessary to ship silver direct to the latter country in settlement for goods bought.

A curious, but apparently equitable, claim for damages has just been refused in London. When the Indian mints were closed in June last several Eastern banks had afloat shipments of silver bought in London in the expectation that the silver would be coined after arrival in the East. Owing to the sudden and unexpected action of the government these shipments resulted in heavy losses, and the banks, considering themselves unjustly treated, have since claimed compensation from the government. Notice has now been given that these claims, the total amount of which is £38,632, cannot be allowed. It is said that the banks will bring the matter before the House of Commons.

The Board of Trade returns give the imports and exports of the precious metals in Great Britain for the four months to April 30th as follows:

Gold.		Silver.	
1893.	1894.	1893.	1894.
Imports. £1,490,054	£7,499,606	£3,395,070	£4,046,981
Exports. 3,465,911	2,319,125	4,071,432	4,470,748
Excess. I. £1,224,173	I. £5,180,481	E. £676,362	E. £423,764

The large increase in gold imports this year is to be noted. The surplus of gold imports over the exports is somewhat more than four times as great as it was last year.

The total amount of silver coined in the British Mint for the fiscal year ending March 31st last was £1,133,154, money or coinage value.

The London "Economist" says: The coinage of £480,000 of small silver coin, to complete the contingent of £10,560,000 of this token money, fixed for France by the Convention of 1885, has become necessary, as about £3,200,000 of Italian silver are about to be returned to Italy. The Bank of France only holds £2,000,000 of the Italian coin, and the remaining £1,200,000 will be taken from the circulation. But the intention of the Minister of Finance to purchase the silver for the coinage on the market and make a profit of over £240,000 on the operation is criticised. It is estimated that the stock of legal tender pieces of five francs in France is £144,000,000, of which about a third is at the Bank of France, and cannot be put into circulation, as the country is saturated with silver, and the coin, if paid out, returns at once to the bank. The "Debats" maintains that the proper course would be to melt down a sufficient quantity of five-franc pieces, as was done by Belgium on a similar occasion. As those pieces are 900 fine, while the token money is only 835 fine, 2,226,696 five-franc coins of a nominal value of £445,000 would suffice for the £480,000 of small pieces. By buying silver, the stock in the country, already too large, would be increased for the benefit of American mineowners. But the Minister of Finance will probably not abandon the profit of £160,000. No purchases of silver have yet been made, and only £160,000 will be coined this year.

The premium on gold at Buenos Aires has risen to 292 recently, after fluctuating for some time between 275 and 285.

Domestic and Foreign Coins.

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

	Bid.	Asked.
Mexican dollars.....	\$5.11½	\$5.52½
Peruvian soles and Chilean pesos....	.50½	.52½
Victoria sovereigns.....	4.87	4.89
Twenty francs.....	3.88	3.92
Twenty marks.....	1.78	1.82
Spanish 25 pectas.....	4.82	4.98

Other Metals.

Copper.—The decline noticed by us a week ago has been checked by the receipt of larger orders from the consumers, who are now better supplied

with orders for their product than they were, but all complain that the margin of profit has been nearly if not quite wiped out. This does not bode well for the market, as they will have either to get more for their manufactures or become able to lay their raw material in cheaper, the latter being the most likely to occur. Anyhow, they almost all continue to follow their conservative policy of buying only what is needed in the very near future, and as trade in Europe is very quiet, as must be concluded from the fact that even present unprecedentedly low prices do not attract attention and buyers, speculation seems to be the only thing that will bring about higher prices. Of speculation, however, there are no signs in sight. We have to quote Lake copper at 9½@9¾, electrolytic at 9@9½, casting at 8¾@8½, and Arizona pig copper nominally at 8¼@8½.

Abroad there has been an improvement in the speculative market, as represented by G. M. B's, as the week opened with the ruling quotations £38 17s. 6d. @ £39 2s. 6d. for spot and £39 5s. @ £39 10s. for three months, which figures were improved upon from day to day until an advance of about 10s. had been recorded, but the close is a little weaker and lower at £39 5s. @ £39 7s. 6d. for spot and £39 10s. @ £39 12s. 6d. for futures, refined and manufactured sorts being quoted as follows: English Tough, £41 5s. @ £41 1s.; Best Selected, £42 5s. @ £42 10s.; Strong Sheets, £51 @ £51 5s.; India Sheets, £47 10s. @ £47 15s.; Yellow Metal, 4½d.

The exports of copper from the Port of New York during the week ending May 25th, as reported by the New York Metal Exchange, were as follows:

Hamburg—Russia.....	Ingots	15 tons
Havre—La Bretagne.....	Plates	5 "
" " " " " " " "	Bars	12 "
" " " " " " " "	Ingots	15 "
Rotterdam—Rotterdam.....	Plates	20 "
Antwerp—Waesland.....	Ingots	25 "
Liverp—Pauric.....	Ingots	50 "
Swansea—Exeter City.....	Bars	200 "
Liverpool—Cevic.....	Pigs	97 "
Antwerp—Waesland.....	Plates	22 "
Havre—La Bretagne.....	Ingots	55 "
Rotterdam—Maasl and.....	Pigs	25 "
" " " " " " " "	Plates	25 "
Bremer—Aller.....	Pigs	50 "
Liverpool—Campania.....	Bars	30 "
" " " " " " " "	Pigs	54 "

Exports of copper from Baltimore for the week ending May 25th are reported by our special correspondent as follows:

May 14, Hamburg—Remus.....	127 cakes,	45,262 lbs.
" " " " " " " "	3,844 ingots,	56,000 "
" " " " " " " "	7,466 bars,	336,152 "
" 22, Havre—Alvale.....	6,748 ingots,	112,100 "
" " " " " " " "	286 bars,	45,603 "
" " " " " " " "	65 cakes,	17,823 "
" 24, Liverpool—Montezuma.....	2,009 bars,	221,001 "

Other metals exported during the week were: 296 bundles, 41,615 lbs., tin scrap, to Rotterdam.

Tin.—The market here has advanced as the figures cabled from abroad improved, the good demand for metal for immediate consumption continuing. To-day we have to quote 20½ for May June delivery.

In London prices at the opening were a few shillings higher than the close of the preceding week and the advance has been gradual to £71 12s. 6d. @ £71 15s. for spot and £72 @ £72 2s. 6d. for futures, at the close.

Lead.—Lead has been very quiet, but, if anything, the market is easier, and we quote 3'35 @ 3'40, about the same as last week.

Abroad, also, there has been but little change, although what there has been is for the better, as Spanish lead is now quoted at £9 2s. 6d. @ £9 3s. 9d. and English at 2s. 6d. more per ton.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead firmer and fairly active at 3.15c. Some 800 tons have been placed on this basis during the week. Argentiniferous lead is generally held higher and only Missouri brands are apparently obtainable at 3'15.

Spelter is not as firm as it was last week, in fact it is much weaker, as the closing down of the galvanizers, for lack of fuel supplies, and the continued dullness in the brass trade have decreased the demand. We quote 3'40 @ 3'45. Good ordinaries are worth £15 12s. 6d. and specials £15 15s. in London.

Antimony.—Continues dull at 10½c. for Cookson's; 9½c. for L. X.; 8¼ for Hallett's; 10c. for U. S. French Star.

Aluminum.—The Pittsburg Reduction Company furnishes the following quotations: No. 1 (guaranteed over 98% pure) in rolling ingots, 75c. per lb. in small lots; 73c. per lb. in 100-lb. lots; 70c. per lb. in ton lots. No. 1 aluminum in ingots for remelting; 65c. per lb. in small lots; 60c. per lb. in 100-lb. lots; 55c. per lb. in ton lots and over. No. 2 grade (guaranteed to be over 94% pure aluminum, with no injurious impurities, for alloying with iron and steel) cast in ingots for remelting; 60c. per lb. in small lots; 55c. per lb. in 100-lb. lots; 50c. per lb. for ton lots and over. Aluminum castings from 90c. per lb. upward, in accordance with the number of castings, their weight, etc. Sheets are quoted 80c. @ \$4.40 per lb., according to thickness and size. Wire, \$1 @ \$2.50 per lb., according to gauge. Abroad, the Neuhausen Company continues to quote 5 fr. per kilogram for ingots in large lots. The price given is at works in Switzerland.

In Paris 99% pure metal is quoted at 7 fr. per kilo, for ingots; 8 fr. for sheets; 11 fr. for wire; and 19 fr. per kilo, for tubes.

Bismuth.—Quotations on the New York Metal Exchange are \$2 per lb. for lots of 500 lbs. or over; \$2.25 @ \$2.50 per lb. for smaller lots.

Magnesium.—The only concern at present manufacturing this metal in commercial quantities (the Aluminum und Magnesium Fabrik, Hemelingen, Germany), quotes prices as follows: Ingots and cubes, \$6.48 per kilogram; bars, \$6.24; powder, \$3.64, ribbon 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 in this market are steady at 43 @ 50c. per lb., according to grade.

Platinum.—Prices are steady, with no recent changes to report. For chemical ware, 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 quantities named. Current retail price for crucibles is 50c. per gram.

Sodium.—There are no local quotations. In Germany and England the metal is quoted at 90c. @ \$1 per lb. at factory.

Quicksilver.—Quotations are: New York, \$36; London, £6.

CHEMICALS AND MINERALS.

NEW YORK, Friday Evening, May 25.

Heavy Chemicals.—We must continue to report a very dull, heavy chemical market. Caustic soda has been the most active of all, but it is only speaking comparatively to what we can say it has been active at all. There is the usual jobbing demand for it and no more. There has also been a slightly improved spot demand for bleaching powder. Carbonated soda ash and alkali continue very quiet. Prices are unchanged from last week. We quote: Caustic soda, 60%, 2 82½ @ 2 97½c.; 70%, 2 60 @ 2 70c.; 74%, 2 62½ @ 2 72½c.; 76%, 2 70 @ 2 80c. Carbonated soda ash, 48%, 1 05 @ 1 25c.; 58%, 1 05 @ 1 15c. Alkali, 48%, 1 05 @ 1 15c.; 58%, 1 @ 1 10c., according to package. Sal soda, 80 @ 90c. Bleaching powder, 2 05 @ 2 50c.

Acids.—The acid market continues without features and is very dull. There is the usual jobbing demand at unchanged prices. 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; chamber acid, \$7.50 @ \$8 per ton. Mixed acids according to mixture, oxalic, \$6.40 @ \$7.25 per 100 lbs. Blue vitriol is quoted at \$3.75; glycerine for nitro-glycerine, 11½ @ 12½c., according to quality and quantity.

Brimstone.—There is nothing of interest to report of the brimstone market. It continues very dull. Quotations are as follows: Best unmixd seconds, on the spot, \$16.75; shipments, \$16.25. Best thirds are \$1 less.

Fertilizing Chemicals.—The fertilizer market is dull, but steady. There is but little demand, the usual dullness subsequent to the close of the spring season having set in. Prices show but little change. We quote sulphate of ammonia \$3.55 for gas liquor and \$3.25 for bone. Dried blood, \$2.35 per unit for high grade and \$2.20 for low grade. Azotine, \$2.35. Concentrated phosphate (60% available phosphoric acid), 75c. per unit. Acid phosphate, 13% to 15% av. P₂O₅, 60c. per unit at seller's works in bulk. Dissolved boneblack, 17% to 18% P₂O₅, 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, \$22.50 @ \$23; low grade, \$21 @ \$21.50. 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 17% available, \$6.50 @ \$7 cash in bulk. High grade phosphate rock is \$4.75 @ \$5 f. o. b. vessel and cars at mines. Land phosphate rock \$4.75 f. o. b. cars or vessels at mines.

