

THE ENGINEERING AND MINING JOURNAL AND



(Published Every Saturday at 253 Broadway, New York.)

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

VOL. LXIX. JUNE 2, 1900. No. 22.

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

SUBSCRIPTIONS ARE PAYABLE IN ADVANCE. For the United States, Mexico and Canada, \$5 per annum; all other countries in the Postal Union, \$7. REMITTANCES should be made by bank drafts, post-office orders or express money orders on New York, payable to the Scientific Publishing Co.

Main Office: 253 Broadway (P. O. Box 1833), NEW YORK. Telephone Number, 3,095 Cortlandt. New York Cable Address—"ROTHWELL." (Use McNeill's or A B C 4th Edition Code. London Cable Address—"PULCINETTO."

Branch Offices: Chicago, Ill 737 Monadnock Building, Phone 73 Harrison. Denver, Colo., Boston Building, Room 206. Salt Lake City, Utah, Atlas Building. San Francisco, Cal., 207 Montgomery St. City of Mexico, 104 Avenue Madrid. Robert S. Barrett, Manager.

Vancouver, B. C., Office, Molson's Bank Bldg. Wm. M. Brewer, Manager. London, Eng., Office, 20 Bucklersbury, 368. E. Walker, Manager. English subscriptions to the JOURNAL may be paid at the London Office at the rate of \$7 = £1 8s. 9d.; the publications of the Scientific Publishing Company may be bought at the rate of 4s. 2d. to the dollar, net.

CONTENTS.

Table listing contents with page numbers. Includes sections like Editorial Notes, Reporting Mining Accidents, Gold Production in 1899, United States Coal Production in 1899, Books Received, Abstracts of Official Reports, Personal, Obituary, Societies and Technical Schools, Industrial Notes, Trade Catalogues, Machinery and Supplies, Mining News, United States, Alaska, Arizona, California, Colorado, Delaware, Florida, Idaho, Iowa, Maine, Michigan, Minnesota, Missouri, Montana, Nevada, New Hampshire, New York, South Dakota, Utah, West Virginia, Foreign, Asia, Australasia, Canada, Markets, Coal, New York, Birmingham, Chicago, Cleveland, Shanghai, Slate, New York, Metals, Pig Iron Production, Birmingham, Buffalo, Chicago, Cleveland, Philadelphia, New York, Dividends, Meetings, Assessments, Stock Quotations, New York, Philadelphia, San Francisco, Boston, Salt Lake City, Toronto, Spokane, Colo. Springs, Montreal, Mexico, Denver, Paris, London, Chemicals and Minerals, New York, Liverpool, Mining Stocks, Market Reviews, New York, Boston, Salt Lake City, San Francisco, London, Paris, Current Prices, Minerals, Chemicals, etc., Advertisers' Directory.

The statistics for the eighth volume of "The Mineral Industry" are complete, and we publish in the following pages the general tables relating to Gold, Silver and Coal, containing the figures as collected and prepared for that volume. The volume itself is now on the press and, it is hoped, will be ready for distribution at an early date. It thus appears much sooner than has been the case with previous volumes.

The reports from San Francisco and the Puget Sound ports are that the number of persons who are on their way to the Nome District is already very large. The steamers which are ready to leave for the North have had to refuse both passengers and freight, being already loaded beyond their capacity. Later in the season much machinery of different kinds will be ready to ship, though it is not at all certain whether this can be used to advantage. When the dredges and other machinery, with which it is proposed to work the beach sand deposits, reach the district, it is feared that there will be trouble, as any attempt to appropriate large areas of the beach will not only be resented, but actively resisted.

Exports of manufactures continue to show an increase. In April they reached a total of \$39,424,269, against \$33,015,970 last year. In the 10 months of the fiscal year from July 1st to April 30th the statement of the Bureau of Statistics of the Treasury Department shows that the exports of manufactures reached a total of \$352,671,206, or 30.6 per cent. of the total exports, which compares with \$275,978,300, or 27.1 per cent. of the total, last year. The actual gain was \$76,692,906, and the proportional gain was 3.5 per cent. A part of this gain was, of course, due to increased prices, but a very considerable portion was an actual gain in quantities. The total amount of exports of manufactures this year is the largest ever reported; and the same may be said of the proportion of exports of manufactures to the total.

The reports of the Alaska Mexican and Alaska United companies for 1899 show that the working of the great deposits of low grade ores on Douglas Island in Alaska continues to be extended with good results. The close and careful management which makes it possible to earn dividends on ore running less than \$3 to the ton is worth careful observation. We have again to commend the very full details of costs and operations given in these reports, which are the most complete issued in that respect. The addition of a plan of the mines is also an excellent feature. There is, however, one omission, which is somewhat singular, in view of the general completeness of the reports; and that is the failure to give any assays of the tailings. We have the bullion saved, but cannot estimate the total contents of the ore, nor the proportion of the values saved. That proportion is probably high, but it would be more satisfactory to know just what it is.

The exports of coal from the United States, which are rather closely watched just now, reached in April a total of only 537,052 short tons, 473,140 tons being bituminous and 63,912 tons anthracite. The total was an increase of 149,242 tons over last year, Canada taking 82,145 tons of the gain, and 60.6 per cent. of the total exports. There was a small increase in shipments to the West Indies, and Brazil took 6,338 tons this year, against none last year. The exports to Europe this year were 31,994 tons, and compare with 7,295 tons last year; a large relative increase, but still a very small total. Of these shipments 10,237 tons went to France, which took only 1,000 tons last year.

For the 10 months of the fiscal year ending with April the total exports were 5,804,730 tons, showing the substantial gain of 1,734,245 tons, or 42.6 per cent., over the previous year. This increase, however, was all in sales to our two near neighbors, the shipments to Canada showing a gain of 1,535,146 tons, and those to Mexico one of 147,645 tons.

The war in the Transvaal has happily reached the end that everyone expected from its commencement, and the end which will best promote the liberty and prosperity of the Boers as well as the Outlanders.

The sad loss of life and heavy destruction of property mark, let us hope, the last difficulty which will ever occur to retard the development of the mineral resources of South Africa. British control, we know, is everywhere the assurance of personal liberty, security to property and of equal justice; it is the most beneficent government the world has ever known for the development of industry and commerce. We expect to see the gold output of the Transvaal grow and the prosperity of the country increase to the benefit of its citizens and of the world at large.

The sudden collapse of armed resistance, following the stubborn

fighting of the early part of the war, proves the point to which we called attention some time ago, and that is the difficulty of holding an undisciplined force together in times of disaster and defeat. We have not yet the full accounts, but it appears that no attempt was made to use the strong fortifications of Johannesburg or Pretoria; and the Boer army simply melted away and disappeared. Doubtless the progressive element, which has been really opposed to the war, was ready to seize the opportunity; but the rest of the fighting force seems to have joined in the movement.

How soon the mines of the Witwatersrand will be ready to resume work depends upon many conditions. Doubtless it will be several months before production is fully restored. Our letters from the Transvaal show that there is much to be done before matters resume their normal condition.

REPORTING MINE ACCIDENTS.

On another page we publish a very interesting and important article by Mr. F. L. Hoffman suggesting improved methods in compiling coal mine statistics. As Mr. Hoffman is the highest authority in this country on general life insurance statistics, and is a thoughtful, painstaking and truthful statistician, his suggestions are always worthy of consideration. With most of Mr. Hoffman's suggestions we fully agree, but our familiarity with the actual operations of coal mining and the conditions in and about the mines leads us to differ from or add to some of these suggestions.

There is very great need for improvement in the collection of coal mining statistics, for at present those that are collected differ in different countries or states materially and none of them give certain facts that are extremely important. It is important, as Mr. Hoffman says, to know the death or accident rate per 1,000 persons employed in the various occupations above and below ground; but unfortunately "the average number employed" in most cases is so indefinite a figure that it really means little more than would the expression "as big as a piece of chalk." The "average number employed" usually means a very rough guess at the number usually at work when the mine or works is running full; but as the anthracite mines of Pennsylvania for many years previous to 1899 worked only two, three or four days in the week, and at times worked reduced forces when they actually did run the accident rates based on the average number of men employed at the mines when working full, without specifying the time occupied, would be extremely misleading. Thus, if a mine when running full employed an average of 1,000 men, and if it ran only 150 days a year, so that consequently the men were exposed to mining accidents only 150 days in a year, it would be manifestly erroneous to compare the "accident rate per 1,000 employed" of these with the rate per 1,000 employed in occupations where the men work and are exposed to risk of accident 300 or 365 days in a year.

The first essential is therefore that statistics of labor should state the actual number of days of labor per annum a man expended in the labor and these necessarily give the number of days during which he is exposed to the risk of accident. In other words, the deaths and accidents should be counted per 1,000 days' labor in each occupation rather than per 1,000 persons employed for an unknown time.

It is not even sufficient that the "days" actually employed be given, but the average number of hours in the particular day meant should be stated, for it is manifestly inaccurate to compare the accident liability in days of 6 or 8 hours actual exposure to risk with those where the exposure is 10 to 12 hours per day. It is very easy to ascertain these necessary facts, for the actual days worked appear on the pay-roll of every mine, except in the cases of some kinds of contract or piece work, and even there they are not difficult to compute.

It is important, for many reasons, to know also the number of persons who have been employed in making up the stated number of days labor. In this country where men change their occupations so frequently and where work is so irregular, this is more important than in occupations and countries where the workman is employed nearly full time. We have seen the men employed at the anthracite mines of Pennsylvania almost starving, though their rates of wages were extremely high, so high indeed that they induced more men to go there than could find steady employment.

The character of the accident should be specified also in detail, such as death or injury due to falls of roof or sides, due to explosions of fire damp or coal dust, etc., and since the number of accidents, as well as the quantity of coal produced per 1,000 days' labor, will be greatly affected by the average thickness of the bed, the character of its coal and its roof, these should also be stated to render the statistics from different fields or mines comparable.

GOLD PRODUCTION IN 1899.

In the "Engineering and Mining Journal" for January 6th, 1900, we gave a table showing the gold production of the world in 1899; and we are now able to give the completed tables of production for the year as prepared for "The Mineral Industry," Volume VIII. Our readers will find, on comparing the two statements, that the total in the corrected table varies from our preliminary estimates by only one-half of 1 per cent.

To take the first of the accompanying tables, in which the production of the United States is given, we find that the total gold recovered from ores mined in the United States last year was \$70,096,021, an increase over the preceding year of \$5,013,591, or 7.7 per cent., which may be considered a very satisfactory gain. Nearly all of this gain, however, came from the mines of Colorado, Utah and Alaska, the other gold producing States being nearly stationary in their output. In Colorado the advance was in large part due to the Cripple Creek mines, although there was much activity in Gilpin County, in Leadville and other districts. In Utah the Mercur District furnished a large part of the increase; while that in Alaska was largely due to the discoveries at Cape Nome.

Colorado, as shown by the table, retained the first rank as a gold producer, furnishing about 38 per cent. of the total. California remained second, though at considerable interval, while South Dakota holds the third place, at another interval. Alaska was fourth last year, Montana holding the fifth place and Utah the sixth.

In addition to the gold production from our own ores, there was purchased or refined in the United States from foreign—chiefly Mexican and Canadian—ores and bullion a further amount of \$29,422,691; making the total amount of gold refined and put into marketable form by our smelters and refiners \$99,518,712. This is an increase of \$12,411,322 over the corresponding total for 1898.

The larger table gives the gold production of the world, and from this we ascertain that the total output of the yellow metal last year was \$312,307,819, an increase over 1898 of \$25,504,357, or 8.9 per cent. The growth in gold production has now continued for several years, and apparently is not yet at an end.

The year showed some changes, not all of which were expected. Australasia took the first place as a producer, the Transvaal being second and the United States dropping to the third place. Russia again held the fourth place, but Canada has risen to the fifth, its total very nearly approaching that of the Russian Empire. This gain was, of course, due to the development of the Yukon District, and, in lesser degree, to the large amount furnished by the placers of the Atlin country.

The Transvaal would undoubtedly have held the first position and would have reported some \$95,000,000 for the year, had it not been for the outbreak of the war which so suddenly put a stop to the operation of the mines. This was, indeed, the most striking incident of the year, for it has never before happened in the world's history that hostilities between two nations have affected a great gold producing district. The Witwatersrand gold deposits are in many respects unlike all others ever discovered or worked; and this dissimilarity seems to extend to their history also.

The five countries above named—Australasia, the South African Republic, the United States, Russia and Canada—together furnished a total of \$267,276,399, or 85.6 per cent. of the entire supply.

In the nations which we may consider producers of the second rank we find in the order named, Mexico, India and China. In Mexico production is increasing, as miners and prospectors are turning their attention more and more to gold instead of silver. In India gold mining is confined to a limited district, but that has shown for years past a steady growth. In China the most important gold-bearing region is just beginning to be opened by Russian influence, and it is altogether probable that a few years may see the country take its place among the great producers.

The total production of the world in 1900 will be smaller than in 1899, owing to the temporary elimination of the Transvaal from the list of producers; for it is reasonably certain that the mines cannot be brought back to full productive work for several months after the close of the war, a loss of over one-half the year. Apart from this check, however, we believe that the production of gold may be expected to increase steadily for a number of years to come owing to the following causes: (1) Enlargement of existing plants; (2) discovery of new gold-fields; (3) discovery of new deposits in old districts; (4) development of low-grade mines discovered in the past, but unworked because of high cost, though now worked owing to better and cheaper processes, cheaper material and transportation; (5) working of placer deposits with steam shovels and dredges; (6) increased production of copper and other ores carrying gold. The exhaustion of old mines is probably more than offset by the ability to mine cheaply at much greater depth.

The disposition of the gold won was very fully discussed in the "En-

Engineering and Mining Journal," February 3d, 1900, page 132; and we have seen no reason to change the views then expressed.

SILVER PRODUCTION IN 1899.

In the accompanying tables we give first the production of silver in the United States in detail; and second the production of silver in the

and the more active working of others. In Utah, which is third in order, there was also a substantial increase from causes similar to those mentioned for Montana. In Idaho, which comes fourth as a producer, there was a decrease, which resulted chiefly from the labor troubles which interrupted work in the great silver-lead mines of the

Coeur d'Alenes. Taking the silver production of the world, we find that the total

PRODUCTION OF GOLD IN THE UNITED STATES.

State or Territory.	1896.		1897.		1898.		1899.	
	Fine Ounces.	Value. (a)	Fine Ounces.	Value. (a)	Fine Ounces.	Value. (a)	Fine Ounces.	Value. (a)
Alaska.....	99,444	\$2,055,700	130,624	\$2,700,000	196,430	\$2,820,000	247,944	\$5,125,000
Arizona.....	124,770	2,579,000	130,624	2,700,000	116,110	2,400,000	124,577	2,575,000
California.....	737,036	15,235,900	725,089	15,000,000	740,208	15,300,000	716,014	14,800,000
Colorado.....	719,264	14,867,871	947,249	19,579,637	1,138,584	23,534,531	1,282,471	26,508,675
Idaho.....	104,263	2,155,300	96,759	2,000,000	99,178	2,050,000	84,664	1,750,000
Michigan.....	1,800	37,200	(c)	(c)	(c)	(c)	(c)	(c)
Montana.....	209,207	4,324,700	217,534	4,496,431	253,890	5,247,913	233,127	4,819,157
Nevada.....	116,620	2,410,538	145,138	3,000,000	145,138	3,000,000	114,750	2,371,882
New Mexico.....	23,017	475,800	22,738	470,000	23,222	480,000	24,190	500,000
Oregon.....	59,313	1,226,000	65,534	1,354,593	58,892	1,216,669	61,684	1,275,000
South Dakota.....	237,978	4,919,000	256,410	5,300,000	276,730	5,720,000	280,600	5,800,000
Southern States (b).....	12,785	264,300	12,082	249,737	12,731	263,153	13,062	500,000
Utah.....	91,908	1,899,900	89,305	1,845,938	114,777	2,372,442	169,631	3,506,582
Washington.....	19,626	405,700	21,754	449,664	29,028	600,000	36,284	750,000
Other States.....	1,413	29,200	3,136	64,795	3,760	77,222	2,164	44,725
Total domestic.....	2,558,493	\$52,886,209	2,864,576	\$59,210,795	3,148,642	\$65,082,430	3,391,196	\$70,096,021
Foreign.....	409,315	8,461,023	584,983	12,091,599	1,065,532	22,024,960	1,423,449	29,422,691
Grand total.....	2,967,737	61,347,232	3,449,559	71,302,394	4,214,174	87,107,390	4,814,645	99,518,712
Total domestic—kg.....	79,576		89,092		97,933		105,471	
Total foreign—kg.....	12,731		18,194		33,142		44,274	
Grand total—kg.....	92,307		107,286		131,075		149,745	

(a) 1 oz. gold = \$20.67; 1 kg. = \$664.60. (b) South Carolina, North Carolina, Georgia and Alabama. (c) Included with other States.

GOLD PRODUCTION OF THE WORLD.

Countries.	1897.			1898.			1899.		
	Fine Ounces.	Kilo-grams.	Value.	Fine Ounces.	Kilo-grams.	Value.	Fine Ounces.	Kilo-grams.	Value.
America, North:									
United States.....	2,864,576	89,092.4	\$59,210,795	3,148,642	97,932.9	\$65,082,430	3,391,196	105,471.0	\$70,096,021
Canada.....	291,583	9,068.6	6,027,016	662,796	20,613.9	13,700,000	1,018,371	31,674.6	21,049,739
Newfoundland.....	3,000	93.3	62,010	3,000	93.3	62,010	3,000	93.3	62,010
Mexico (a).....	344,518	10,715.0	7,121,189	398,487	12,399.5	8,236,720	448,832	13,960.1	9,277,351
Central America.....	25,399	789.9	525,000	24,435	760.0	505,096	23,470	730.0	485,158
America, South:									
Argentina.....	6,661	207.0	137,700	6,661	207.0	137,700	6,661	207.0	137,700
Bolivia.....	16,617	517.0	343,500	16,617	517.0	343,500	16,617	517.0	343,500
Brazil.....	70,736	2,200.0	1,462,120	76,613	2,383.0	1,533,700	76,613	2,383.0	1,533,700
Chile (b).....	68,102	2,118.0	1,407,623	60,000	1,866.2	1,240,000	54,657	1,700.0	1,129,320
Colombia.....	188,679	5,868.2	3,900,000	179,003	5,567.3	3,700,000	164,490	5,115.9	3,400,000
Ecuador.....	6,430	199.9	132,900	1,911	59.9	39,500	1,911	59.9	39,500
Guiana (British).....	101,504	3,156.9	2,036,038	99,105	3,032.0	2,048,297	108,269	3,367.5	2,235,040
Guiana (Dutch).....	32,982	1,028.8	681,734	27,532	856.0	568,898	26,972	838.9	557,532
Guiana (French).....	59,860	1,861.7	1,237,310	79,547	2,474.0	1,644,260	80,072	2,490.5	1,650,588
Peru.....	22,506	700.0	465,220	31,572	982.0	652,593	31,829	990.0	657,905
Uruguay.....	1,863	57.9	38,506	1,863	57.9	38,506	1,863	57.9	38,506
Venezuela.....	51,152	1,591.0	1,057,379	48,226	1,500.0	996,900	46,619	1,450.0	963,670
Europe:									
Austria.....	2,174	67.6	44,927	2,299	71.5	47,520	2,299	71.5	47,520
Hungary.....	98,645	3,068.0	2,098,993	88,994	2,768.0	1,899,506	88,994	2,768.0	1,899,506
France.....	8,874	276.0	183,430	8,584	267.0	177,448	8,584	267.0	177,448
Germany (d).....	12,089	376.0	240,890	3,569	111.0	73,771	3,569	111.0	73,771
Italy.....	10,160	316.0	213,014	6,041	187.9	124,878	6,041	187.9	124,878
Norway.....	32	1.0	665	32	1.0	665	32	1.0	665
Portugal.....	537	16.7	11,098	219	6.8	4,608	219	6.8	4,608
Russia.....	1,042,017	32,408.2	21,538,490	1,196,634	37,217.0	24,734,418	1,159,214	36,056.3	23,963,017
Spain.....	1,833	57.0	37,888	1,929	60.0	39,373	1,929	60.0	39,373
Sweden.....	3,643	113.3	75,299	4,048	125.9	83,672	4,048	125.9	83,672
Turkey.....	386	12.0	7,975	375	11.6	7,751	375	11.6	7,751
United Kingdom.....	1,891	58.6	34,962	306	9.0	36,321	484	15.1	10,000
Africa:									
So. Afric'n Republic.....	2,744,010	85,342.6	56,718,679	3,777,009	117,470.3	78,070,761	3,529,826	109,782.6	72,961,501
Rhodesia.....	Nil.	Nil.	Nil.	20,981	652.5	433,682	54,241	1,687.0	1,121,170
Soudan.....	2,701	84.0	55,830	2,701	84.0	55,830	2,701	84.0	55,830
West Coast.....	48,363	1,504.1	999,653	34,845	1,083.7	730,248	33,865	1,053.3	700,000
Madagascar.....	19,351	601.9	400,000	3,151	98.0	65,110	3,151	98.0	65,110
Asia:									
Borneo.....	5,369	167.0	110,977	5,369	167.0	110,977	5,369	167.0	110,977
China.....	321,286	9,992.8	6,641,190	321,286	9,992.8	6,641,190	321,510	10,000.0	6,645,612
India (British).....	383,147	10,983.4	7,939,554	375,704	11,684.9	7,765,807	405,683	12,618.2	8,385,467
Japan.....	34,509	1,073.3	713,300	38,260	1,190.0	790,826	58,065	1,806.6	1,200,000
Korea.....	52,927	1,646.1	1,094,000	55,432	1,724.0	1,145,769	55,432	1,724.0	1,145,769
Malay Peninsula.....	25,000	777.5	516,750	25,000	777.5	516,750	25,399	790.0	524,997
Australasia, 7 cols.....	2,539,491	78,981.8	52,491,379	3,013,763	93,732.3	62,294,481	3,831,937	119,185.6	79,206,130
Other countries (f).....	21,771	677.1	450,000	21,771	677.1	450,000	24,190	752.4	500,000
Totals.....	11,506,064	357,852.2	\$237,833,984	13,874,322	431,515.8	\$286,808,462	15,108,804	469,929.9	\$312,307,819

(a) Figures are based on exports of ores, matte, etc., and coinage. (b) Computed from exports. (c) As reported by the Statistique de l'Industrie Minerale, 1899. (d) The statistics have been changed in the present volume so as to represent the production from domestic sources. The statistics given in former volumes represented the production of refineries. The output by refineries in 1899 was 2,605 kg. (e) Estimated. In all cases, unless specified to the contrary, the figures have been taken from official sources or have been collected by THE MINERAL INDUSTRY, directly from the producers. (f) Comprises Abyssinia, Servia, Persia, Dutch East Indies, Formosa, and Philippine Islands.

world. The figures given are those collected and prepared for "The Mineral Industry," Volume VIII.