Muriate of Potash.—Arrivals this week aggregate 250 tons. In lots of 50 tons, quotations are as follows: 80-85% and minimum 80% 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 sylvinite, 27-35%, prices are as follows per cent. per gross ton, invoice weight: New York, Boston and Philadelphia, 37½c.; Charleston, Savannah, Wilmington, N. C., and New Orleans, 41c. Actual weight, i. e. more per cent.

Nitrate of Soda.—The market is quiet but strong. We quote this week: On the spot, \$2.25@2.27½; near-by, \$2.07½@2.15, according to position; summer shipments, \$2.

Liverpool.

May 16.

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

As usual at Whitsuntide, works are closed down for repairs as regards the Lancashire district, and owing to the depression in trade the stoppage is expected to last longer in consequence. There is little business passing, while quotations show no material change. Soda ash is unaltered, prices for Leblanc makes being nominally quoted as follows: Caustic ash, 48%, £3 15s. @ £4 per ton; 57% and 58%, £4 10s. @ £4 15s. per ton. Carbonate ash, 48%, £3 5s. @ £3 15s. per ton; 58%, £3 15s. @ £4 per ton, net cash.

Ammonia ash, 58%.—The low prices continue to rule, £3 10s. @ £3 15s. per ton, net cash, being quoted for tierces and 5s. less for bags. Soda crystals are easy at £2 13s. 9d. @ £2 15s. per ton, less 5%. Caustic soda is in a lifeless state, and quotations vary according to export market, the nearest spot range being about as follows: 60%, £7 10s. @ £8 5s. per ton; 70%, £8 10s. @ £9 5s. per ton; 74%, £9 10s. @ £10 5s. per ton; 76%, £10 10s. @ £11 5s. per ton, net cash. For parcels under 10 tons 5s. per ton extra is charged.

Bleaching powder is firm, quotations for hardwood packages ranging from £7 10s. to £8 5s. per ton net cash, while there is nothing offering at present on this market available for export to the States. Chlorate of potash is nominally quoted by resellers at 6½@7d., but market is quite idle as there is practically no export demand.

Bicarb. soda is in fair request, and steady at £6 15s. per ton, less 2½% for one cwt. kegs, with usual allowances for larger packages. Sulphate of ammonia is in a somewhat peculiar position this week, as the "bulls" have attempted to corner the market and have put prices up nominally to £13 16s. 3d. @ £14 1s. 3d. per ton, less 2½% for good gray 24 and 25% in double bags f. o. b. here. It seems purely artificial, however, as there is really nothing in the demand to warrant the advance. Nitrate of soda is a shade prime at £10 5s. 6d. per ton less 2½% for double bags f. o. b. here. Carb. Ammonia, Lump, 3¼d. per lb.; powdered, 4d. per lb. less 2½%.

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 502 and 504.]

NEW YORK, Friday Evening, May 25.

Strange as it may seem to those persons who have carefully followed the course of the mining stock market during the past year, we have no hesitation in saying that the past week has been one of the dull-est on record. The features of the market have all been negative; no activity, no sales of any significance, no interest taken by the public and, as one epigrammatic broker expressed it, "no nothin'."

The Comstocks were neglected this week. Consolidated California & Virginia shows only one sale of 25 shares at \$6. The only other Comstock stock to be traded in was Comstock Tunnel, of which 29,000 shares were sold at 7c. @ 8c.

Standard Consolidated was in fair demand; 400 shares changed hands at \$1.70@1.75. No other California stock shows any sales.

There was a single transaction of 100 shares of Eureka Consolidated at 30c.

Of the Colorado stocks, Leadville Consolidated was the most active, 1,200 shares being sold at 9c. Other sales were: 100 shares of Little Chief at 13c., 100 shares of American Flag at 3c., and 100 shares of Lacrosse at 4c.

NOTES OF THE WEEK.

The Dayton, Nev., "Times" says that the Comstock Tunnel Company has been attached for something like \$9,000. The claim is that of a couple of San Francisco lawyers, for fees.

The general manager of the Brunswick Consolidated Gold Mining Company writes as follows from Grass Valley, Cal., under date of May 19th: I find the mine in a much better condition than I expected. The mine is looking well, and judging from the amount of ore in sight, we will be able to keep the five stamps that we started up on the 15th inst. running for some time to come. We will let a contract to sink the shaft 100 ft. We are now preparing the bottom of the shaft for the contractors to examine, and also putting in a tank.

President Ezekiel, of the Denver Mining Exchange, states that the listing committee will go

over all the stocks now listed on the exchange and weed out the wildcats. The committee on mining securities at the Consolidated Stock and Petroleum Exchange would do well to follow the example set by their Western colleagues.

The latest official weekly letter from the Bulwer Consolidated Mining Company, of Bodie, Cal., says: The upraise from south drift 7 has been extended 19 ft. We are still getting some good ore from a seam south of No. 2, 200 level, and some fair-grade ore from back of upraise 6, above the 200 level. It shows some improvement. Will commence to crush Bulwer ore in Standard mill in a few days.

The Colorado Springs Mining Stock Association has been organized and incorporated under the laws of the State of Colorado. The membership of the association is associate and exchange, the former being men who are interested in mining property and the latter comprising those to whom alone the privileges of the floor are confined. Initiation fee for both these members is \$20, and the price of a seat to those admitted as exchange members is \$180. Non-resident associate membership has also been provided for, annual dues of which have been fixed at \$10.

Boston.

May 24.

(From our Special Correspondent.)

The market for copper stocks the past week has shown a good deal of weakness, with apparently very little support on the bull side of the list. The Montana stocks opened quite firm and sold a fraction higher in the early dealings, but later on they weakened in sympathy with the rest of the market. Boston & Montana sold at \$26½, declined to \$24½, and recovered to \$25½. Butte & Boston advanced to \$9½ on the report that a dividend was among the possibilities of the near future. Later the stock declined to \$9, and closed at \$9½.

Calumet & Hecla declined from \$275 to \$270, with very little desire to purchase it at these figures. Tamarack sold, ex dividend, this week at \$160, declined to \$158½ and recovered the decline. Quincy declined from \$92 to \$81, and would probably go lower if much stock was pressed for sale. The scrip is in fairly good demand at \$30, at which price all the sales were made. Osceola still continues to decline on free offerings of stock, and touched \$20½, the lowest price since July, 1893. The later sales were at \$21. Franklin touched \$7½, the lowest price for many years, recovering to \$8. Atlantic sold at \$8, and a small lot brought \$7 only. Kearsarge sold at \$6, the same as last week. Wolverine declined from \$1½ to \$1¼ and freely offered at that. Allouez sold at 10c. Centennial had a sharp break from \$2½ to 75c. on the circular issued by the company appealing to stockholders to furnish money to pay its debts due next month, or otherwise work will cease; since May 1st the developments on the Osceola lode have proved disappointing.

The market closed dull and featureless.

San Francisco.

May 18.

(From our Special Correspondent.)

The fluctuations in prices in the mining stock market have not been very wide during the week, but the volume of trade has declined. To-day prices have been steady with a rather light demand. The week opened with prices ruling less than the prevailing rates of last week, and Consolidated California & Virginia has not, so far, recovered its full strength. This morning it opened at \$5.50, and advanced during the day to \$6.25. The highest price ruling last week was on Thursday when the stock sold for \$8. The latest advices from the mine are to the effect that the south drift, 23 ft. below the 1,650 level, still continues in bunches of high grade ore. The time specified in the contract made by Jim Rule with the directors of the Consolidated California & Virginia company is drawing to an end without the promised ore development. The report is abroad that Mr. Rule has been granted a two-weeks extension of time, during which a supreme effort will be made to discover what to date has been undiscoverable. Ophir has sold in the open market for \$3.70, a decline of \$1.20 during the week; Mexican for \$1.90, a decline of 45c.; Sierra Nevada for \$1.20, a decline of 35c.; and Union for 95c., a decline of 35c.

The Middle Comstocks to-day were in fair demand, prices being as usual regulated by the North Enders. Best & Belcher ruled at \$1.80; Chollar at 70c.; Gould & Curry at \$1; Hale & Norcross at 76c.; Potosi at \$1.25, and Savage at 80c.

Of the Gold Hill stocks the favorites have been in demand, but the general list has been largely neglected. Belcher sold to-day for \$1.50; Confidence for \$1.65; Overman for 30c., and Yellow Jacket for 85c.

During the afternoon after the regular session prices declined somewhat, until the close sales were made at from 5c. to 10c. off ruling rates.

BY TELEGRAPH.

SAN FRANCISCO, May 25.—The opening quotations to-day are as follows: Best & Belcher, \$1.55; Bodie,

\$1.45; Belle Isle, 10c.; Bulwer, 12c.; Chollar, 60c.; Consolidated California & Virginia, \$5.85; Eureka Consolidated, 50c.; Gould & Curry, 90c.; Hale & Norcross, 65c.; Mexican, \$1.65; Mono, 25c.; Navajo, 10c.; Ophir, \$3.60; Savage, 68c.; Sierra Nevada, \$1.10; Union Consolidated, 85c.; Yellow Jacket, 79c.

Paris.

May 16.

(From our Special Correspondent.)

In the mining share market this week perhaps the most marked feature has been the continued fall of Nickel shares, which have gone down to 415 fr., with the prospect of a further fall on heavy sales. No one can assign any special cause for the decline, except that some heavy holders have thrown a large block on the market, and a general uneasy feeling has resulted. The copper shares have been unsteady, but in general have held their ground moderately. Rio Tintos have been supported by the approaching dividend, but Tharsis, Cape Copper and Jerez-Lanteira have fallen a little under heavy sales.

Huanchaca has been steady with no change, and good reports from the mine are talked of, to offset the declining price of silver. The Transvaal gold stocks have held their prices well, but there have been few dealings. De Beers Consolidated has advanced somewhat on the statement that the debentures are to be refunded, effecting a saving of 500,000 fr. yearly in the interest account.

The zinc and lead stocks have been weak, with the exception of Laurium, which is held up by reports of good dividend shortly; and Aguilas, which is strong on reports of new developments of value in the mines.

Coal stocks have been rather dull, but are firm. Mokta-el-Hadid and Dombrowa have been dealt in.

The steel and iron (construction) stocks have been steady, with prices well supported, but without heavy dealings. The whole market, indeed, has been dull, and every one seems to fear speculation beyond narrow limits.

The report of the Credit Foncier for 1893 shows that the total amount of public and private loans made during the year was 206,432,602 fr., a decrease of about 4% from 1892. The net profits of the year, after deducting all expenses of conducting the business, were 17,520,473 fr., a decrease of nearly 4%. From these profits 1,423,055 fr. were carried to reserve account, 15,345,000 fr. (45 fr. per share) paid in dividends, and a balance of 752,418 fr. carried forward on current account. The year was only a fairly successful one.