In the United States the total production showed a small increase—371,802 ounces, or 0.7 per cent.—over 1898, but was less by 1,361,976 ounces, or 2.3 per cent., than in 1897. There were no features in the year's production to call for special comment. Colorado remained the leading silver producer, though the output of the State showed a small decrease. In Montana, the second producer in importance, there was a considerable gain, due to the reopening of several important mines

reached in 1899 was 174,723,363 ounces, or 5,434,353 kilograms; a decrease, as compared with 1898, of 4,528,999 ounces, or 2.5 per cent. This is a very small change, and shows that silver production for the present is practically constant.

We have frequently referred heretofore to the reasons for the continued large output of silver, notwithstanding the apprehensions which were entertained a few years ago. The large proportion of silver produced in connection with other metals, such as lead and copper, tends to keep up the output; while the steadily increasing demand for the

metal for use in the arts serves to maintain the consumption at a level not far from that of production. Stocks do not accumulate, and that there is not an over-supply is shown by the fact that the average price of the metal in 1899 was 59.58 cents an ounce, or 1.32 cents higher than in 1898.

As to the leading producers, we find that in 1899 the United States recovered the lead which in 1898 was lost, and was taken by Mexico, the difference, however, being only 105,044 ounces only. In 1899 the Mexican production declined, and the total was 2,093,996 ounces less than that of the United States. These two countries produced together in 1899 a total of 112,159,672 ounces of silver, or 64.2 per cent. of the world's production.

No other country approaches either of the two leaders. The third country in production is Australasia, where the output of silver is nearly

UNITED STATES COAL PRODUCTION IN 1899.

In the "Engineering and Mining Journal" for January 6th last we gave the estimated output of coal in the United States for the year 1899, and stated that for the first time Great Britain was forced to take second place and the United States led the world. Our estimate was from returns received to that date and could not include the closing months of the year, while our knowledge of England's output was even less complete. The final figures, however, which we now publish, as prepared for the "Mineral Industry," Vol. VIII, show the wonderful gain in production in this country and fully confirm our statement that Great Britain had taken second place. The production of coal in the United States in 1899 was 252,115,337 short tons (228,717,579 metric tons), the largest yet recorded for any country in the world. The increase.

PRODUCTION OF SILVER IN THE UNITED STATES.

State or Territory.	1896.		1897.		1898.		1899.	
	Troy Ounces.	Commercial Value. (a)	Troy Ounces.	Commercial Value. (a)	Troy Ounces.	Commercial Value. (a)	Troy Ounces.	Commercial Value. (a)
Alaska.....	150,000	\$100,650	250,000	\$149,475	150,000	\$87,390	275,000	\$163,845
Arizona.....	2,000,000	1,842,000	1,332,232	796,577	2,250,000	1,310,850	2,000,000	1,191,600
California....	600,000	402,600	757,309	452,790	650,000	375,690	600,000	357,480
Colorado.....	22,500,000	15,097,500	21,275,202	12,732,227	23,502,801	13,692,515	23,114,688	13,771,731
Idaho.....	5,400,000	3,625,400	6,000,000	3,587,400	6,284,744	3,661,492	4,800,000	2,859,840
Montana.....	15,790,000	10,548,120	16,807,346	10,049,112	14,818,662	8,633,352	16,850,755	10,039,680
Nevada.....	1,200,000	805,200	1,500,000	896,850	800,000	466,080	575,000	342,585
New Mexico....	700,000	469,700	350,000	209,265	450,000	262,170	425,000	253,215
Oregon.....	61,100	40,998	84,802	50,703	128,326	74,763	140,000	83,412
South Dakota...	450,000	301,950	500,000	298,950	325,000	189,345	350,000	208,530
Texas.....	525,400	352,543	600,000	358,740	500,000	291,300	450,000	268,110
Utah.....	8,842,810	5,933,526	6,689,754	3,999,804	6,570,256	3,827,773	7,183,107	4,279,695
Washington....	274,900	184,458	242,781	145,159	275,000	160,215	300,000	178,740
Others.....	64,600	43,347	64,815	38,753	50,443	29,388	63,284	37,705
Totals...	58,488,810	\$39,245,992	56,457,292	\$33,755,815	56,755,032	\$33,065,482	57,126,834	\$34,336,168

(a) The average value in 1896 was 67.1c. per oz., 59.79c. in 1897, 58.26c. in 1898, and 59.58c. in 1899.

SILVER PRODUCTION OF THE WORLD. (a)

Countries.	1898.			1899.		
	Troy Ounces.	Kilograms.	Commercial Value.	Troy Ounces.	Kilograms.	Commercial Value.
America, North:						
United States.....	56,755,032	1,765,264.9	\$33,065,482	57,126,834	1,776,829.1	\$34,036,168
Canada.....	4,484,085	137,919.3	2,616,110	3,078,837	95,761.8	1,834,371
Mexico (a).....	50,859,076	1,768,501.0	33,546,855	55,032,838	1,711,639.1	32,788,565
Central America.....	1,633,575	e 50,500.0	957,909	1,446,795	e 45,000.0	862,001
America, South:						
Argentina.....	383,561	e 11,980.0	226,301	383,561	e 11,980.0	226,526
Bolivia.....	10,432,685	e 324,490.4	6,155,084	10,432,685	324,490.4	6,215,784
Chile (b).....	5,829,542	181,318.2	3,439,430	5,772,791	179,552.4	3,439,430
Colombia.....	1,646,131	e 51,200.0	971,217	1,646,131	e 51,200.0	980,764
Ecuador.....	8,100	e 251.9	4,779	8,100	e 251.9	4,826
Peru (a).....	5,781,532	179,824.0	3,411,116	5,725,270	e 178,074.4	3,411,116
Europe:						
Austria.....	1,295,843	40,304.9	764,347	1,295,843	e 40,304.9	772,068
Hungary.....	604,407	18,799.0	256,600	604,407	e 18,799.0	300,106
France.....	461,045	14,340.0	272,017	461,045	e 14,340.0	274,690
Germany (c).....	5,572,701	173,329.0	3,287,893	5,572,701	e 173,329.0	3,320,215
Greece.....	1,303,136	40,533.0	768,850	1,304,917	40,376.1	771,512
Italy.....	1,396,556	43,437.4	823,968	1,396,556	e 43,437.4	832,068
Norway.....	172,515	5,372.0	101,784	172,515	e 5,330.0	102,784
Portugal.....	3,842	119.5	2,367	3,842	e 119.5	2,367
Russia.....	278,515	8,663.0	164,324	260,809	8,112.0	155,390
Servia.....	18,326	570.0	10,812	18,326	e 570.0	10,919
Sweden.....	7,362,579	229,000.0	4,343,922	5,448,019	169,451.0	3,245,930
Turkey.....	65,363					
Turkey.....	225,282	2,083.0	38,563	65,363	e 2,083.0	38,943
United Kingdom.....	211,393	7,007.0	132,916	225,282	e 7,007.0	134,223
Asia:						
Dutch East Indies.....	1,286	40.0	759	1,286	e 40.0	766
Japan.....	1,660,213	51,638.0	979,326	1,660,213	e 51,638.0	980,154
Australasia.....	14,817,795	460,881.0	8,742,499	15,326,768	476,712.0	9,131,688
Other countries (d).....	48,226	e 1,500.0	28,453	48,226	e 1,500.0	28,733
Totals.....	179,252,362	5,575,835.5	\$105,364,505	174,723,363	5,434,353.0	\$104,100,163

(a) Statistics compiled from exports and coinage. (b) Represents exports of silver in all forms. (c) The figures are for silver produced from domestic ores only. The output as reported in former volumes of THE MINERAL INDUSTRY represents the total output by refineries. In 1899 this amounted to 467,593 kg. (d) The output is mostly from China and Persia. (e) Estimated. Unless specified to the contrary, the statistics have been taken from official sources or have been collected directly from the producers by THE MINERAL INDUSTRY.

all in conjunction with lead, as at Broken Hill in New South Wales, or with copper, as at Mount Lyell in Tasmania. Fourth in order we find Bolivia, where silver mining is the most important industry of the country. In most of the countries of secondary importance we find little change. Chile and Peru, in South America, and Germany, where much of the silver is won from imported ores, show but little change. In Spain, however, there was a large decrease, which was the result of a reduced output of lead.

We have heretofore—in the "Engineering and Mining Journal," March 3d last, page 252—considered the disposal of the silver produced, and it was then shown that at least 55 per cent. of the silver produced was absorbed by China and India. The greater part of the remainder must have been used in the arts, leaving only a very small addition to the available or commercial stock.

As hinted above, we do not anticipate any considerable changes in production, and the silver output of 1900 will vary little, in either direction, from that which we have recorded for 1899.

compared with 1898, was 33,231,504 tons, or 15.2 per cent. The production of the United Kingdom was 220,085,303 long tons (223,606,668 metric tons), an increase of 18,043,060 long tons, or 9.4 per cent., over 1898. The United States leads, consequently, by 5,110,611 metric tons.

In the accompanying table we present in detail the figures by States, as compared with 1898. It will be seen that of the 1899 production in this country 191,501,350 short tons, or 76 per cent. of the total, were bituminous; 60,557,398 short tons, or 24 per cent., anthracite, and the remaining 36,639 tons, or less than 0.02 per cent., Kentucky cannel coal. The remarkable increase in output over 1898 shows very strikingly the flood of industrial prosperity that began to rise in 1898 and the consequent demand for fuel.

In the accompanying table the price per ton given is the average of that prevailing during the year at the mines. It will be seen that Pennsylvania easily maintained her great supremacy among the States as a coal producer, the year's output, including both anthracite and bituminous, being 133,624,341 short tons, or 53 per cent. of the total, a gain

of 16,527,877 tons over 1898. Illinois remains second with a production of 23,434,445 short tons, a gain of 4,835,236 tons over 1898, and West Virginia third with 18,201,189 short tons, a gain of 1,701,349 tons.

As coal production shows the general industrial activity, so coke production, a barometer of the iron trade, shows that our ironmasters had in 1899 a very busy and profitable year. The total output of coke was 18,025,256 short tons (16,352,405 metric tons), compared with 15,938,556 short tons in 1898, a gain of 2,086,700 short tons, or 13.1 per cent. The Connellsville Region places Pennsylvania still without the semblance of a rival as a coke producer, that State making 12,192,570 tons,

BOOKS RECEIVED.

In sending books for notices 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.

"Les Plaques de Blindages." By L. Bacle. Paris, France; Veuve Ch. Dunod. Pages, 234; illustrated. Price (in New York), \$3.50.

North Carolina Geological Survey. "Talc and Pyrophyllite Deposits in North Carolina." By Joseph Hyde Pratt. Raleigh, N. C.; State Printers. Pages, 30; with maps.

"Annual Statistical Report of the American Iron and Steel Association

TOTAL PRODUCTION OF COAL IN THE UNITED STATES. (IN TONS OF 2,000 LB.)

States.	1898.			1899.		
	Tons.	Value at Mine.		Tons.	Value at Mine.	
		Total.	Per Ton.		Total.	Per Ton.
Bituminous:						
Alabama.....	6,466,741	\$5,496,730	\$0.85	7,484,763	\$7,484,763	\$1.00
Alaska (b).....	1,300	6,825	5.25	2,300	12,282	5.34
Arkansas.....	1,134,064	1,202,108	1.06	1,233,743	1,233,553	1.35
California.....	135,795	334,999	2.47	167,161	430,631	2.58
Colorado.....	4,125,206	7,219,110	1.75	4,747,812	8,308,671	1.75
Georgia.....	240,000	156,455	0.65	203,775	188,061	0.90
Illinois.....	23,434,445	14,567,598	0.78	23,434,445	18,443,946	0.78
Indiana.....	5,435,896	4,729,230	0.87	6,158,224	5,542,402	0.90
Indian Territory.....	1,458,098	1,822,622	1.25	1,404,442	2,106,663	1.50
Iowa.....	4,117,359	4,759,967	1.16	4,675,000	5,987,350	1.27
Kansas.....	3,860,405	4,193,160	1.09	4,096,895	5,124,248	1.25
Kentucky.....	3,492,243	2,473,493	0.71	4,688,800	3,720,100	0.80
Maryland.....	4,621,618	3,143,700	0.68	5,080,248	4,318,211	0.85
Michigan.....	378,541	560,241	1.48	500,000	720,000	1.44
Missouri.....	2,838,152	3,148,862	1.10	3,191,811	3,582,111	1.12
Montana.....	1,450,971	2,180,390	1.50	1,409,832	2,227,998	1.58
Nebraska.....	500	1,750	3.50	1,000	3,000	3.00
New Mexico.....	283,583	1,416,890	1.64	1,049,034	1,600,588	1.52
North Carolina.....	6,144	8,602	1.40	26,994	37,792	1.40
North Dakota (b).....	124,526	124,526	1.00	120,597	120,597	1.00
Ohio.....	14,053,829	10,680,910	0.76	16,695,949	14,191,557	0.85
Oregon.....	65,871	183,543	2.79	86,886	232,854	2.68
Pennsylvania.....	64,247,859	38,548,715	0.60	73,066,943	57,722,885	0.79
Tennessee.....	3,084,748	2,340,346	0.76	3,736,134	3,706,617	0.99
Texas (c).....	751,191	1,141,810	1.52	940,622	1,646,088	1.75
Utah.....	571,417	583,084	1.02	882,496	1,563,193	1.76
Virginia.....	1,640,000	984,000	0.60	2,111,391	1,372,404	0.65
Washington (d).....	1,988,288	3,301,978	1.66	1,917,607	3,355,812	1.75
West Virginia.....	16,499,840	9,715,754	0.59	18,201,189	11,830,773	0.65
Wyoming.....	3,181,905	4,006,756	1.26	4,525,207	5,656,509	1.25
Total bituminous } Sh. tons... 165,435,389	\$129,032,154	\$0.78	191,501,350	\$172,406,679	\$0.90	
} Met. tons... 150,082,000		0.86	173,728,885		0.99	
Cannel:						
Kentucky..... } Sh. tons... 49,889	\$134,700	\$2.70	36,639	\$91,597	\$2.50	
} Met. tons... 45,259		2.98	33,239		2.76	
Anthracite:						
Colorado.....	48,831	\$134,285	\$2.75	59,067	\$162,434	\$2.75
Pennsylvania.....	52,799,774	81,311,652	1.54	60,518,331	103,486,346	1.71
Total anthracite.. } Sh. tons... 52,848,605	\$81,445,937	\$1.54	60,577,398	\$103,648,780	\$1.71	
} Met. tons... 47,943,940		1.70	54,955,455		1.89	
Grand total coal } Sh. tons... 218,333,883	\$210,619,791	\$0.96	252,115,387	\$276,147,056	\$1.10	
} Met. tons... 198,071,199		1.06	223,717,579		1.21	

(a) Fiscal year. (b) All lignite. (c) One-third lignite. (d) One-half lignite.

TOTAL PRODUCTION OF COKE IN THE UNITED STATES. (IN TONS OF 2,000 LB.)

States.	1898.			1899.		
	Tons.	Value at Oven.		Tons.	Value at Oven.	
		Total.	Per Ton.		Total.	Per Ton.
Alabama.....	1,541,250	\$3,082,500	\$2.00	1,791,612	\$4,676,391	\$2.60
Colorado.....	445,925	1,226,294	2.75	455,783	1,253,403	2.75
Georgia.....	50,000	63,500	1.27	44,529	92,748	2.08
Illinois.....	3,000	4,350	1.45	2,000	3,300	1.65
Indiana.....	1,521	2,662	1.75	2,105	4,105	1.95
Indian Territory.....	34,310	78,323	2.28	29,362	65,426	2.23
Kansas.....	10,000	30,000	3.00	20,000	60,000	3.00
Kentucky.....	21,394	30,593	1.43	55,580	79,301	1.42
Missouri.....	5,440	10,709	1.97	4,560	8,803	1.93
Montana.....	70,235	529,825	7.54	59,072	401,779	6.80
New Mexico.....	2,275	5,119	2.25	33,661	110,046	3.27
Ohio.....	100,000	250,000	2.50	73,391	183,477	2.50
Pennsylvania.....	10,671,920	21,663,938	2.03	12,192,570	29,871,796	2.45
Tennessee.....	394,545	710,181	1.80	440,157	864,073	1.91
Utah.....	28,327	127,809	4.51	26,700	122,820	4.60
Virginia.....	525,000	703,500	1.34	555,507	1,027,688	1.85
Washington.....	62,720	219,520	3.50	31,233	117,311	3.75
West Virginia (b).....	1,951,801	2,315,822	1.19	2,004,405	2,512,709	1.25
Wyoming.....	18,393	64,375	3.50	15,979	55,926	3.50
Total coke } Sh. tons... 15,938,556	\$31,100,680	\$1.95	18,025,256	\$42,081,002	\$2.33	
} Met. tons... 14,459,363		2.15	16,352,405		2.57	

(a) Fiscal year. (b) Includes 35,319 tons (\$131,033) made in Wisconsin in 1898, and 40,537 tons (\$156,067) in 1899.

or 67.1 per cent. of the total output. The values given are the average of those prevailing at the ovens during the year.

As was to be expected in a year of intense activity in all lines of industry, the output of the coal mines was needed to supply the domestic market, the mines in some fields being utterly unable to supply demand during the last half of the year. As a result, in spite of increased inquiries from abroad, exports of coal and coke were but moderate. The total exports were 1,707,796 long tons of anthracite coal, practically all of which went to Canada, and 4,044,354 long tons of bituminous, much of which went to South American or West Indian ports or to supply the needs of our fleet in distant waters. The exports of coke were but 280,196 tons, most of this going to Canada and Mexico.

for 1899." Prepared by James M. Swank, General Manager. Philadelphia; published by the Association. Pages, 77. Price, \$3.

"Elektrometallurgie und Galvano-Technik." By Dr. Franz Peters. Vienna, Austria; A. Hartleben. In four parts, containing in all 1,000 pages and 283 illustrations. Price (in New York), \$4, paper; \$5.50 bound.

COAL CONTRACTS IN GERMANY.—The new contract made between the Prussian State Railway Administration and the Rhenish-Westphalian Coal Syndicate, that will come into force on July 1st, covers 2,234,620 tons, including gas coal 30,000 tons, bituminous 2,285,820 tons, and non-bituminous 18,800 tons. The price agreed upon is \$2.64 per ton at the pit mouth, while in the current contracts the prices run from \$2.28 to \$2.50 per ton.

NATHANIEL P. HILL.

Nathaniel Peter Hill, whose death in Denver on May 22d, was briefly noted in our columns last week, was for over 30 years one of the leading men of Colorado. His ability and standing as a metallurgist and as a sound and reliable man of business gave him a position held by few, and leave a place that will not readily be filled.

Mr. Hill was born in 1832, in Orange County, New York, where his father owned a large farm. At the age of 16 he was left in charge of the estate and thus gained some valuable business experience. Although busily employed, he found time to prepare himself for college, and in 1853 entered Brown University at Providence, R. I., where he graduated in 1856. He gave especial attention to chemistry, and after graduating was appointed tutor in that department. In 1860 he was appointed professor of chemistry at the University. He gained such a reputation as a scientist that a number of Boston and Providence gentlemen placed at his disposal a sufficient sum to enable him to make a thorough examination of the Gilpin land grant in Colorado.

He made a visit to the territory, and in the following year a second for the purpose of making a complete and exhaustive examination of the mines of Gilpin County. It was during these visits that his attention was attracted to the imperfect method of treating the ores of that region. He decided that some more economical method was necessary, and set about to discover and apply it. For that purpose he visited the reduction works at Swansea, Wales, and at Freiberg in Germany,



NATHANIEL P. HILL.

having first resigned his professorship at Brown. He spent some months studying the methods of ore reduction in Europe and in 1866 made a second voyage to Europe, taking with him 70 tons of Colorado ore for treatment at Swansea. Returning in the spring of 1867, he organized the Boston & Colorado Smelting Company, and had since devoted his energies to its successful management. The works were constructed at Black Hawk first and remained there for a number of years. The peculiar method employed in the smelter is designed for the class of ores mined in the Clear Creek Region. In 1878 the smelter was removed to its present location at Argo. It has since been in operation without intermission.

While looking after the interests of the Argo smelter, Mr. Hill was becoming interested in other ventures. He obtained possession of a large tract of land in the vicinity of Florence, on which oil was subsequently discovered. He organized the United Oil Company and made it one of the big concerns of the State. His interest in that alone would be considered a fortune. Later he became a four-fifths owner of the Denver "Republican." To this he had not given the personal attention he gave to his other business enterprises, but he endeavored to place it on a high plane as a conservative journal.

Mr. Hill's political career began in 1879, when he was brought out as a Republican candidate for United States Senator. He was successful and served six years in Congress. He was defeated for re-election. His career as senator was a highly creditable one both to himself and to his State. His opinions always commanded respect in the Senate, and he was consulted on important financial and economic questions. After his retirement from the Senate he held no public office, except to serve for a short time as a member of the International Monetary Commission. One of his favorite projects, which he advocated actively while in the Senate, and afterward, was the establishment of a postal telegraph by the Government. He was an active opponent of fraud in every form.

Senator Hill leaves a wife and three children. Crawford Hill, the son, has been in the office with his father for many years and is familiar with the business, which will probably now devolve upon him. He has

practically conducted it for the past two or three years. Mrs. Charles B. Berger and Miss Isabel Hill are the other children.

HENRY B. C. NITZE.

Henry B. C. Nitze, one of the most promising and best known of our younger mining engineers, died suddenly on May 25th at Rico, Colorado. He was stricken with heart disease while engaged with his professional duties, and up to within 48 hours of his death he was busily at work.