The report read at the annual meeting of the Banque de Paris, the chief business of which is with foreign governments, refers to some of the operations in which it has been engaged. In 1891 the bank advanced for two years a sum of 20,000,000 fr. to the Province of Quebec on Treasury bonds, which it placed among its clients. The period having expired, and the Provincial Government not considering the moment favorable for the issue of a loan as intended, the Banque de Paris consented to renew the loan of 4%. An advance of 50,000,000 fr. made to the Spanish Government in 1892, in view of a more important financial operation, was reimbursed, the expected loan of which it was to have been the prelude not having been concluded. In the arrangement with the Argentine Government, bondholders of the 5% loan of 1896, which is held principally in France, obtained more favorable conditions than for other Argentine loans. The bank participated in the issue of the Salonica-Constantinople Railway bonds, and in the conversion of the Russian loan of 1883, but the operations of the year were less important than usual, and the dividend of 6% was made up by an appropriation from the reserved profits put by last year.

Our market is somewhat unsteady generally, owing to disturbing political rumors and discussions. The growing amount of the railroad subventions, as shown by the fiscal statements of the government, makes us some uneasiness for the future. AZOTE.

DIVIDENDS.

National Lead Company, dividend (tenth quarterly) of 1¼% on the preferred stock, payable June 15th, to stockholders of record on May 25th; also dividend of 1% on the common stock, payable July 2d, to stockholders of record on June 11th.

MEETINGS.

Pennsylvania Coal Company, annual meeting, at the office at Dunmore, Pa., June 5th. The polls will be open from 11 a. m. to 12 noon. The transfer books will be closed from May 28th to June 7th inclusive.

Rossie Iron Works, annual meeting, at the office, Room 84, Drexel Building, New York, June 6th, at 12 noon. Transfer books close May 26th.

Silver Hill Mining Company, annual meeting, at the office, No. 79 Nevada Block, San Francisco, May 28th, at 3 p. m.

Valenzuela Consolidated Land and Mining Company, annual meeting, at the office, No. 431 California Street, San Francisco, June 1st, at 1 p. m.

NEW YORK MINING STOCK QUOTATIONS. DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, May 19, May 21, May 22, May 23, May 24, May 25, SALES. Lists various mining companies like Belcher, Nevada, and Comstock T. bonds.

NON-DIVIDEND-PAYING MINES.

Table with columns: NAME AND LOCATION OF COMPANY, May 19, May 21, May 22, May 23, May 24, May 25, SALES. Lists various mining companies like Am. Flag, Alpha, and Barcelona.

*Ex-dividend. †Dealt in at New York Stock Ex. Unlisted securities. \$Assessment paid. †Assessment unpaid. Dividend shares sold 1,825. Non-dividend shares sold, 4,100. Total shares sold, 5,925.

BOSTON MINING STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, May 18, May 19, May 21, May 22, May 23, May 24, SALES. Lists companies like Atlantic, Breese, and Bonanza Development.

Table with columns: NAME OF COMPANY, May 18, May 19, May 21, May 22, May 23, May 24, SALES. Lists companies like Allouez, Arnold, and Astec.

Dividend shares sold, 3,536. Non-dividend shares sold, 3,276. Total shares sold, 6,862.

COAL AND COAL RAILROAD STOCKS.

Table with columns: NAMES OF STOCKS, May 19, May 21, May 22, May 23, May 24, May 25, Sales. Lists various coal and railroad stocks like Am. Coal, Balt. & Ohio, and Ches. & Ohio.

Total shares sold, 86,842.

INDUSTRIAL AND TRUST STOCKS.

Table with columns: NAME OF STOCKS, May 19, May 21, May 22, May 23, May 24, May 25, SALES. Lists various industrial and trust stocks like Adams Express, Am. Cotton Oil, and Am. Dist. Tel.

Total shares sold, 653,948.

PENNSYLVANIA.

Table with columns: Philadelphia, May 24. Bid, Asked. Lists companies like Cambria, Edison E. Light Co., and Northern Liberties Gas.

UTAH.

Table with columns: Salt Lake City. Bid, Asked. Lists companies like Alliance, Anchor, and Centennial Eureka.

FOREIGN.

Table with columns: London Quotations, May 17, 1894. Buyer, Seller. Lists companies like Alaska Treadwell, Almada & Tiritto, and American Belle.

CALIFORNIA.

Table with columns: San Francisco. Closing Quotations. Lists companies like Alpha, Alta, and Belcher.

COLORADO.

Table with columns: Denver. Prices and sales for six days ending May 21st, 1894. Lists companies like Alamo, Aola, and Argonum.

MARYLAND.

Table with columns: Baltimore, May 23. Bid, Asked. Lists companies like Atlantic Coal, Balt. & N. C., and Conrad Hill.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares, Par, Dividends (Total Levied, Date and amount of last, Total paid, Date & amount of last), Name and Location of Company, Capital Stock, Shares, Par, Assessments (Total levied, Date and amount of last, Total paid, Date & amount of last).

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, 1893, the California had paid \$31,250,000 in dividends, and the Cons. Virginia \$12,500,000. § Previous to the consolidation of the Copper Queen with the Atlanta August, 1893, the Copper Queen had paid \$1,500,000 in dividends. ¶ Previous to this company's acquiring Northern Belle, that mine paid \$4,000,000 in dividends against \$425,000 in assessments.

COLORADO. Aspen. May 17. Price. Argentinum-Juniata \$0.52, Aspen Contact .38, Aspen Deep Mining .04 1/2, Best Friend .06, Bi-Metallic .05, Bushwacker .11, Della S. .85, Gold Valley Placer .11 1/2, Little Annie .04 1/2, Mollie Gibson .1 27/32, Pontiac .04, Smuggler .04 1/2, St. Joe & Mineral Farm .04 1/2, U. S. Paymaster .04 1/2.

Colorado Springs. Prices and sales for the week ending May 19th, 1894. High. Low. Sales. Cripple Creek (gold): Aols. .02 1/4 .02 1/2 29,000, Alamo .01 1/4 .01 1/2 .1,500, Anacosta Gold .27 1/2 .28 1/2 .1,500, Anchorta Leland .01 .01 .01, Antlers-Park Regt. Bankers .05 1/4 .06 .01, Blue Bell .02 .02 1/4 .01, Calumet .01 .01 .01, Columbine .01 .01 .01, Cripple Creek Con. .02 1/2 .03 3,500, Creede & Cripple C. .01 1/4 .01 1/2 .01, Elkton .62 1/4 .63 .01, Fannie Rawlings (S. & G.) Leadville .05 1/4 .07 6,500, Gold King .3.10 4.10 .01, Goldstone .01 .01 .01, Gould .07 1/4 .07 1/4 8,000, Golden Eagle .01 .01 .01, Gold Standard .01 .01 .01, Granite Hill .01 .01 .01, Isabella .17 .17 1/2 .01, Jack Pot .02 1/4 .02 1/4 .01, Lottie Gibson .01 1/2 .01 1/2 .01, Mollie Gibson .01 1/2 .01 1/2 .01, Mt. Rosa .06 1/4 .07 2,300, Mutual .01 .01 .01, Ophir .04 1/4 .05 .01, Pharmacian .09 1/4 .10 .01, Sacramento .01 .01 .01, Union .25 1/4 .26 1,400, Virginia M. .03 .03 1/4 .01, Work .03 1/4 .04 .01, World .02 .02 1/2 21,000.

PENNSYLVANIA. Pittsburgh. May 21. Bid. Asked. Allegheny County Light .80 .80, Bridgewater Gas .48 .48, Chartiers Valley Gas .12 1/2 .12 1/2, Manufacturers' Gas .33 .33, Nat. Gas Co. of W. Va. .25 .25, Olive Valley Gas .23 .23, People's Nat. Gas .25 .25, People's Pipeage Co. .14 1/4 .14 1/4, Penn. Gas .10 .10, Philadelphia Co. .19 1/4 .19 1/4, Pittsburgh Gas Co. .77 .80, Wheeling Gas .18 1/4 .19 1/4, Fisher Oil .10 .10, Hazewood Oil Co. .7 .15, Tuna Oil .7 .15, Chartiers Block Coal .35 .35, N. Y. & Cleve. Gas Coal .48 1/4 .48 1/4, Monongahela Nav. Co. .67 1/2 .67 1/2, Monongahela Water .30 .30 1/2, Luster Mining Co. .9 1/4 .13, Pittsb. Plate Glass Co. .125 .145, Stand. Undergr. Cable Co. .93 1/4 .94 1/2, U. S. Glass Co., pref. .91 1/2 .92 1/2, common .26 .26, Westinghouse Air Brake .122 .123 1/2, Westing'g's Elect. .51 1/4 .52 1/4, " " 2d .37 .38, " " com .23 1/4 .23 1/4.

MISSOURI. St. Louis. May 21. Closing quotations: Bid. Asked. Adams .50 .50, American & Nettie, Colo. .25 .30, Bi-Metallic, Mont. .2.40 3.00, Elizabeth, Mont. .15 .20, Granite Mountain, Mont. .1.25 1.75, Hope .2.50 .2.50, Leo .01 1/4 .02, Small Hopes .01 .50.

MONTANA. Helena. (Specially Reported by S. K. Davis.) Stock quotations week ending May 18. Bid. Asked. Bald Butte (Mont.) .51 .50, Benton Group (Neilhart), Mont. .25 .25, Combination (Phillips'g), Mont. .90 .90, Helena & Frisco .1.25 .1.25, Helena & Victor, Mont. .25 .25, Iron Mountain (Missoula), Mont. .40 .50, Piegan (Marysville), Mont. .40 .50, Poorman (Coeur d'Alene), Idaho .90 .90, Whitlach Union & MacIntyre .25 .25.

MINNESOTA. Duluth. May 22. LISTED STOCKS. Par. Bid. Asked. Biwabik M. Iron Co. .100 .20 .20, Cincinnati Iron Co. .25 .25 .30, Clark Iron Co. .100 .60 .60, Great Northern Min. Co. .100 2.75 3.50, Kanawha Iron Co. .100 .10 .20, Keystone Iron Co. .100 .40 .40, Lake Superior Iron Co. .25 .2.50 .2.50, Lincoln Iron Co. .100 .60 .60, Mesaba Moun. Iron Co. .100 14.00 17.01, Minneapolis Iron Co. .100 .02 .15, Mountain Iron Co. .100 50.00 65.00, Shaw Iron Co. .100 1.60 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 .40, Buckeye Iron Co. .100 .2.50 .2.50, Buffalo Land & Exp. Co. 1 .50 .50, Chandler Iron Co. .25 20.00 26.00, 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 .00 1/2 .02, Internat'l Development .10 .32.50 .32.50, Jackson Iron Co. .25 .60 .60, Lake Supr. (Marquette) .25 20.00 27.00, McCaskill Mining Co. .10 .01 .03, Mesaba C. L. & Ex. Co. .10 1.75 2.00, Mesaba Chief Iron Co. .100 .30 .20, Mesaba Iron Co. .25 50.00 70.00, Metropolitan L. & L. Co. .25 .25 .25, Northern Light Iron Co. .100 .25 .25, Ohio Mining Co. .100 5.00 8.00, Ophir, gold .10 .1.00 .1.00, Penn. Iron & Steel Co. .100 .04 .10, Pioneer Iron Co. .25 .1.00 .1.00, Pittsburgh & Lake A. Co. .100 110.00 125.00, Putnam Iron Co. .100 .80 .80.