Mr. Nitze was born in Baltimore, Md., on April 19th, 1867, where he received his early education. In 1883 he entered Lehigh University, and in 1887 graduated as B. S. A little later he received his degree as engineer of mines, and almost immediately took up active work in the field, first going West to Utah and Montana, where he was connected with several companies as assayer and chemist. In 1890, when the boom days were on in the South, he went to Birmingham, Alabama. From this time until the summer of 1896 he was engaged in expert geological and mining work in various sections of the South, and was also connected with the North Carolina Survey, as assistant State geologist. As early as 1893 he contributed to the North Carolina Survey a monograph entitled "Iron Ores of North Carolina." Shortly afterward he studied the monazite deposits in this State, and in 1895 the Survey published a bulletin by him on "Monazite and Monazite Deposits of North Carolina."

His attention was then turned to the gold bearing deposits of the Appalachian States, and in 1896 the Survey issued a bulletin by Mr. Nitze and Mr. George B. Hanna on the "Gold Deposits of North Carolina." Probably his best work in recent years was that which he and Mr. H. A. J. Wilkens did in making a thorough examination of the gold



HENRY B. C. NITZE.

mines of the Appalachian Region. Their observations and researches were published preliminarily in the "Transactions" of the American Institute of Mining Engineers, and later in an elaborate report on "Gold Mining in North Carolina and other Appalachian States," which appeared in 1897 as a bulletin of the North Carolina Geological Survey. Mr. Nitze, while employed by the Survey, also did important work in other branches of the mineral industry of North Carolina.

In the fall of 1896 and until the summer of 1897 Mr. Nitze was connected with the Wetherill Concentrating Company. During this time he made a thorough study of the Wetherill process, and wrote much on the subject. Among the papers may be mentioned one which he submitted at a meeting of the Franklin Institute in Philadelphia, in April, 1897, entitled "The Wetherill Magnetic Concentrating Process," which was later printed in pamphlet form. Shortly afterward he became a member of the International Geological Congress and attended the seventh meeting in St. Petersburg, Russia, in the summer of 1897. His observations of gold mining in the Urals were embodied in his article on "The Gold Placers of the Eastern Oural Mountains, Russia," which appeared in the "Engineering and Mining Journal," September 10th, 1898. While abroad Mr. Nitze traveled extensively, making a careful study of the mining industry in the various regions visited by members of the Congress. In the spring of 1898 he again took up his professional work in America, and since then had also been connected with the United States Geological Survey as an expert. Among his latter contributions to literature may be mentioned his monograph on "Investigations of Some of the Mineral Resources of Porto Rico," which was published in 1899. At various times he also wrote articles on Southern mining interests, and was quoted as an authority on these subjects. He was a frequent contributor to the columns of the "Engineering and Mining Journal."

As a mining expert he was closely connected with the Maryland Steel Company, for whom he examined a number of mineral properties. For the past six months and up to the time of his death he had been general mining and geological expert for the New Jersey Zinc Company, and it was while in the service of that company that he died in Colorado.

He was a member of the American Institute of Mining Engineers and other scientific bodies. As a companion he was most agreeable, and ranked high in his profession. His many friends and acquaintances will much regret his sudden demise, which cuts short a career of great promise.

NOTES ON LEAD SMELTING AND GOLD AND SILVER REFINING.*
APPARATUS FOR COLLECTING SOLIDS FROM SMOKE.

Written for the Engineering and Mining Journal by Malvern W. Iles.

During the past 19 years I have been deeply interested in the study of the metallurgic smoke and fume which are produced by the fire treatment of gold, silver, lead and copper ores. I have made a great many qualitative and quantitative experiments in the collection of the various kinds of solid matter which is found both in the smoke and fume arising from the great variety of blast furnaces, roasting furnaces, fusing furnaces, and indeed all of the great many types of furnaces known to the lead smelter's art. Analyses of the solids in smoke will be found in the columns of the "Engineering and Mining Journal," and also in "The School of Mines Quarterly" of Columbia University, covering a period from 1880 up to 1900. I have used a great many different kinds of apparatus in my experiments, but wish now to briefly describe the particular form which I like best, and upon which I think gives the most trustworthy information.

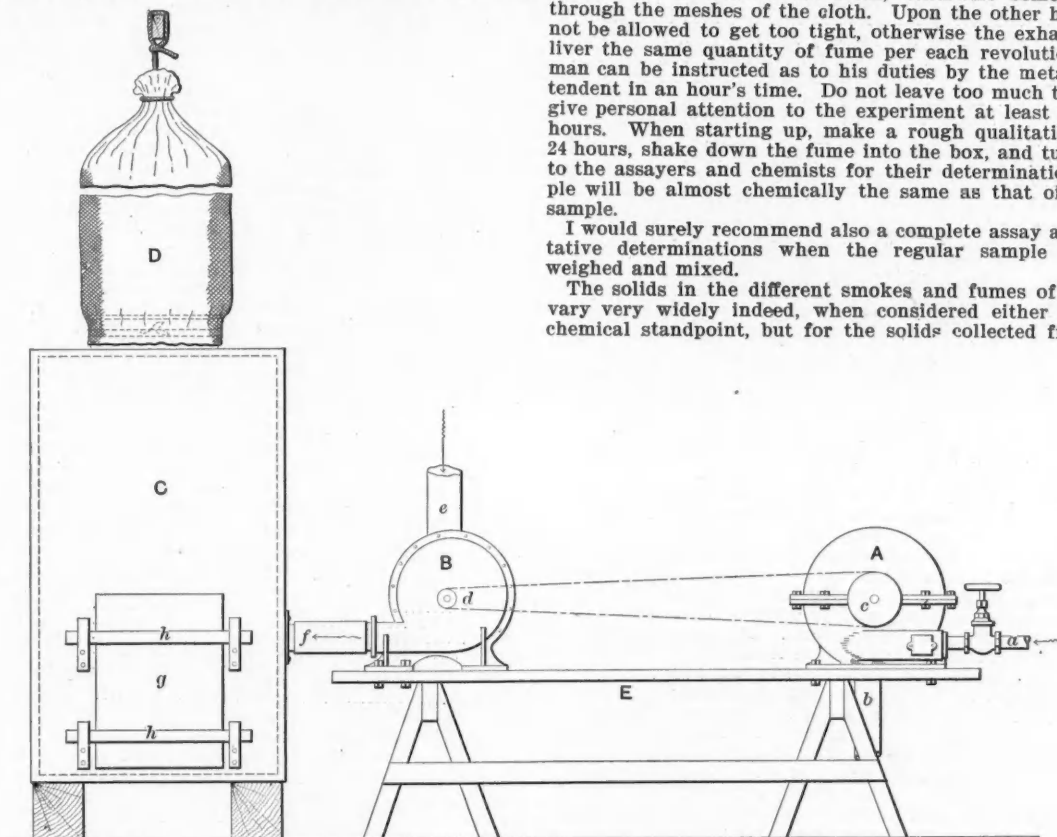
I have used a great many different kinds of aspirators, and when these experiments are repeated a great many times, and for a long

D is a bag (which may be either muslin or flannel) having a circumference of 60 in. and about 20 ft. long, made preferably of plain woven cotton cloth having from 44 to 50 threads in the weft, likewise the woof, in ever square inch of surface.

If the fume to be filtered is very hot, say over 250° F., this bag should be made of flannel, at least the lower end, for a distance of 3 ft. It is very necessary to keep the pressure of the water at a fixed point, say 40 lbs. per square inch, or even 50 lbs. if it be the practice to keep this as the standard pressure at the works. I, however, find for industrial plants 40 lbs. to be quite sufficient for almost all purposes; but the steam valve upon the pump should be a quick-acting one, and there should be placed at some convenient place upon the wall of the pump house a large-faced pressure gauge, with an electric light bulb placed near thereto, for accurate and quick reading of the pressure registration upon the gauge at night. When the experiment is started a good intelligent man should be placed at the apparatus described, who works 12 hours, and is relieved by another man who also works 12 hours. It will be the very easy duty of these men simply to watch the pressure of the water gauge, keeping the pressure constant, and every one or two hours to shake the bag very lightly, if necessary; but the bag should not be shaken too often, otherwise some fume will be lost through the meshes of the cloth. Upon the other hand, the bag should not be allowed to get too tight, otherwise the exhaust fan will not deliver the same quantity of fume per each revolution. Any intelligent man can be instructed as to his duties by the metallurgist or superintendent in an hour's time. Do not leave too much to the attendant, but give personal attention to the experiment at least three times each 24 hours. When starting up, make a rough qualitative test for the first 24 hours, shake down the fume into the box, and turn over this sample to the assayers and chemists for their determinations, since this sample will be almost chemically the same as that of the main or large sample.

I would surely recommend also a complete assay and chemical quantitative determinations when the regular sample has been properly weighed and mixed.

The solids in the different smokes and fumes of an industrial plant vary very widely indeed, when considered either from a physical or chemical standpoint, but for the solids collected from the smoke and



APPARATUS FOR COLLECTING SOLID MATTER FROM SMOKE.

period, say for 10 days, or two weeks, we can arrive at a very satisfactory answer to our question of how many dollars are lost per year in a certain kind of smoke. I have also used exhaust fans propelled both by belting from a line shaft and from an electric motor. I prefer, however, to use water as the motive power, and in the following manner: By referring to the drawing, the letter A represents a water motor, say a No. 2 Pelton wheel having a 12-in. water wheel and developing about 1 H.-P., under 40 lbs. water pressure.

The pump at the pump house should be supplied with an accurate pressure gauge, and to the water pipe which actuates the water wheel there should be attached also a good water-pressure gauge, which is placed close to the wheel; and it is best to check up this gauge with the one stationed at the pump house.

Upon the drawing, a is the water inlet, and b represents the water discharge pipe, while c shows an 8-in. pulley with a face of 2½ in. B represents a No. 00 "Monogram" blower, manufactured by the B. F. Sturtevant Company of Boston, Mass. At e is shown the suction to the fan, which is 4½ in. in diameter, while f is the discharge, which is 4½ in. in diameter. The pulley upon the blower (or really the exhaust fan in this case) is shown by d; this pulley is 2½ in. in diameter, and has a face 2½ in. wide. C represents a box made of heavy IX bright tin; this box is 3 ft. square and 5 ft. high; g is a door into the box about 18 in. wide, and 2 ft. high, held in place by two bars of iron, h, which in turn are held into place by the lags, i, which are so fashioned that as the bars, h, are driven down they press firmly against the door, holding it firmly against the box. There is a thimble for the reception of the pipe, f, which is 18 in. above the floor of the box to the bottom of the thimble. There is also a thimble in the center of the top of the box. This thimble is 18 in. in diameter and 12 in. long, ending with a roll projecting outward around a ¼-in. rod.

The box is built upon 1½ in. angle iron for a framework, with two stiffeners of the same material carried around the box, one at the top of the door, and one midway between that and the top.

fume at a lead smelter I prefer to have the following tests made: Assay for silver, lead and gold, and the chemists will determine the specific gravity, and determine quantitatively the silica, iron, manganese, lime, barium, magnesium, alumina, zinc, potash, soda, ammonia, lead, copper, carbon, the total sulphur, and how much sulphur exists as a sulphide, how much as a sulphate, and the free sulphuric acid. When possible make a spectroscopic determination of these solids, and perform physical tests of many kinds; for example, see if it mixes with boiled linseed oil, and try it for paint purposes; see how it acts under high pressure; try to burn it in a great many different ways, as some of these solids manifest features when ignited which can be turned to commercial profit.

By noting the diameter of the pulleys, the size of the inlet and discharge pipes, we arrive at the number of cubic feet of gaseous matter removed from the stack, flue, chamber or smoke conduit pipe.

The experiment should last at least a week, and keep on until concordant results are obtained. It is my firm belief that all smoke and fume from all industrial plants should be carefully tested quantitatively in order to determine the losses of solids sustained per year, and to see if these solids can not be made a source of income to the works.

BELGIAN COAL SUPPLY.—The Rhenish-Westphalian Coal Syndicate, says the London "Colliery Guardian," has given notice to its Belgian customers that at the expiration of the contracts now running they will only be renewed with a reduction of 25 per cent. on the quantities. These customers are in a difficult position, because, when they turn to their own country for completing their supplies, they find that there are no stocks, while it is almost certain (observes a circular of the Comité Central des Houillères de France) that the present production cannot be increased. This is entirely due to insufficiency of labor, or, at any rate, to insufficiency in its results, as the custom of making Monday a play day, to say nothing of other days in the week, is gaining ground, and the useful effect of the workmen is diminishing in all the colliery districts.

THE MISSOURI LEAD AND ZINC COMPANY'S PLANT.

By Our Special Correspondent.

The Missouri Lead & Zinc Company is probably the most important mining company doing business in the Missouri-Kansas zinc and lead mining district. The company possesses the largest capital of any company in the district and also the greatest acreage of developed mining lands; and its operations are on a scale of greater magnitude, and in some respects far ahead of anything in the district. The permanent character and the great cost of the improvements made by the company on its lands indicate faith in the permanency of mining operations in Southwest Missouri and the success of the methods of operation is becoming more apparent every day. The company is capitalized for \$3,000,000, and the officers are Alexander Ross, president; John Butler, vice-president; W. F. Reed, secretary and treasurer, all of St. Louis; and H. R. Conklin of Joplin, superintendent.

The company owns the fee of 1,300 acres of land, most of which lies within or immediately adjoining the Joplin city limits on the southeast. This land comprises tracts formerly known as the Oswego land, the Guinn & Lloyd land, and the Kirby land and is laid out into lots 200 ft. square and sub-leased to miners on the royalty system, at a royalty of 20 per cent. on zinc and 25 per cent. on lead; an unusually low royalty, particularly on lead, on which the royalty is usually based on the selling price of pig lead in St. Louis, making the charge uncertain and always greater than 25 per cent. The land was thoroughly drilled by the company before it was platted and sub-leased, and the lessee has an absolute assurance on the ground of this company that the lot he leases contains ore. No restrictions are placed on the operations of the sub-lessee more than the ordinary restrictions of the usual lease granted in the district, which in a general way only requires the lessee to work the ground continuously in a workmanlike manner and to pay the royalties.

Sub-lessees clean their ore on hand jigs, on steam mills of their own, or have it cleaned at the custom mill of the company. But while the company imposes no more irksome conditions than other companies operating in the district, it gives its sub-lessees advantages offered by no other company. It maintains a lumber yard, a blacksmith shop, a store carrying a complete line of miners' supplies and everything needed by the miner, and sells goods as cheap as they can be purchased at any store in the city, either to its direct employees, or to sub-lessees; and it operates the largest and best mill in the district, cleaning ore for its tenants or others at a fixed charge per ton, the ore for each customer being kept in separate bins and sold separately.

About one-half the land owned by the company is inside the city limits, and is laid out into streets and alleys. The shipping facilities are unusually good on this land, as it is crossed by three lines of railroads, the Frisco, the Missouri Pacific and the Kansas City, Fort Scott & Memphis. There are 350 miners' houses on the ground of the company, and most of them are neat little cottages, superior to anything usually found on corporation ground, and comparing favorably with much of the residence portion of the city proper. The city water system extends to the grounds of the company, and it maintains a fire department for its own protection. From 80 to 100 men are employed by the company at the mill and in work of various kinds on the ground. Mr. James Campbell of St. Louis, who is one of the heaviest stockholders of the company, has an elegant modern cottage on the grounds of the company. The grounds are handsomely laid out with blue grass lawns and shade trees, and the house contains all city conveniences, including steam heat, electric lights, hot and cold water, etc. Superintendent Conklin and other officers of the company also have residences, and as these extensive improvements have all been added after two or three years' ownership of the property, it is evident that the stockholders are satisfied with results.

The mill of the company is a 400-ton quadruple mill. In reality it consists of four 100-ton mills under one roof, each division of the mill being operated by an electric motor of 40 H. P. The mill was built in the summer of 1899 and cost \$40,000, and in addition to the mill there is an electric power station which cost \$15,000. The power station is equipped with a battery of four 100-H.-P. boilers and a 300-H.-P. engine, and furnishes sufficient power to run the big mill of the company, a 100-ton mill for one of the lessees, power to run a number of mine ventilating fans, to light the power house, mill and offices of the company, and the residences of the stockholders and officers of the company on the grounds, and two centrifugal pumps to supply water. The two tailing elevators are also driven by electric power.

The company operates a large number of pumps, draining the ground to a very large extent, and it also has about 2½ miles of tramways over which are run mule cars holding about a ton, to convey the ore from the various shafts on the ground to the mill. The cars are run into the mill and hoisted to the upper platform, where they are dumped automatically. The company is the only one in the district using tram cars on its grounds, and the system has been found to be a saving over old methods of handling ore.

The charge made by the company for concentrating ore is a very moderate one to the sub-lessees, but to parties off its land the charge is 20c. per ton above the price paid by the tenants. The full capacity of the mill is 400 tons each shift of 10 hours, and there are many features in use in no other mill. The dirt is fed automatically to a revolving screen, and one man manipulates a lever which regulates the feed for two mills. Nothing goes direct to the rougher, but everything goes to a screen with a ½ mesh, as most of the dirt is free ore. Everything is sized to ½ in. and under, and if the stuff does not go through the screen it is returned. Everything passing through the screen goes to the roughing jig. Dirt that will not pass through the screen goes to the crusher, and from there to the rolls and back to the original screen. Chats from the rougher pass through a set of chat rolls and back to the screen, and tailings pass directly to the tailing spout. Smit-tem from the rougher goes to the cleaner, and the product from the cleaner is passed by return elevators back to the original screen. This

process, it has been found, results in saving the greatest possible percentage of the ore.

The interior view of the mill will give an idea of its magnitude as compared with most of the mills in the district, and the two views of the land of the company give an idea of the large extent of the operations.

Mr. H. R. Conklin, the superintendent of the company, to whom much of the success of its operations is due, is a graduate of Cornell University and also of the mining department of Washington University at St. Louis.

PEAT IN RUSSIA.—The great scarcity and high price of coal has induced the Russian Minister of Communications to enjoin trials of peat for firing engines to be made on the Nicolas Railway. When the price of wood rose 20 per cent., that fuel had been used exclusively on the line named; but naphtha refuse was substituted. When, however, the price of this latter rose to a high point, attention was turned to peat, which is very abundant in the north of Russia. Formerly this fuel did not give satisfactory results, because the briquettes contained a large proportion of humidity; but subsequent improvements hold out the hope that peat can now be employed to better advantage.

MINERALS IN BOSNIA.—The working of minerals in Bosnia and the Herzegovina is dealt with in the "Revue Generale des Sciences" for April by M. A. Lebrun, Ingenieur des Mines, who observes that Bosnia is interesting, if not through the importance at any rate through the varieties of its deposits, fuel under the form of lignite being found there, as well as salt, and the ores of iron, manganese, chromium, lead, zinc, copper and mercury, besides gold and silver, the mines being worked almost entirely by the State. In addition to salt, which, as in Austria, constitutes a monopoly, the State possesses large collieries at Zenica, lignite mines at Tuzla, and two-thirds of the iron ore mines at Vares, all which mines it works directly.

COKE SYNDICATES IN FRANCE.—Two coke consumption syndicates have lately been founded, one in France and the other in Belgium, the first of which, under the name of Societe Lorraine de Carbonisation, embraces the iron works of Micheville, Longwy, F. de Saintignon, Raty et Compagnie, La Providence, Senelle, Maubeuge, La Chiers and Gorcy. The site chosen for the works is 7 kms. from Douai, in the Nord, between Auby and Leforest, where there is a canal wharf for receiving the coal, while the coke will be sent off by a branch line with junction at Leforest Station. The plant is to comprise, in the first place, 150 Collin recovery ovens, of which 90 are to be started at the beginning of next year and the remainder in the following May.

THOMAS SLAG IN EUROPE.—According to L. Grandeau, in the Paris "Temps," the quantity of Thomas (basic) slag sold for use as a fertilizer in Europe in 1899 was as follows, in metric tons:

	Sold.	Used in	Ex-
	in	country.	ported.
Germany	786,000	730,000	56,000
Great Britain	256,000	110,000	146,000
France	198,000	198,000	.....
Belgium	112,000	80,000	32,000
Austria-Hungary	64,000	90,000	.....
Totals	1,416,000	1,208,000	208,000

In Austria-Hungary the consumption exceeded the production by 26,000 tons, and that quantity was imported, chiefly from Germany. The exports of the remaining 208,000 tons were divided as follows: Italy, 45,000 tons; Russia, 40,000; Holland, 40,000; Switzerland, 22,000; Sweden and Norway, 20,000; countries outside of Europe, 41,000 tons.

MINING IN MADAGASCAR.—Complying with a request of the "Office Colonial," the French General Pennequin has communicated a report by Captain Mouneyres, chief of the Madagascar mine service, as to the nature and situation of metalliferous deposits in that island. It appears from this document that magnetic oxide of iron exists near Ambodivariona, about 35 kms. to the southwest of Fianarantsoa, and also near Mahatsinjo, about 10 kms. to the north of Tsaratanana, and near the River Mahajamba. Brown hematite occurs near Ambatotapaka, about 2 kms. east-northeast of Antsirabe, and magnetite near Andranofito, about 35 kms. west-southwest of Tsinjorivo, on the Orndie. Numerous iron mines are also known to exist in Mantasoa and Tsiazompanizy, where they have been worked for a long time by the natives. The only concessions at present granted, irrespective of gold, are three for iron mines, situated at Maroangotra and Ranomangazioka, on the boundary of the eastern forests, and at Ambohyana, about 25 kms. east-south-east of Tananarive.

NEW COKE PLANTS IN BELGIUM.—A plant of 150 ovens for turning out 150,000 tons of coke yearly has been begun at Willebroeck, about midway between Antwerp and Brussels, by a "societe anonyme," or limited liability company, with a capital of 1,500,000 fr. The capital is entirely subscribed by 12 iron smelting companies—Cockerill, Angleur and Esperance in the Liege District; Athus, Musson and Halanzy in Belgian Luxembourg; La Providence, Couillet and the Sud de Chatelineau near Charleroi; La Louviere, in the Center; Monceau and Thy-le-Chateau; and the president of the conseil d'administration is M. Chantraine, manager of the Angleur Steel Works. As to these ovens, the "Moniteur des Interets Materiels" observes that one of the most important points to settle was that of the site of the works, which will adjoin the Willebroeck station, while having a wharf on the canal. The coal supplies can therefore be obtained either by rail or by water; and the coke turned out can be sent off by either mode of conveyance. The site was, in fact, chosen so that the ovens should never be dependent on the coal of any one country, but that the collieries of Belgium, France, Germany, England and even America may send their products to the works. Each of the subscribing companies can make arrangements for receiving from 500 to 2,500 tons of coke per month, according to requirements.