FOREIGN. Shanghai, China. April 20, 1894. (Special Report by J. H. Bisset & Co.) Taels. Sheridan Con. Colo. .2.50, Punyom Mining, Ltd. .5.29, Pref. .1.46, Jelebu Mg. & Trading, Ltd. .4.38, Raub A'lian G. Mg., Ltd. .3.72.

Paris, France. May 11. France. Acieries de France .800.00, " de la Marine .930.00, " de St. Etienne .1,235.63.

Agua Tenidas .534.00, Anzin (coal) .4,422.50, Helmes, Spain .685.00, Callao .24.50, Callas Bis .1,177.50, Carmaux .32.50, Champ d'Or .428.25, De Beers Consolidated .800.00, Dombrowa .1,500.00, Firmeny .130.00, Golden River, Cal. .30.00, " parts .127.50, Huanchaca .15.00, Jerez-Lanaira .8.75, " parts .8.75, Kebao .660.00, Laurium, Greece .555.53, Lexington, Mont .41.50, " parts .0.90, Malfidano .1,560.00, Mokta-el-Hadid .785.00, Nickel-New Caledonia .415.00, Ouro Preto .412.50, Phosphates de France .40.00, Placers Haute Italie .245.00, Pontgibaud .371.25, Rio Tinto, Spain .507.50, " oblig .195.00, Soufres Romaines .113.75, Tharsus, Spain .17.50, Transvaal Coal .24.00, Uruguay .20.00, " rights .457.00, Vieille-Montagne, Belgium .457.00.

ASSESSMENTS. COMPANY. No. Dlnqt. Day of Amt. in office. sale. per share. B. & Belch, Nev. 56 June 5 June 26 .25, Challenge, Nev. 16 May 8 May 29 .05, Clint. Con. Cal. 4 May 14 June 2 .50, Cr'wn Pt., Nev. 61 May 28 June 18 .25, Ea. Sierre, Nev. 3 May 18 June 8 .05, Kelpise, Nev. 8 May June 2 .03, Exchequer, Cal. 37 June 14 July 2 .10, Golden Fr., Nev. 6 May 26 June 23 .25, Gray Eagle, Cal. 38 May 29 June 19 .03, Hale & Norcross, Nev. 105 June 5 June 23 .26, Kent'k C., Nev. 9 June 11 July 3 .10, Magnet, Mont. 4 May 5 June 2 .01, Ophir, Nev. 62 June 6 June 26 .25, Osborn Hill, Cal. 2 May 7 May 28 .25, Pine Hill, Cal. 4 May 19 June 9 .05, Silv. K'g, Ariz. 10 June 11 July 9 .20, West. Con. Cal. & Va., Nev. 2 May 12 May 31 .25.

CURRENT PRICES. These quotations are for wholesale lots in New York unless otherwise specified. Acid-Acetic, chem. pure .17@.19, Commercial, in bbls. and obys. .01 1/4 @.02, Carbonic, liquefied, # lb. .18@.25, Chromic, chem. pure, # lb. 1.00, for batteries .40, Hydrobromic, dilute, U. S. P. .25@.30, Hydrocyanic, U. S. P. .45@.50, Hydrofluoric .20@.30, Alcohol-95%, # gal. \$2.30@2.40, Absolute .83.80, Ammoniated .82.80, Alum-Lump, # cwt. \$1.75@1.85, Ground, # cwt. \$1.85@1.90, Powdered, # lb. .04 1/4 @.05, Lump # ton, Liverpool .45, Alumina Chloride-Pure, # lb. \$1.25, Amalgamating solution, # lb. .60, Sulphate, # cwt. \$1.90@2.50, Ammonia-swt., in bbl. lots, # lb. .07 1/2 @.08, Carbonate, # lb., English and German, # lb. .07 1/4 @.08, Muriate, white, in bbls., # lb. .06 1/4, Aqua Ammonia-(in clys) 3° # lb. .03 @.04, 20° # lb. .04 @.05, 26° # lb. .04 1/2 @.05, Antimony-Oxymur, # lb. .04 @.06, Regulus, # lb. .10@.11 1/2, Argois-Red, powdered, # lb. .15, Arsenic-White, powdered # lb. .03 @.03 1/2, Red # lb. .06 @.07, Yellow # lb. .12 @.13, White at Plymouth, # ton. \$12 @.13, Asbestos-Canadian, # ton. \$10 @.11, Italian, # ton, c. l. f. L'pool. \$18 @.19, Ashes-Pot, 1st sorts, # lb. .47 @.48, Pearl .05 1/2 @.06 1/4, 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 @.07 1/4, Californian, at mine, # ton. \$12.00 @.13.00, at San Francisco, # ton. \$15.00 @.16.00, 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. .06 1/4 @.07, Sulph. Am. prime white, # ton \$17.50 @.19, Sulph. foreign, floated, # ton. \$21 @.24, Sulph. of color, # ton. \$11.50 @.15.00, Carb. lump, L. o. b. L'pool, # ton. \$8, No. 1 Casks, Runoorn, " " \$3 10 0, No. 2 bags, Runoorn, " " \$3 10 0, Hauzite # ton. \$10.00, Bichromate of Potash-Scotch, # lb. .11 @.12, American, # lb. .11 @.12, Bichromate of Soda # lb. .09 1/4 @.10, Borax-Refined, # lb., in car lots, .09, San Francisco .07 1/2 @.08, Concentrated, in car lots .07 1/2 @.08, Refined, Liverpool # ton. .62, Bromine # lb. .25 @.35, Cadmium-Refined # lb. \$1.00.

Cadmium Iodide # lb. \$5.50, Chalk # ton. \$1.50 @.22.25, Precipitated, # lb. .04 @.06, China Clay-English, # ton. \$13 @.18.00, Domestic, # ton. \$9 @.11, Chlorine Water # lb. .10 @.11, Chrome Yellow # lb. .10 @.25, Chrome Iron Ore # ton, San Francisco .50.00, Chromalum-Pure, # lb. .35 @.40, Commercial, # lb. .02 1/4, Cobalt-Oxide, # lb. \$1.90 @.21.70, Copper-Sulph. English Wika, # ton \$20 @.21, Vitriol (blue), ordinary, # lb. .03 1/4 @.03 1/2, extra .04 1/4, Nitrate, # lb. .40, Copperas-Comm'n, # 100 lbs. .85 @.95, Best, # 100 lbs. \$1.35 @.1.50, Liverpool, # ton, in casks .23 @.22 1/2, Corundum-Powdered, # lb. .04 1/4 @.09, Flour, # lb. .03, Cryolite-Pow., # lb., bbl. lots .07 @.08, Emery-Grain, # lb. (w kg.) .01 1/4 @.05, Flour, # lb. .02 1/4 @.04, Epsom Salt # lb. .01 @.01 1/4, Feldspar-Ground, # ton. \$6.00 @.10.00, Crude .22.00 @.33.00, Fluorspar-Powder, No. 1, # ton \$20 @.30, Lump, at mine .16 @.33, French Chalk-Fuller's Earth-Lump, # ton. \$16 @.20, Glauber's Salt-in bbls., # lb. .01 @.01 1/4, Glass-Ground, # lb. .09 @.10, Gold-Chloride, pure, crystals, # oz. \$12.00, pure, 15 gr., c. v., # doz. \$5.40, liquid, 15 gr., g. \$5.50, Chloride and sodium, # oz. \$6.00, 15 gr., c. v., # doz. \$2.75, Oxide, # oz. \$2.25, Gypsum-Calcined, # bbl. \$1.25 @.1.50, Land Plaster .30 @.33, Iodine-Resublimed, # oz. .30 @.33, Iridium-Oxide # lb. .80, Iron-Nitrate, 40°, # lb. .01 @.01 1/4, 47°, # lb. .02 @.02 1/4, Kaolin-See China Clay, Kieserite # ton. \$9 @.10, Lead-Red, American, # lb. .06 1/4 @.07 1/4, White, American, in oil, # lb. .06 1/4 @.07 1/4, White, English, # lb., in oil .06 1/4 @.07 1/4, Acetate, or sugar of, white .06 @.06 1/4, Granulated .09 @.12, Lime Acetate-Am. Brown .90 @.95, Powdered # lb. Gray \$1.75 @.1.87 1/2, English flake, # lb. .05 1/4 @.07 1/4, Magnesite-Crude, # ton c. l. 0.15, kilos. \$14.75, Calcined, # ton of 2,240 lbs. \$22.00, Brick, # ton of 2,240 lbs. \$47.50, Manganese-Ore, per unit. .23 @.33, oxide, ground, # lb. .02 1/4 @.02 1/2, Mercuric Chloride-(Corrosive Sodium etc) # lb. .62 @.64, Powdered # lb. .5, Merbic Dust # bbl. \$1.25 @.1.50, Metallic Paint-Brown # ton. \$20 @.25, Red # ton. \$20 @.25, Mica-In sheets according to size, 1st quality, # lb. .25 @.35.00.

Mineral Wool-Ordinary slag. .01 1/4, Ordinary rock .02 1/4, Ground, # ton .02 1/4, Naphtha-Black .01 1/4 @.01 1/2, Nitre Cake # ton. \$10.00, Ochre-Rochelle, # lb. .01 1/4 @.01 1/2, Washed Nat Ox'rd, Lump, # lb. .03 1/4 @.03 1/4, Washed Nat Ox'rd, Powder, # lb. .07 1/4 @.07 1/4, Golden, # lb. .03 @.05, Domestic, # ton. \$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. .07 1/4 @.13, Phosphorus # lb. .54 @.55, Precip., red, # lb. .80 @.85, white, # lb. .85 @.90, Platine Chloride-Dry, # oz. \$7, Lumpago-Ceylon, # lb. .04 @.05, American, # lb. .05 @.07, Potassium-Cyanide, # lb., C. P. .52, 67%, # lb. .40, mining .28 @.30, Bromide, domestic, # lb. .28 @.32, Chlorate, English, # lb. .18 @.18 1/4, Chlorate, powdered, English, # lb. .18 1/4 @.19, Carbonate, # lb., by casks, 32% .04 @.05, Caustic, # lb., pure slick .05 1/4 @.06, Iodide, # lb. \$2.58 @.2.80, Nitrate, refined, # lb. .06 @.08, Bichromate, # lb. .10 @.11 1/4, Yellow Prussiate, # lb. .21 1/4 @.22 1/4, Red Prussiate, # lb. .39 @.45, Pumice Stone-Select lumps, # lb. \$15, Original cks., # lb. .01 1/4 @.02, Powdered, pure, # lb. .01 1/4 @.01 1/4, Pyrites-Non-cupreous, p. units. 10 @.11, Quartz-Ground, # ton. \$6.00 @.10.00, Kotten Stone, Powdered, # lb. .03 1/4 @.03 1/4, Lump # lb. .06 @.07, Original cks., # lb. .04 1/4 @.05 1/4, Rubbing stone, # lb. .03 1/4 @.04, Sal Ammoniac-lump, in bbls., # lb. .80 1/4, Salt-Liverpool, ground, # sack .700, Domestic, fine, # ton. \$7 @.7.5, Common, fine, # ton. \$4.50 @.5, Turk's Island, # bush .28 @.28, Salt Cake # ton. \$10.00 @.15.00, Saltpeter-Crude, # lb. .03 1/4 @.04, Soapstone-Ground, # ton. \$8 @.8, Block and slab according to size, Sodium-Prussiate, # lb. .22 @.24, Phosphate, # lb. .04 @.05, Stannate, # lb. .06 @.12, Tungstate, # lb., c. v., in casks \$1.70 @.1.80, Hypophosphite, # lb. \$1.70 @.1.80, Strontium-Nitrate, # lb. .08 1/4 @.09, Sulphur-Roll, # lb. .01 1/4 @.02 1/4, Flour, # lb. .01 1/4 @.02, Sylvinit, 27 3/4%, S.O.F., per unit. 3.75, Tale-Ground French, # lb. .01 1/4 @.01 1/4, American No. 1, # lb. .01 1/4 @.01 1/4, American No. 2 .06, Terra Alba-French, # lb. .65 @.80, English, # lb. .65 @.80, American, No. 1, # lb. .65 @.80, American, No. 2, # lb. .65 @.80.

Tin-Crystals, in kegs or bbls. 14 @.15, feathered or flossed .20, Muriate, single .07 @.13, Double or strong, 64° B. .10 @.15, Oxymur, or nitro .19, Vermilion-Imp. English, # lb. .80, Am. quicksilver, bulk .67 @.69, Am. quicksilver, bags .58 @.60, Chinese .85 @.91.00, Trieste .90 @.96, American .11 1/4 @.13, Zinc White-Am., Dry, # lb. .04 1/4 @.08, Antwerp, Red Seal, # lb. .06 1/4 @.07, Paris, Red Seal, # lb. .07 1/4 @.08, Muriate solution .06, Sulphate crystals, in bbls., # lb. .03 @.03 1/4, 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 amalgam) .7.75, Bismuth (metallic), per kilo. 6.25, Cadmium (metallic) .2.75, Calcium (per electrol.) .5.25, Cerium (pulv.) .2.25, (fusum in globulis) .5.6, Chromium (fus.) .40, (cryst.) .75, Cobalt (metallic), per kilo .10.0, (pure), per kilo .40.00, Didymium (pulv.) .5.5, 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.) .12 1/2, Niobium (pulv.) .4.25, Osmium .1.00, Palladium (wire) .06, (pulv.) .1.00, Potassium (metal), per kilo .27.50, Rhenium .1.63, Strontium .2.50, Rubidium .6.25, Selenium (cryst.) .5, (precipitates) .62 1/4, Strontium (per electrol.) .7.25, (ex amalgam) .3.25, Tantalum .4.75, Tellurium (fusum) .50, (precipitates) .22 1/2, Thallium .03 1/4, Titanium .1.1, Tungsten (pure) .01, Uranium .1.01, Vanadium .4.00.

CLASSIFIED LIST OF ADVERTISERS.

Adders and Calculators
Smith, E. C.

Air Compressors and Rock Drills
Boswell, Louis F.
Bullock, M. C., Mfg. Co.
Burlingame, Rock Drill Co.
Clayton Air Compressor Works.
Hasenahl, W.
Ingersoll Sergeant Rock Drill Co.
McKiernan, S. G. & Co.
Norwalk Iron Works Co.
Penn Diamond Drill & Mfg. Co.
Rand Drill Co. (See Diamond Drills.)

Amalgamators
Bucyrus Steam Shovel & Dredge Co.
Gates Iron Works.

Anti-Friction Metals
Hertz, T. & Son.

Architects and Builders
Berlin Iron Bridge Co.
Pencoyd Bridge & Construction Co.
Scaife, Wm B. & Son.

Assayers and Chemists' Supplies
Alinsworth, Wm.
Baker & Adamson.
Baker & Co.
Berg, J. & H.
Bullock & Crenshaw
Denver Fire Clay Co.
Henry Hill Chem. Co.
Ingersoll, Wm.
Miners' Assay Office
Overbrook Chem. Co.
Attorney, Corporation
Melndoe, H.

Babbit's Metal
Sping, Carpentier & Co.

Band Wheels
Poole, R., & Son Co.

Bankers and Brokers
Sandell, E.
Sieber & Solme
Billings, Robt. & Co.
Grant, E. R.
Handy & Harman.
Hicks & Sprague.
New Mexico M. Ex. Co.
Belting
Grotzinger & Sons.
Hendrie & Bolthoff
Mfg. Co.
Jeffrey Mfg. Co.
Blasting Caps and
Lau, J. B., & Co.
Mason, James, & Co.
Flowers
Garden City Sand Co.
Butter Compound
American Portland Co.
Pittsburg Roller Scale
Resolvent Co.

Bariters
Babcock & Wilcox Co.
Pollock, Wm. B., & Co.
Scaife, Wm. B. & Sons.
(See Machinery.)

Brass Castings
Sping, Carpenter & Co.

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

Brattice Lining
Mineralized Rubber Co.

Brick Machinery
Fletcher, S. K.

Bricks
Scaife, Wm. B. & Sons.
See Machinery.

Cable Railways
Ganter-Griffin Sus. Ry. Bridge Co.
Poole, R., & Son Co.

Calculators
Smith, E. C.

Carbide
Bishop, Victor, & Co.
Hoselmann, Louis F.

Car Wheels
Whitney & Co.

Cement
Atlas Cement Co.

Chain and Link Belting
(See Belting.)

Chemicals
Baker & Adamson.
Bullock & Crenshaw.
Henry Hill Chem. Co.
Overbrook Chem. Co.
Chlorine Liquid
Pickhardt, Wm., & Kuttrof.
Clutches, Friction
Poole, R., & Son Co.

Coal
Berwind-White Coal
Mg. Co.
Cassner & Curran
Consolidation Coal Co.
Coxe Bros. & Co.
Haddock, Shook & Co.
Coal Cutters
Ingersoll-Sergeant Drill Co.
Jeffrey Mfg. Co. (See Machinery.)
Coal Tipples
Youngtown Bridge Co.

Coal Ovens
Sheffield Car Co.

Concentrators, Crushers, Pulverizers, Separators, Etc.
Allis, Ed. P. & Co.
American Mining & Milling Machinery Co.
Beckett Foundry & Machine Co.
Blake, Theo. A.
Boston Ore Machinery Co.
Courade Iron Works
Fraser & Chalmers.
True Vanner Concentrator.
Gates Iron Works.
Hendrie & Bolthoff Mfg. Co.
Krom, S. R.
Mechanical Gold Extractor Co.
Stedman Foundry & Mach. Co.
Valhurn-Swenson Mfg. Co. (See Machinery.)

Conduit, Fibre
Fibre Conduit Co.

Copper Dealers and Producers
Abbott, Wheelock & Co.
American Metal Co.
Atlantic Mining Co.
Balsbach S. & Ref. Co.
Baltimore Cop. Wks.
Butte & Boston M. Co.
Canadian Copper Co.
Central Mining Co.
Copper Queen Mfg. Co.

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

Contractors and Miners' Supplies
Bucyrus Steam Shovel and Dredge Co.
Pollock W. B., & Co.
Fratt & Whitney Co. (See Machinery.)
Briton Iron Bridge Co.
Scaife, Wm. B. & Sons
Crucibles, Graphite, Etc.
Stedman's Foundry & Machine Works.
Garden City Sand Co.
Obermayer Co.

Cranes
King & Andrews Co.
Crushed Quartz
Garden City Sand Co.

Crosses
Garden City Sand Co. | Obermayer Co.

Dermatolite
Grotzinger & Sons.

Diamonds
Bluhm, Victor & Co.
Lewow, Theodore.
Diamond Drills
Bluhm, Victor & Co.
Hoselmann, L. F.
Bullock Mfg. Co., M.C.
Hasenahl, W.
Lewow, Theodore.
(See Air Compressors and Rock Drills.)

Drawing Materials
Alexander, Theo. & Son.
Queen & Co.

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

Dredging Machines
Poole, R., & Son Co.

Dump Cars
Hunt Co., C. W.
Truax Mfg. Co. | Wright & Adams Co.

Educational Institutions
Columbian University.
Correspondence School of Mines.
Harvard University.
Mass. Inst. of Technology.
Michigan Mining School.
Missouri School of Mines.
Pennsylvania Military College.
Woods' Seminary.

Electrical Machinery and Supplies
General Electric Co.
Jeffrey Mfg. Co.
King & Andrews Co.
Thomson-Houston International Co.

Elevators, Conveyors and Hoisting Machinery
Brown Hoisting and Convey. Mach. Co.
California Wire Works.
Cooper, Hewitt & Co.
Elliott, Frank C.
Jeffrey Manufacturing Co.
Scaife, Wm. B. & Sons.
Union Wire Rope Tramway Co.
Vulcan Iron Works.
(See Wire Rope Tramway and Machinery.)

Elevator, Grain, Machinery
Poole, R., & Son Co.

Emery Wheels
New York Belting & Packing Co., Ltd.
Employment Bureau
Engineering Employment Bureau.

Engineers, Chemists, Metallurgists
Kennedy, Julian.
Kent, William.
Kerr, Mark B.
Keyes, W. S.
Kirby, E. B.
Lammers, J. L.
Langmuir, Werner.
Lavagnino, G.
Leducq, Thomas H.
Loring, Frank C.
Mariner & Hoskins.
Martinez, Dion.
Maynard, George W.
McDermott & Dumfeld.
Merwin & Richardson
Minger, W. C.
Mixer & Dubois.
Moore, Gordon E.
Packard, W. E.
Nicholson, Frank.
O'Brien, Frank.
Oleott, Eben E.
Paine, Wm. Byrd.
Penrose & Harringer.
Peterson, Edward J.
Phillips, W. B.
Pierce, Wm. E.
Porter, J. & Son Co.
Potter, William B.
Randolph, John, C. F.
Raymond, Rossier W.
Raymond, B. H.
Rickard, T. A.
Ricketts & Banks.
Robinson, G. H.
Schwell, John H.
St. Louis, Richard P.
Schwartz, Theodore E.
Snodgrass, W.
Shields & Middleton.
Sikes, Edward.
Smith, R. C.
Squire, Jos.
Stein, Wm. M.
Stouder, A. G.
Taylor & Brunton.
Terhune, Richard H.
Tines, A.
Trent, L. C.
Van Sledright, Wm.
Walker, Richard P.
Wanzenmaier, J. F.
Wilson, J. Howard.
Wyatt & Saabach.
Young & Park.

Engineers' Instruments
Atencider, T. & Son.
Brand's Sons.
Bullock & Crenshaw
Gurley, W. & L. S.
Engines
Armstrong Brothers.
Buckeye Engine Co.
Bullock, M. C., Mfg. Co.
Machine Hardware Co.
Union Iron Works.
(See Machinery.)

Excavators
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.

Fans, Steam
Cole, Wm. E.

Fertilizer Machinery
Poole, R., & Son Co.

Fibre Conduit
Fibre Conduit Co.

Fire-Brick and Clay
Denver Fire Clay Co.

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

Fluor spar
Obermayer Co.
Poole, R., & Son Co.
Fuses
Poole, R., & Son Co.
Foundry
Obermayer Co.
Foundry Supplies
Poole, R., & Son Co.
Furnaces
Pollock, W. B. & Co.
Sheffield Car Co.
(See Machinery.)

Gas Engines.
Weber Gas & Gasoline Engine Co.
White & Middleton.

Gas Works
Pollock, Wm. B. & Co. | Wood, R. D. & C.
Gauges, Recording, Etc.
All-n. Chas. A.
Bristol Mfg. Co.

Gearing
Poole, R., & Son Co.

Grain Elevators
Poole, R., & Son Co.

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

Hangers
Poole, R., & Son Co.