THE DOMINION IRON AND STEEL WORKS, CAPE BRETON.

An interesting description of the Dominion Iron and Steel Company's works, published in the Cleveland "Iron Trade Review," says that the ores used comes from the Wabana Mine on Great Bell Island, in Conception Bay, Newfoundland, about 35 miles from St. John's. The red hematite of which the ore bed is composed is found in the form of small blocks of reasonably regular size. These vary in length from a few inches to several feet. The entire ore bed embraces something over 800 acrs, and the bed has at its shallowest section a thickness of

considerably increased by improvements now in contemplation. The chutes of the ore dock are moved by a counter-balanced winch which may be readily operated by one man. The dumping of the cars is accomplished by an automatic tippie, which is upset by the weight of the loaded car and returned to an upright position by means of cast iron counterbalance weights hung upon a shaft beneath the floor.

Connecting the mine and the dock is a double track cable tramway. This is 2 miles in length and of 2-ft. gauge, and is operated by a 15-16-in. endless steel cable 4 miles in length. The equipment includes upward of 400 cars. The average cost of mining the ore, transporting it

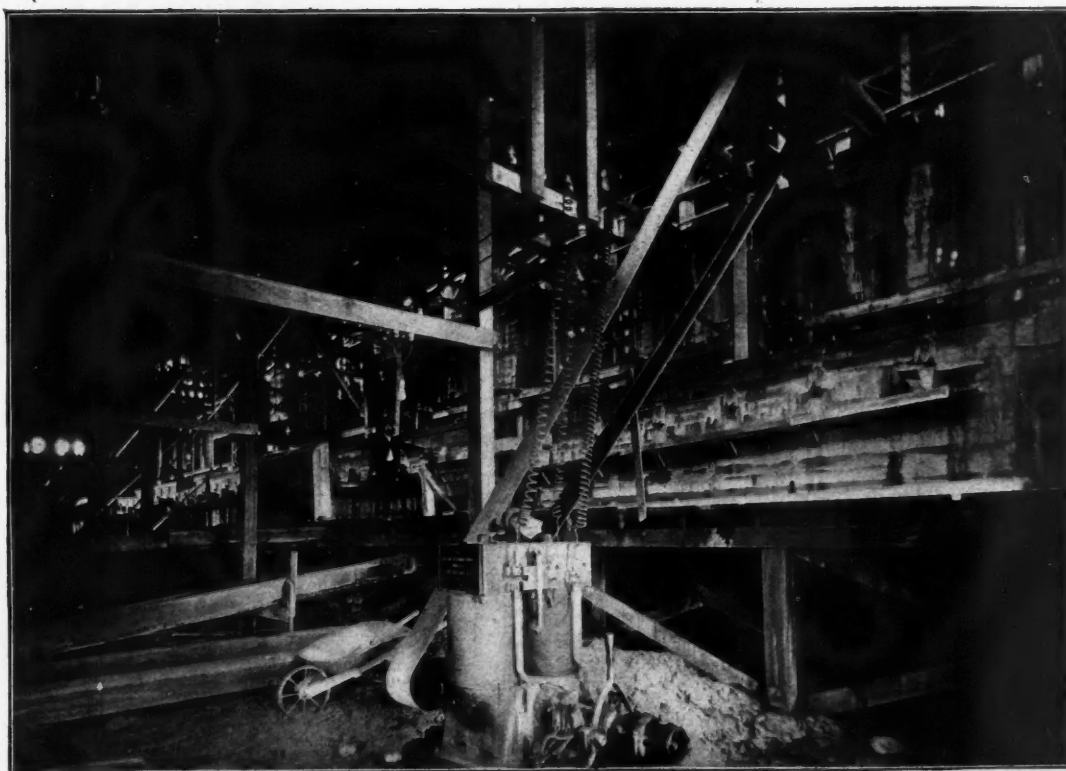


MISSOURI LEAD AND ZINC COMPANY'S MILL—EXTERIOR.

fully 8 ft. It has been estimated that this deposit is capable of yielding at least 25,000,000 tons of ore of available quality.

Great Bell Island is about 8 miles in length by 2 in width; and while the northern side, where the iron mines are situated, is exposed to some pretty severe winds, there is on the other side an excellent and perfectly sheltered harbor. Here a shipping pier has been constructed,

to the dock and placing it aboard vessels ranges from 25 to 30c. per ton. Ore was first shipped from the Wabana Mine late in 1895, and since that time about 600,000 tons have been shipped, more than half of it during 1899. The Newfoundland mineral act exacts no governmental royalty on the ore mines, the only provision being that the operators shall make an expenditure of at least \$6,000 per square mile



MISSOURI LEAD AND ZINC COMPANY'S MILL—INTERIOR.

and the facilities provided are likely to prove fully adequate for some time to come. The pier is 65 ft. in length, 45 ft. in width and 90 ft. in height of Southern pine construction and rests upon piling surrounded by a crib-work of heavy timber filled with stone. The dock contains 10 pockets, each of 200 tons capacity, and from these the ore is discharged into vessels through chutes placed at an angle of about 40°. On occasions 200 tons have been discharged from a single pocket in 10 minutes. The present loading capacity of the dock is 2,500 tons, and this is to be

on improvements. In the case of the Wabana this has, of course, been largely exceeded. The Dominion Iron and Steel Company also owns a mine in the Santiago District of Cuba, from which ore can be brought to Louisburg at all seasons of the year, and is understood to hold options on other Newfoundland properties.

The works of the company are located at Sydney, Cape Breton, near the mines of the Dominion Coal Company, from which the supplies of fuel will be drawn. The Dominion Iron and Steel Company has placed

a contract for the construction of 400 Otto-Hoffman by-product coke ovens, which will be located between the iron works and the coal mines, and which will cost, when completed, over \$1,000,000. The gas secured in this plant will be utilized in the steel mill and the other by-products.

The iron ore of Great Bell Island contains from 54 to 59 per cent. of metallic iron, the average being 55 per cent. At the Ferrona Furnace in Nova Scotia the average charge per ton of pig iron made is 1.8 tons Great Bell ore, 0.75 ton Cape Breton limestone and 1.25 tons Cape Breton coke.

The plant at Sydney will consist of four blast furnaces, each having a capacity of 250 tons of pig iron per day under ordinary conditions. Each will be 85 ft. in height and 19 ft. in diameter. In the steel mill the basic open-hearth system will be used exclusively, but the exact type of furnace has not been decided upon. There will be from 10 to 12 furnaces in the steel plant. The estimates as to the cost of making pig iron at Cape Breton give a total of about \$5.50 per ton under present conditions. The present Dominion law provides for a bounty of \$3 a ton on pig iron made from Canadian ore, or \$2 if made from other ores, and for \$3 a ton on steel ingots made from Canadian iron. This is in force until 1907.

The new plant will be under charge of Mr. Arthur J. Moxham, who has had much experience in Ohio and in Alabama.

SUGGESTIONS FOR IMPROVED COAL MINING ACCIDENT STATISTICS.—I.

Written for the Engineering and Mining Journal by F. L. Hoffman.

"No question connected with the mining industry," writes the Illinois Labor Commissioner in the latest coal report, "excites so much interest and sympathy as that relating to the number of men whose lives are sacrificed in the prosecution of their business," and while this theory may hold true in a measure of accidents of alarming proportions such as the recent disaster in Utah, it hardly applies to the general occurrence of mining accidents which pass without serious consideration on the part of the general public. Few questions within the domain of practical statistics have received such crude treatment and been considered in so crude and indifferent a manner as the occurrence of fatal and minor accidents in coal mining operations. This criticism is made in full recognition of the fact that much has been done to diminish the accident liability in coal mining in this country; but the fact remains that after all the years of experience and observation the occurrence of such accidents is still very great and, I am satisfied, much greater than there is need of in the light of present knowledge and mechanical skill, tending constantly, in other industrial occupations, to diminish the liability to fatal and less serious accidents. This view is not shared by the Labor Commissioner of Illinois, who, in the report previously mentioned, expresses the opinion that "while association with the ordinary risk which all miners assume may, in time, develop a degree of indifference, the sources of danger are so numerous and uncertain that most of the fatal accidents may be safely ascribed to causes unseen and therefore not preventable." It is the opinion of the writer that this view is entirely unwarranted by the facts and one which cannot be too severely condemned as a fatalism and submission to the forces of nature, which it is for the intelligence of man to bring under his proper control.

A careful study of the facts pertaining to the large number of accidents in coal mining operations, especially those caused by falls of roofs and sides, will convince even the one most inclined to let nature take its course, that with proper precaution and with a proper regard for the danger and an intelligent appreciation of the real problems involved in mining operations, a large number of fatal and other accidents are easily preventable.

A careful review of the facts entering into the question of an improved system of mining accident statistics would necessitate the writing of a special treatise and it is only possible in this article to treat of the essential aspects of the problem, leaving minor matters for the time being out of consideration.

The first necessity for an improvement in the present day method is a radical change in the manner in which the statistics of accidents in mining operations are presented in the annual reports of mine inspectors, and most of all a decided change in the arrangement of the tables and the calculation of rates and ratios as they are now in common use and the majority of which are as useless as they are misleading and often a positive hindrance to an improvement which will make such statistics intelligent and representative of the actual conditions as they pertain to coal mining operations.

We may concede a certain value to the bare statement of the actual facts pertaining to the accident occurrence in the mining industry in any given section of the country. It is of some value, for general purposes, to know the actual number of lives lost and the number of persons injured, but the application of such data to general principles of public policy incorporated in legislative enactments is a matter fraught with much danger in view of the probability that public opinion based on such general information will either over-estimate or under-rate the actual danger pertaining to the mining industry. No intelligent idea of the actual risk in coal mining is conveyed to the mind by the bare statement, for instance, that during the year 1899 there were 84 lives lost in coal mining operations in the State of Illinois. Some standard of comparison is required by which the mind is able to grasp the relative importance of this fact. If the subject is presented in the usual manner of press abstracts of official reports the same will, perhaps, contain the additional information that the number of lives lost have been in the ratio of so many tons of coal mined to every life lost, and for Illinois, for the year 1899, the ratio calculated in this manner would be one life lost to every 278,982 tons of coal mined; but even the trained observer is as unenlightened as ever because there is no basis of comparison, no standard by which the risks of mine operations can be measured and compared on the basis of coal production. The reader will inquire as to the real meaning of this ratio and no

answer can be made except that it has always been the custom to state the ratio of loss in mining operations in this manner and that for the sake of conformity the annual loss of life is continued to be represented in this form. Nothing is more misleading and absolutely useless than this crude method of calculating the actual loss of life on the basis of the annual amount of coal production. It would be as absurd to base the loss of life in the oil fields on the number of gallons of oil produced during the year, or the loss of life in the Gloucester fisheries on the number of fish caught during the season, or the loss of life in the railway mail service on the number of letters carried, as to base the loss of life in coal mining operations on the number of tons of coal which have actually been produced. It manifestly requires only a moment's thought to convince the reader that for general purposes a ratio of this kind is useless and misleading, antiquated and absurd.