Heavy Machinery
Poole, R., & Son Co.

Hoppers
Mueller Mfg. Co.

Hose, Rubber, Etc.
Allen, Chas. A.
Mineralized Rubber Co.
New York Belting & Packing Co., Ltd.
Inj. etc.
Young Lock Nut Co.

Insulation and Tests
Bunt, The Robert W. Co.

Insulated Wires and Cables
Okonite Co., Ltd.

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'
Stieren, Wm. E.

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

Locomotives
Porter, H. K., & Co.
Thomson-Houston International Co.

General Electric Co.
Thomson-Houston International Co.

Lubricants
Crucible Co.

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

Machinists
Poole, R., & Son Co.

Marie's Knives
Poole, R., & Son Co.

Machinery
Dealers in Mining, Milling, and Other Machinery
Etna Fdy. & Mach. Co.
Allis, Edw. P., & Co.
Amer. Mining & Milling Machinery Co.
Armstrong Brothers.
Beckett Foundry & Machine Co.
Boston Ore Machinery Co.
Buckeye Engine Co.
Bullock, W. 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.
Mechanical Gold Extractor Co.
Meeklenburg Ir. Wks.
Johnson, Matthey & Co.
Lehigh Iron Works.
Mathison Smelting Co.
Orford Copper Co.
Phelps, Dodge & Co.
Picher Lead Co.
State Ore Sampling Co.
Victor Chemical Co.
Wright & Adams Co.
Youngtown Bridge Co.

Metal Dealers
Abbott, Wheelock & Co.
American Metal Co.
Am. Zinc-Lead Co.
Baker & Co.
Bath, Henry & Son.
Eureka Co.
James & Shankspeare.
Metallurgical Works and Ore Purchasers' Processes
American Zinc Lead Co.
Baker & Co.
Balsbach Smelting & Refining Co.
Baltimore Copper Works.
Canadian Copper Co.
Kansas City S. & Ref. Co.
Leducq & Co.
Mechanical Gold Extractor Co.
Orford Copper Co.
Pennsylvania Salt Mfg. Co.
Ricketts & Banks.
Russell Process Co.
St. Louis, Richard P.
State Ore Sampling Co.
Valhurn-Swenson Mfg. Co.

Mine Cars
Sheffield Car Co.

Miners and Land Companies
Eureka Co.
Golden R'f Mfg. & M. Co.
Hicks & Sprague.
Ingersoll, Wm. B. & Co.
Quebrada R. K. L. & Co.
Tamarack Mfg. Co.

Moulding Sand
Garden City Sand Co.

Nickel
Canadian Copper Co.

Nuts, Lock
Young Lock Nut Co.

Ore Crushers
Truax Mfg. Co.

Ore Testing Works
Hunt & Robertson.
Leducq & Co.

Packing and Pipe Coverings
Strand, Handolpa.
Jenkins Bros.
Kenny Roth
Mineralized Rubber Co.
Patents
Atkins J. L.

Perforated Metals
Atcherson, R., Perf. Metal Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

Periodicals
Arms and Explosives.
Australian Mfg. Stand'd.
El Minero Mexicano.
Electrical Plant & Engineering Society.
Financial Times.
Ricketts & Banks.
Trenton Iron Works.
Treaty, Paul C.

Phosphor-Bronze
Phosphor-Bronze Smelting 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.

Portland Cement
Atlas Cement Co.

Powder
Etna Powder Co.
Laffin & Hand Powder Co.
Lau, J. H., & Co.
Poole, R., & Son Co.

Presses
Etna Fdy. & Mach. Co.
Allen, Chas. A.
Hase, Geo. F., Mfg. Co.
Cameron, A. S., Steam
Pump Works.
Epping, Carpenter & Co.
Grotzinger, A., & Sons
Jeansville Iron Wks.
Worthington, Henry.

Publications
Allison's Journal Co.
Arms & Explosives.
Australian Mining Standard.
Electrical Plant & Engineering Society.
Electrical Industry.
Engineering Society.
Hoselmann, L. F.
Ingersoll-Sergeant Rock Drill Co.
Rand Drill Co.
Sullivan, Machinery Co.
Union Wire Rope Tramway Co.

Quicksilver
Eureka Co.

Railroads
St. L. R. R.

Railroad Supplies and Equipment
Garden City Sand Co.
Hunt, C. W., Co.
Porter, H. K., & Co.
(See Machinery.)
Lunkenheimer Co.
Eddy Valve Co.
Hick Drills, (See Air Compressor.)
Hoselmann, L. F. Machinery
Poole, R., & Son Co.

Roofing
Berlin Iron Bridge Co.
Bolton Iron & Steel
Roofing Co.
Pencoyd Bridge and Const. Co.

Rope Wheels
Poole, R., & Son Co.

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

Safety Lamps
Wm. E. Stieren.

Saws
Atcherson, R., Perf. Metal Co.
Exeter Machine Works Co.
Harrington & King Perforating Co.
Tyler, W. S., Wire Works Co.
(See Machinery.)

Screen Plates
Harrington & King Perforating Co.

Separators
Harrington Safety Boiler Works.

Shafting
Poole, R., & Son Co.

Shoes and Dies
Chrome Steel Works. | Crescent Steel Co.
Bucyrus Steam Shovel & Dredge Co.
Southern & Co.

Smelting and Refining Works
Balsbach S. & Ref. Co.
Baltimore Cop. Wks.
Bos. & Co. Smelt. Co.
Cowan Smelt & Ref. Co.
Kansas City S. & Ref. Co.
Mathison Smelting Co.
Smelt. Co.
Sole, Wm. E.

Steel Rails, Castings, Rolls, Drill Steel
Abbott, Wheelock & Co.
Bolton Iron & Steel
Chester Steel Cast. Co.
Chroms Steel Works.
Crescent Steel Co.
Exeter Machine W. Co.
Harrington, A., Fdy. Co.

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

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

Telegraph Wires and Cables
Okonite Co., Ltd.
The
Wire Plate Rolling Machinery
Poole, R., & Son Co.

Tools
Fratt & Whitney Co.

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

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

Tarbins
John Soffel & Co. The.
Poole, Robt. & Son Co.
Stilwell-Sierce & Smith-Valle Co.

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

Valves
Eddy Valve Co. | Lunkenheimer Co.
Jenkins Bros. | Mason Regulator Co.

Ventilators
Bullock, M. C. Mfg. Co.
Valhurn-Swenson Wheel
New York Belting and Packing Co., Ltd.

Washers
Wilton Mfg. Co.

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

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

Well Drilling Machinery
Boselmann, L. F.
Penn Diamond Drill & Mfg. Co.
Sullivan Machinery Co.
Wells as such.

Wheels, Car
Sheffield Car Co.

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

Wire Ropes
Atcherson, R., Perf. Metal Co.
Harrington & King Perforating Co.
Tyler, W. S., Wire Works Co.
Wire Ropes & Wire
Rope Co.
Broderick & Bascom
Rope Co.
California Wire Wks.
Cooper, Hewitt & Co.
Hunt, C. W., 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.

1325 WANTED—A THOROUGHLY COMPETENT master mechanic to take charge of the machinery of a copper mining and smelting concern in the Northwest. Apply, stating age, experience and references. Address letters MONT, ENGINEERING AND MINING JOURNAL.

1326 WANTED—FOREMAN MACHINIST—one who would appreciate an opportunity for advancement; sobriety and ability must be unquestioned; prefer one who has some knowledge of draughting and has had experience in the manufacturing of water-tube boilers; state age, nationality, wages desired and references. Address MACHINIST, ENGINEERING AND MINING JOURNAL.

1327 WANTED—A SALESMAN WELL acquainted with the steel trade, particularly in the Eastern States. Address STEEL TRADE, ENGINEERING AND MINING JOURNAL.

1328 WANTED—AN ANALYTICAL chemist thoroughly versed in the analysis of gold, silver, copper and lead ores. Applicant must be able to purchase at least \$500 of the company's stock. A salary of \$100 monthly is guaranteed to the right man for the first few months, with great chances for increase. Address COLORADO, ENGINEERING AND MINING JOURNAL.

1329 WANTED—AN ASSISTANT CHEMIST and assayer in a shop refining precious metals. Address, stating age, experience, and wages expected, ASSISTANT, ENGINEERING AND MINING JOURNAL.

1330 WANTED—EXPERIENCED CHEMIST for blast furnace. One willing to help in office preferred. Give experience, references, and full particulars. Address IVANHOE, ENGINEERING AND MINING JOURNAL.

1331 WANTED—A DRAUGHTSMAN who has had some experience in designing mining machinery, and who is a graduate of some good mechanical school. A permanent position for the right man. Address MECHANICAL, ENGINEERING AND MINING JOURNAL.

1332 WANTED—A MANAGER THOROUGHLY familiar with the manufacture of alum. Address ALUM, ENGINEERING AND MINING JOURNAL.

1333 WANTED—EXPERIENCED CONTRACTORS to join in sinking a deep shaft through wet ground. Must be able to command \$100,000; very large profits can be made on the job. SHAFT, ENGINEERING AND MINING JOURNAL.

1334 WANTED—MINING ENGINEER and assayer, speaking and writing Spanish, for silver mines; salary \$75. Address, with full particulars as to experience and references, ZACATEC, ENGINEERING AND MINING JOURNAL.

1335 WANTED—CHEMIST WHO HAS had some experience with fireclays. Salary, \$65 per month to commence with. Address, with references, FIRECLAY, ENGINEERING AND MINING JOURNAL.

Situations Wanted.

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

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 GENERAL MACHINIST WANTS A SITUATION as Foreman. Address STEAM, ENGINEERING AND MINING JOURNAL. No. 16,397, June 30.

CHEMIST DESIROUS OF MAKING A change wants position. Best references. Address H. A. B., ENGINEERING AND MINING JOURNAL. No. 16,504, June 2.

A MECHANICAL DRAUGHTSMAN DESIRES engagement. Address STAFF, ENGINEERING AND MINING JOURNAL. No. 16,508, June 9.

POSITION WANTED BY A PRACTICAL Copper Smelter of several years' experience, well posted in the treatment of ores, refining, assaying and erection of smelting plant. Can introduce Napier's improved system of copper smelting. Address INGOT, ENGINEERING AND MINING JOURNAL. No. 16,512, June 22.

POSITION WANTED BY FIRST-CLASS MACHINIST as master mechanic, foreman or any position where ability and faithful services will be appreciated. Experience in marine and stationary engines and rolling mill machinery, good draughtsman. Vicinity of New York preferred. Address HUSTLER, ENGINEERING AND MINING JOURNAL. No. 16,502, June 9.

POSITION WANTED AS ASSISTANT TO mine manager or mining engineer, by a recent graduate of the Columbia College School of Mines. Address METAL MINING, ENGINEERING AND MINING JOURNAL. No. 16,500 ff.

A MINING ENGINEER WILL SHORTLY BE open to re-engagement as Manager or Superintendent of Mines and Mills. Has wide experience in gold, silver and copper. Highest references from present and past employers. Address TRANSIT, ENGINEERING AND MINING JOURNAL. No. 16,495, June 23.

CHEMIST OF NINE YEARS' EXPERIENCE in metallurgical works is open to engagement. Best of references. H. N. YATES, Lockport, N. Y. No. 16,482, ff.

WANTED—SITUATION BY A GOOD, ALL-ROUND Machinist, sober and reliable; general work, tool making, special or experimental work. Address C. S. MICHENER, Box 134, Kalamazoo, Mich. No. 16,512, June 2.

RELIABLE AND ACCURATE MECHANICAL Draughtsman, age 25, desires position. R., ENGINEERING AND MINING JOURNAL.

**Contracts Open.**

TREASURY DEPARTMENT, Office Supervising Architect, Washington, D. C., May 22d, 1894.—Sealed proposals will be received at this office until 2 o'clock p. m. on the 27th day of June, 1894, and opened immediately thereafter, for all the labor and materials required for the superstructure and completion (except heating apparatus and approaches) of the U. S. Court House and Post Office building at Mankato, Minnesota, in accordance with drawings and specification, copies of which may be had at this office, or at the office of the Superintendent at Mankato, Minnesota. Each bid must be accompanied by a certified check for sum not less than 2% of the amount of the proposal. The right is reserved to reject any or all bids or to waive any defect or informality in any bid should it be deemed in the interest of the Government to do so. All proposals received after the time stated will be returned to the bidders. Proposals must be inclosed in envelope, sealed and marked, "Proposal for the Superstructure and Completion (except Heating Apparatus and Approaches) of the U. S. Court House and Post Office Building at Mankato, Minnesota," and addressed to JEREMIAH O'ROURKE, Supervising Architect.

PIPING, CASTINGS, VALVES, ETC.—Proposals are wanted until June 21 for furnishing a quantity of water pipe, special castings, gate valves, fire hydrants, etc. Address E. M. BIGELOW, Director of Department of Public Works, Pittsburg, Pa.

ORDNANCE SUPPLIES.—Benicia Arsenal, Benicia, Cal.—Sealed proposals, in triplicate, will be received until June 4th, 1894, for furnishing leather, coal, iron, hardware, lumber, forage, etc., during the fiscal year ending June 30th, 1895. Printed lists of supplies needed, with full instructions, stipulations, etc., can be had on application to Lieut.-Col. L. S. BABBITT, Ordnance Department, U. S. Army, Commanding.

IRON SPANS.—Bids, plans and specifications are solicited for placing two 60-ft. iron spans in place of the present wooden approaches to the drawbridge across the Ocmulgee River in Pulaski County. I will pass upon all bids, etc., that may be sent in until June 13. For further information apply to P. T. MCGIFF, Ordinary, Hawkinsville, Ga.

BRIDGES.—The auditor was instructed to advertise for bids for iron, wood and combination bridges to be built during the season, said bids to be sealed and filed with the County Auditor on or before June 4th. J. F. DAUGHERTY, Chairman; JOHN WALLJASPER, County Auditor, Fort Madison, Ia.

WATER-WORKS.—Sealed proposals will be received by the village council for a complete system of water-works for the village of Lamberton, Minn., consisting of water-tower, tank, stand-pipe, water mains, hydrants, etc.; also windmill. Bids to be opened June 20, 1894. Plans and specifications can be seen at the office of the village recorder, Lamberton, Minn. G. B. TRETBAR, Village Recorder.

The Most Successful Process for the Extraction of Gold.

IMPROVED BARREL CHLORINATION.

The undersigned has completed drawings and plans of the latest improvements in Barrel Chlorination, and is open to engagement for the testing of ores, the erection and operation of plants of any capacity. The most successful works in this country were managed by the undersigned.

Correspondence solicited.

JOHN E. ROTHWELL,
ENGINEERING AND MINING JOURNAL, New York.

BRIDGE.—State of Georgia, County of Pulaski, Court of Ordinary, Hawkinsville, Ga.—Bids, plans and specifications are solicited for placing two (2) 60-ft. iron spans in place of the present wooden approaches to the drawbridge across the Ocmulgee River in said county. I will pass upon all bids, etc., that may be sent in before the 13th day of June, 1894, at my office in Hawkinsville, Ga. The right to reject any and all plans and bids is reserved. For further information apply to P. T. MCGIFF, Ordinary, Pulaski County.

IRON, STEEL, HARDWARE, ELECTRICAL Supplies, Etc.—Sealed proposals, in triplicate, will be received until June 14th, 1894, for furnishing iron, steel, hardware, lumber, forage, fuel, electric materials and supplies, oils, etc., during the fiscal year ending June 30th, 1895. List of supplies needed, with full instructions, stipulations, etc., can be had on application to Captain FRANK BRATH, Ordnance Department, Governor's Island, N. Y.

CYLINDER AND MACHINE OIL.—Sealed proposals will be received until June 16th, 1894, for supplying cylinder and machine oils during the fiscal year ending June 30th, 1895, to certain United States buildings. Particulars will be furnished upon application to undersigned. Proposals should be addressed to the Secretary of the Treasury and indorsed "Proposals for Oil for United States Buildings." S. WILKE, Acting Secretary, Washington, D. C.

PIPING, CASTINGS, ETC.—Proposals are wanted until June 21st for furnishing a quantity of water pipe, special castings, gate valves, fire hydrants, etc. Address E. M. BIGELOW, Director of Department of Public Works, Pittsburg, Pa.

WATER-WORKS.—Barron, Wis.—Sealed bids for the water-works system complete or for any part of the work or materials will be received until June 15. Bids to be accompanied by certified check for 10 per cent. of the amount bid. Plans and specifications on file with City Clerk and with Pike & Sublette, Engineers, Guaranty Loan Building, Minneapolis. Payments to be in cash. Mark envelope "Bid for Water-Works." CLARENCE C. COE, President of Council.

WATER-WORKS.—Sealed proposals for the construction of water-works, consisting of about 1 mile main line and about 3 miles village distribution, will be received until June 14. Plans and specification can be seen at his office and further information can be obtained by addressing EDMUND BROWN, Secretary, Norfolk, Conn.

IRON, STEEL, HARDWARE, LUMBER, ETC.—New York.—Sealed proposals, in triplicate, will be received until June 12, 1894, for furnishing iron, steel, hardware, lumber, fuel, oils, etc., during fiscal year ending June 30, 1895. Lists of supplies needed, with full instructions, stipulations, etc., can be had on application to Major ISAAC ARNOLD, Jr., Ordnance Department, West Troy, N. Y.

IRRIGATION, Ottawa, Ill.—Sealed bids will be received by the Commissioners of Drainage District No. 2, Wallace Township, until June 13, for the construction of the proposed ditches in the district. Bids will be received for all or part of the work. The work comprises about 80,000 cubic yards of excavation. A certified check for 2 per cent. of the amount bid on must accompany each bid, the same to be forfeited to the district on failure of the bidder to enter into contract with the commissioners within five days after award of contract. For further information address WILLIAM H. IRWIN, Engineer.

IRON PIPE, HARDWARE, ELECTRICAL Supplies, etc.—Sealed proposals will be received by the Board of Commissioners of the Colorado State Penitentiary, at Canyon City, Col., until June 4th, for the following: 24 bars half-round iron $\frac{3}{4}$ - $\frac{3}{4}$; 12 bars tire iron $\frac{3}{4}$ x $\frac{3}{4}$; 200 lbs. Norway iron $\frac{3}{4}$ - $\frac{3}{4}$ x 2; 50 lbs. $\frac{3}{4}$ hoop iron for rails; 1 box tin 3 xxx; 2 pieces galvanized iron No. 22; 6 dozen files, assorted; 2 kegs horseshoes; 2 boxes toe corks; 25 lbs. washers, $\frac{3}{4}$ - $\frac{3}{4}$; 400 bolts $\frac{1}{2}$ x $\frac{1}{4}$ -2; 10 dozen hammer handles; 10 dozen heavy pick handles; 1 dozen each ax and hoe handles; also a lot of electrical supplies, iron pipe, steam fittings. Lists to be had on application to the Warden. All bids and supplies should be addressed to "The Board of Commissioners Colorado State Penitentiary Canyon City, Col." indorsed "Proposals for Subsistence, Etc." CHARLES BOETCHER, President.

BRIDGE.—The county supervisors will let contract for Des Moines River bridge June 9th. T. CUNNINGHAM, Auditor, Fort Dodge, Ia.

Continued on page 19.

CHLORINE LIQUID

For Extraction of Gold.

FOR SALE BY

WM. PICKHARDT & KUTTROFF,

98 LIBERTY STREET, NEW YORK.

MACHINERY AND SUPPLIES FOR SALE.

**STEEL RAILS,
NEW OR SECOND-HAND.**

We can furnish any weight of New Rails. We also have for immediate delivery 400 tons of Second-Hand 60 lb. Steel T Rails, 100 tons 35 lb. Girder and 300 tons 45 lb flat steel; all well fit to relay, and cheap.

**ROBINSON & ORR,
No. 419 Wood Street, Pittsburg, Pa.**

FOR SALE.

Smelting Plant at Trinidad, Colo.,

all equipped, ready to start up. Situated just outside city limits Trinidad, on a 294-acre tract of land adjoining a river. Side tracks from two competing railway lines. Description of Smelter Buildings and their contents, also photos of works, may be found at the office of ENGINEERING AND MINING JOURNAL.

For terms apply to **MILWAUKEE AND TRINIDAD SMELTING AND REFINING COMPANY, Milwaukee, Wis.**

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.**

- | | |
|---|-------------|
| 8" x 12" Hoisting Engine—two cylinders, single drum, 42" x 40" grooved for holding 500 ft. 7/8" rope in single coil | 8,000 lbs. |
| 33" x 31" Galena Silver Furnace—Steel Jackets and Curb, Ball Joint Tuyeres, Corner Discharge Boxes, Spouts, Leadwell, Binder, Slack, etc. | 20,000 lbs. |
| 2 Collom Jigs, complete. | |
| 1 Slide Motion Jig, 2 compartments. | |
| 1 Brunton Sampler No. 2. | |
| Rotary Screens—One train of three. Each 35" diameter, 96" long, complete with perforated iron coverings and steel housings. | 7,500 lbs. |
| 2 Silver and Gold Mortars. | |
| 2 Slag Pots and 1 Scoop Car. | |
| 2 Tulloch Feeder and 2 Bullion Molds. | |
| 1 Sectional 4 x 6" Dodge Crusher. | 1,200 lbs. |
| 2 " 10" x 24" Retort complete. | 2,500 lbs. |
| 1 " 14" x 33" Corliss Engine. | 30,000 lbs. |
| 1 " 44" x 14" Boilers. | 22,500 lbs. |

LOCOMOTIVE AND RAILS.

SADDLE TANK, standard gauge Locomotive; weight, 10 tons; in use 12 months and in A1 condition, for sale, cheap, and on Easy Terms. Also Light and heavy Section Relaying Rails.

**SOUTHERN IRON & EQUIPMENT CO.,
ATLANTA, GA.**

Received Too Late for Classification.

A FIRST-CLASS MECHANICAL draughtsman wants position; machine tools and general machinery. **SEABROOK, 56 Sixth Ave., New Brighton, S. I.** No. 16,523, June 2.

SITUATION WANTED BY AN ENER-getic civil and mining engineer of six years' experience as mine superintendent and mining engineer. Can give good references. Address **PLYMOUTH, ENGINEERING AND MINING JOURNAL.** No. 16,523, June 2.

AN ALL-ROUND CIVIL ENGINEER (thoroughly American) familiar with Spanish language and customs, capable of taking full charge, willing to be an assistant. If with general contracting firm prefer an interest to salary; at present second chief engineer; employers as reference. Experienced in handling, reconnaissance, preliminary, location, construction and men, both as engineer and superintendent. Parties needing the same (especially those interested in South American enterprises) address **CHARACTER, ENGINEERING AND MINING JOURNAL.** No. 16,527, Aug. 4.

MINING ENGINEER — YOUNG MAN, good assayer, surveyor and draughtsman, experience in mining and milling of gold ores, desires suitable position. Address **W. G. K., ENGINEERING AND MINING JOURNAL.** No. 16,524, June 23.

MECHANICAL DRAUGHTSMAN (SWEDE) is open for engagement. Address **U. M., ENGINEERING AND MINING JOURNAL.** No. 16,525, June 2.

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. TREAKLE,** Sec'y, Room 1505, No. 79 Dearborn St., Chicago.

MISCELLANEOUS WANTS.

WANTED—PARTNER OR PARTNERS TO organize a stock company for manufacturing a patented automatic coal, clay and freight conveyor. In demand; \$3,000 stock already insured for \$1,500, or for the sale of the same. Illustrated catalogue on application. Address **L. BOUDREAU,** No. 170 E. Spruce Street, Manchester, N. H.

WANTED

to buy a cheap second-hand **ROCK BREAKER.** Address **MYLES & CO.,** No. 16,508, June 1. New Orleans, La.

WE BEG TO ANNOUNCE THAT OUR Mr. Ede, M. E., leaves here early in April to examine mineral properties in New Mexico, UTAH, Colorado, Oregon and South Dakota. He will undertake other work for private parties or companies. Twenty years' experience. Reference exchanged.

**EDE & BURWELL, Mining Engineers,
21 QUINCY STREET, CHICAGO.**

**THE GOLD AND SILVER
EXTRACTION COMPANY**

TRADE MARK OF AMERICA, LIMITED.



MacARTHUR-FORREST Process. CAPITAL, £110,000 Sterling.

TO MINEOWNERS and others having Refractory Gold and Silver ores hitherto untreatable at a profit, the MacArthur-Forrest (Patent) Process of gold and silver extraction offers a solution of the difficulty.

Advisory Board in the United States: **THOMAS W. GOAD, Mgr.** DENVER, **HUGH BUTLER, Atty.** COLO., **JOHN F. BELL,** **P. GEORGE GOW.**

OFFICE: McPhee Building, - Denver, Colo.

Contracts Open Continued from page 18.

FUEL.—Governor's Island, N. Y. H.—Sealed proposals, in triplicate, for furnishing such quantities of fuel as may be required in the Department of the East during the fiscal year commencing July 1, 1894, will be received here, and at offices of Quartermasters at Baltimore, Md.; Boston, Mass.; Buffalo, N. Y.; New Orleans, La.; Fort Niagara, N. Y.; Fort Ontario, N. Y.; Madison Barracks, N. Y.; Plattsburg Barracks, N. Y.; Fort Preble, Me.; Fort Adams, R. I.; Fort Trumbull, Conn.; Fort Monroe, Va.; Newport Barracks Ky.; Fort Thomas, Fla.; Fort McPherson, Ga.; St. Francis Barracks, Ala., and Mount Vernon Barracks, Ala., until June 8, 1894, and then opened. Information furnished on application to this office, or to Quartermasters at posts named above. Envelopes containing proposals will be indorsed "Proposals for Fuel." **CHAS. H. TOMPKINS, Asst. Q.-M.-Gen.**

RICO-ASPEN CONSOLIDATED MINING COMPANY.

DENVER, Colo., May 26th, 1894. A dividend of two and one-half cents per share, twenty-five thousand dollars, has been declared, payable June 10th, to stockholders of record on June 5th. Transfer books close June 5th, and reopen June 12th. Transfers of stock to be made at the general office 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.**

The Only Treatise on **MINING METALLURGY**

Markets and Uses of the Commercial Minerals and Metals that is

ABSOLUTELY UP TO DATE.

The Mineral Industry,

Its Statistics, Technology and Trade, from the Earliest Times to the close of 1893.

OUT. OUT. OUT.

This great volume of more than one thousand pages treats of minerals and metals and their products, and contains numerous technical monographs of the greatest value.

Every one interested in knowing the very latest and best methods in use for producing, extracting, and refining the useful minerals and metals, and the amounts and values of each produced and consumed in every part of the world, can find the information in this great work, and in no other book published in any language.

2d ANNUAL VOLUME. PRICE \$5.00.

Order before the supply is Exhausted.

THE SCIENTIFIC PUBLISHING CO., Publishers, 253 BROADWAY, NEW YORK.

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, Bellfonte Pa.

THE HASENZAHL
DIAMOND BIT ROCK DRILL
FOR HAND AND OTHER POWER.
Brings out a Core. Write for Particulars.
WM. HASENZAHL, Mfr.,
135 West Second Street, Cincinnati, Ohio.

HUNT & ROBERTSON,
77 PINE ST., NEW YORK,
ANALYSTS & ASSAYERS,
MINING ENGINEERS.
Specialty Made of Copper Metallurgy.

THE CANADIAN COPPER CO.
HEAD OFFICE:
Room 201 Perry-Payne Bldg., Cleveland, O.
Miners and Smelters of Copper-Nickel
Ores at Sudbury, Ontario, Can.
COPPER AND NICKEL.

BALTIMORE
Copper Smelting and Rolling Company
(THE BALTIMORE COPPER WORKS).
Office: KEYSER BUILDING,
BALTIMORE, MD.
INGOT COPPER. SHEET COPPER.

J. STOCKLY CARY, Chemist and Assayer Dep't of Mines and Mining, Chemist of National Bureau of Awards, World's Columbian Exposition.
JOHN E. MOORE, formerly with Rattie, Nye & Hollis, Rookery Building.
CARY & MOORE,
Analytical and Consulting Chemists, Samplers and Assayers,
1760 Monadnock Bldg., CHICAGO, ILL.
Specialty: Coal and Coke Analyses.

THE AMERICAN METAL CO.,
LIMITED,
80 Wall Street (P. O. Box 957), NEW YORK.
114 Laclede Building, ST. LOUIS, MO.
COPPER, COPPER ORES AND MATTES, TIN, LEAD,
SPELTER, ANTIMONY, NICKEL, ALUMINUM.
ADVANCES MADE ON CONSIGNMENTS.
Agents for Henry R. Merton & Co., London; Metallgesellschaft, Frankfurt-on-Main; Williams, Foster & Co., Limited, Swansea, Eng.; Pascoe Grenfell & Sons, Limited, Swansea, Eng.; Balbach Smelting & Refining Co., Newark, N. J.

ORFORD COPPER CO.,
COPPER SMELTERS
Works at Constable's Hook, N. J., opposite New Brighton, Staten Island. Copper Ore, Mattes, or Bullion purchased. Advances made on consignments for refining and sale. Specialty made of Silver-Bearing Ores and Mattes.

INGOT AND CAKE COPPER.
President, **ROBERT M. THOMPSON,**
Office, 37 to 39 Wall Street, New York.

JAMES & SHAKSPEARE,
ENGLAND.
1 Metal Exchange Buildings, London, E. C.,
AND
17 Irwell Chambers West, Liverpool.

METALS, MATTES AND MINERALS.
Cable Address, **METALLURGY, LONDON.**
Use A B C Code, 4th Edition.

Established 1845.
W. & L. E. GURLEY, TROY, N. Y.
Largest Manufacturers of Civil Engineers' and Surveyors' Instruments. Send for Illustrated Circular Price List showing latest improvements.

LEDOUX & CO.,
9 Cliff Street, New York.
Assayers and Engineers.

ORES, BARS, BULLION AND ALL FURNACE PRODUCTS SAMPLED AND ASSAYED.
Public Ore Yards and Sampling Works.
ADVANCES OBTAINED ON CONSIGNMENTS. PRINCIPAL BANKS AND METAL BUYERS ACCEPT OUR CERTIFICATES AS FINAL.
ASSAYERS BY APPOINTMENT TO NEW YORK METAL EXCHANGE.

RIGGETTS & BANKS,
104 John St., New York.
ORES TESTED!

Complete Ore Milling and Testing Works or making practical working tests of ores to determine the Best Method of Treatment. Milling, Metallurgical and Chemical Processes investigated.

Assays and Analyses!

CIRCULARS AND TERMS ON APPLICATION.

DR. HENRY FROEHLING,
Chemical and Metallurgical Laboratory.
7 South 12th Street, Richmond, Va.

Assays and analyses of ores, furnace products, clays, limestones, phosphates, waters, coals, oils, gases, etc. Price lists of analyses on application. Mines and mineral properties in the South examined.

HASTINGS, JOHN B.,
Consulting Mining Engineer.
Office: Broad St. House, Old Broad St., London, E. C., England.
Present Address: Boise City, Idaho, U. S. A.

HENRY BATH & SON,
London, Liverpool and Swansea,
BROKERS.

All Description of
Metals, Mattes, Etc.
Warehouses, Liverpool and Swansea.
Warrants Issued under their Special Act of Parliament.
NITRATE OF SODA.
Cable Address: - **BATHOTA, LONDON.**

FRANCIS M. SIMONDS, E. M., Ph. D.,
Experimental, Analytical and Assay Laboratories,
20 Platt Street, Corner of Gold, New York.
SPECIALTIES: Special Laboratory for Students and Business Men. Experimental Work on Chemical and Metallurgical Processes.

SEE PAGE

7.

THE HARRINGTON & KING PERFORATING CO.
CHICAGO.



METALS PERFORATED AS REQUIRED FOR MINING SCREENS OF ALL KINDS.
FOR USE IN
MILLING AND MINING MACHINERY, REDUCTION AND CONCENTRATING WORKS, WOOLFN, COTTON, PAPER AND PULP MILLS, RICE, FLOUR AND COTTONSEED OIL MILLS, SUGAR AND MALT HOUSES, DISTILLERIES, FILTER PRESSES,
STONE, COAL AND ORE SCREENS, STAMP BATTERY SCREENS, BRICK AND TILE WORKS, FILTERS, SPARK ARRESTERS, GAS AND WATER WORKS, OIL, GAS AND VAPOR STOVES, COFFEE MACHINERY, &TC., ETC.

STANDARD SIZES PERFORATED TIN AND BRASS ALWAYS IN STOCK.
Main Office and Works, 222 to 240 N. Union St., Chicago, Ill., U. S. A.
Eastern Office, No. 284 Pearl St., New York.

LEWISOHN BROTHERS,
P. O. Box 1247. 81 and 83 FULTON STREET, NEW YORK.
Advances made on Copper, Matte and Ores.
Agents for the following Mining Companies: Boston & Montana C. C. & S. Mining Co.; Tamarack Mining Co.; Butte & Boston Mining Co.; Osceola Consolidated Mining Co.; Arizona Copper Co., Ltd.; Keasarge Mining Co.

HIGH GRADE HOISTING ENGINES AND DRUMS.

We have some of the heaviest plants in the world in Iron, Copper and Silver Districts of United States.
OUR CORLISS ENGINES ARE DESIGNED EXPRESSLY FOR HOISTS
SEND FOR CATALOGUE.

OTHER SPECIALTIES.

Diamond Core Drills.
Rock Drills and Air Compressors.

Cable Address:
"BULLOCK."

M. C. BULLOCK MFG. CO.,
37 Canal Street, Chicago, Ill.