A less crude but still unsatisfactory method is to calculate the loss of life on the average number of persons employed, stated in the manner of the number of persons employed to every life lost. This method was commonly employed in health offices some 50 years ago, but it is now no longer made use of in the annual reports on the vital statistics of the various cities of this or other countries. Mining statistics in this respect are 50 years behind the times and there is no warrant for this practice except that it is one which has also been in use for many years and which is continued for the sake of conformity.

In the last Illinois coal report the loss of life in coal mining operations in that State is given in this manner and represented as having been one life lost to every 400 persons employed; but a moment's thought will make it clear that no intelligent meaning is conveyed to the reader by this bare statement of the actual facts. We may properly ask what is a high or low ratio on this basis? No intelligent answer can be made to this question, for the loss of life in other dangerous occupations is not in a single instance stated in this antiquated manner. However, this ratio has the intrinsic merit that it can be converted into a rate of lives lost to each 1,000 persons employed. By converting the ratio of one to every 400 into a rate of 2.3 per 1,000 at once makes the problem a very simple one and intelligent to every reader at all familiar with mortality statistics. It is only on the basis of such a rate, calculated on a uniform basis from the average force of persons actually exposed to risk of fatal injury, that an intelligent idea is conveyed to the reader, ever so slightly familiar with mortality or accident statistics. The rate in this instance is shown to have been 2.3 per 1,000, while in a general way the mortality of American cities is about 17 or 18 per 1,000; hence the fact is made clear that the general mortality from fatal accidents in mining operations in Illinois forms a not inconsiderable proportion of the aggregate mortality from all causes, and if the comparison is carried further and made more scientific by comparing the accident liability of coal miners with the death rate of men of ages 15 to 65, it can easily be shown that the accident risk in coal mining is a very material element in diminishing the duration of life among men engaged in this occupation. The rate thus calculated on the basis of every 1,000 men employed is properly comparable with similar rates calculated for men engaged in other hazardous occupations, and as an illustration of the utility of this method I give below a table showing the accident rates for men employed in various occupations in this country:

Fatal Accident Liability in Various Occupations. Rates per 1,000 Persons Employed.

Occupation	Year	Rate per 1,000	Rate per 1,000
Gloucester fishermen	1888-97	13.3	
Trainmen on American railways	1889-98	7.7	
Switch and flagmen	1889-98	5.9	
Other railway employees	1889-98	1.1	
Railway mail service	1890-99	1.1	
Life-saving service	1887-96	1.6	
Paid firemen, American cities	1889-98	2.5	
Policemen, American cities	1889-98	0.7	
Street railway men (Massachusetts)	1895-98	0.2	
Coal miners (United States)	1887-96	2.6	
Coal miners (Pennsylvania anthracite)	1887-96	3.2	
Coal miners (Pennsylvania bituminous)	1887-96	1.1	

The utility of this method of representing the actual risk incident to general coal mining operations is clearly brought out in this table of comparative accident rates for men employed in various dangerous occupations, and I believe that it is made clear that the method now in vogue of either stating the loss of life in the manner of a ratio based on the annual coal production or in the manner of one life lost to a certain number of persons employed, is not only inadequate and useless for general purposes but that the advance made in general mortality statistics demands a corresponding improvement in the accident statistics of coal mining operations.

Before I consider other essential aspects of the question I wish to here call attention to a matter which has received careful consideration in some of the annual reports of State Mining Inspectors,

Accidents in Coal Mining in the State of Illinois. General Table.

Years ending Dec. 31.	Average number of employees.	Fatal accidents.	Rate per 1000.	Non-fatal injuries.	Rate per 1000.
1889	30,076	42	1.4	201	6.7
1890	28,574	53	1.9	294	10.3
1891	32,951	60	1.8	367	11.1
1892	33,632	57	1.7	370	11.0
1893	35,390	69	1.9	403	11.4
1894	32,635	72	2.2	521	16.0
1895	31,962	75	2.3	605	18.9
1896	33,054	77	2.3	672	20.3
1897	33,788	69	2.0	518	15.3
1898	35,026	75	2.1	438	12.5
1889-98	327,088	649	2.0	4,389	13.4
1899	36,991	84	2.3	597	16.1

while in others a very indifferent treatment is accorded to the subject. While, as I have stated, there is something of value and interest in the plain statement of the fact that a certain number of lives were lost during a given year at the corresponding accident rate per 1,000 engaged, this statement is insufficient unless a basis of com-

parison is afforded by the returns for previous years. As far as possible every report of a State Inspector of coal mines should contain a table constructed in the manner outlined below, showing the general facts pertaining to the coal mining industry for the preceding 5 or 10 years and the current year, for which the report is made:

In the above table I have made use of the returns of the State of Illinois for the past 11 years as they have been reported in the last annual coal report for that State. I believe that it is more satisfactory to exclude the last year from the calculation of the average rate for a given period calculated for comparative purposes, since by this method the year under consideration is brought out more prominently as regards a favorable or unfavorable experience. I have included in this table a column for non-fatal accidents which represents a subject properly deserving of special consideration. I have always been strongly inclined to make very little use of the returns of non-fatal accidents in mining

in the reports for some of the States sufficient information as regards the occupation of the men killed and injured is given to make possible a crude calculation of the rates required, but to make the returns exact the same should be tabulated in the same manner as similar data are tabulated for the men employed inside or outside of the mines. A difficulty will of course present itself in the occasional occurrence of accidents below ground to men properly employed on the surface, while men employed in the mines will occasionally meet with accidental injury or death outside of the mines. To meet this point it might be desirable to add a second column for this purpose, but since such accidents are of rare occurrence it hardly seems necessary to burden the reports with additional information on this point. Brief references might be made in the explanatory text, stating that out of a given number of deaths due to accidents, a stated number had been in consequence of general conditions outside of the occupation. Such in-



MISSOURI LEAD AND ZINC COMPANY'S LAND, LOOKING NORTH.

and other industrial occupations, since it is practically impossible to insure uniformity of returns.

It is much to the credit of the State of Illinois that there the non-fatal accidents are reported in such detail that it is possible to form a very satisfactory idea of the true nature of non-fatal injuries. Since this subject, however, does not properly fall within the scope of this article I cannot here discuss the matter at length and I limit myself to the statement that it would indeed be a very satisfactory and useful contribution to mining accident statistics if the method in use in Illinois were adopted by other States and that the nature of non-fatal injuries were fully set forth in a special table designed for this purpose.

Having pointed out the first essential in an improved statement of mining accident statistics, namely, the necessity of calculating rates on the basis of the average number of men employed during a given

formation is now furnished for men employed on the police force, fire departments, etc., where one column will show the deaths due to accidents incident to the occupation, while another column will show the deaths due to accidents in general. However, as stated, such accidents are comparatively infrequent and the subject need hardly receive serious consideration until a sufficient advance has been made in more elementary matters.

A careful study of the last outlined table will point to a material improvement in the statement of the actual risk incident to mining operations, and in the absence of more detailed information such a table would serve a very useful purpose. But a still greater improvement would be introduced into mining accident statistics if for each class of men employed in well-defined groups of occupations, above or below ground, the details as regards numbers exposed were also given and



MISSOURI LEAD AND ZINC COMPANY'S LAND, LOOKING NORTHEAST.

period and on the basis of 1,000 persons exposed to risk, I now call attention to the second essential, namely, the necessity of dividing accidents according to the place of occurrence, whether above ground in general operations or below ground in actual mining operations. Manifestly, a rate calculated on the total number of men employed in coal mining must be misleading in that a very considerable proportion of the total number of employees are not exposed, in any serious manner, to the risk incident to actual inside mining operations; hence the necessity of dividing accidents in the manner that each group is separately stated and each rate is separately calculated for the operations above ground and the actual mining operations below ground. I have framed the following table in accordance with this suggestion, and have designated the same special table No. 1:

Accidents in Coal Mining in the State of Illinois.
Special Table No. 1.

Employments.	Average No. of employees.	Fatal acci-dents.	Rate per 1000.	Non-fatal accidents.	Rate per 1000.
Inside
Outside
Total

That it would not be at all difficult to compile such a table and to calculate the rates required, is brought out by the fact that in most of the mining reports of the States of this country information is now published as regards the number of men employed inside and outside of the mines, but similar information as regards the occurrence of accidents inside and outside the mines is not properly presented at present in any of the mine reports published in this country. It is true that

incorporated in a more elaborate table, of which I give an outline below and which I have designated as Special Table No. 2:

Accidents in Coal Mining in Pennsylvania.
Special Table No. 2.
Accidents According to Occupation.

Occupation.	Average No. of employees	Fatal accidents.	Rate per 1000.	Non-fatal accidents.	Rate per 1000.
Outside:					
Office force
Foremen
Engineers
Firemen
Blacksmiths, Carpenters.....
Slate pickers
All other Company men
Total outside.....
Inside:					
Foremen and Mine Bosses..
Fire Bosses.....
Miners.....
Mine Laborers.....
Drivers and Runners.....
Door-boys and Helpers.....
All other Company men
Total inside

I have only included general well-defined occupations, but the table could be improved upon by adding additional occupations sufficiently well defined to avoid a confusion in the returns. That it would not be at all difficult to compile such a table is made clear by the fact that in many of the mining States, including Pennsylvania, statistical information is now published as regards the number of men employed according to specified groups of occupations and it would only be necessary to improve slightly the present method by stating the occupation of the killed or injured to make the same applicable for the purposes of being utilized for the proposed occupation table of accident rates. As a matter of fact it is even now possible, from the information published in the Pennsylvania reports, to calculate the accident rate for miners, mine laborers and a few other well-defined inside occupations, but the returns as regards all the principal occupations are not made sufficiently distinct to indicate, first, whether the person injured or killed was employed above or below ground; second, whether ill-defined occupations such as "head men," "bottom men," "timber men," "laboring men," etc., are properly belonging to "other company men" employed above or below surface. As an illustration of the utility of a table setting forth the actual risk incident to each specific and well-defined group of men employed in coal operations, I may state briefly the facts as they have been calculated from the returns for the Third Anthracite District of Pennsylvania for the year 1897. In that district the mortality from fatal accidents was 6.5 per 1,000 for miners, 4.5 per 1,000 for mine laborers, 3.5 per 1,000 for runners and drivers, 2.2 per 1,000 for door tenders and 2.3 per 1,000 for all other inside men, while for outside workers the rate was only 0.7 per 1,000. Thus it is shown that very material differences exist in the accident liability of the different occupations making up the general coal mining industry, and it will readily be recognized that a most important improvement in mining accident statistics will be brought about by thus clearly setting forth the accident experience of each district or State.

If it were, therefore, possible to adopt and incorporate in future reports of mine inspectors these very simple suggestions, all of which can be introduced without serious changes in the present make-up of the reports, and none of which require exceptional skill or ability, there would soon be brought together a sufficient basis of facts to make it possible to form an accurate conception of the real risk at present inherent in mining operations, and as the reports were made from year to year it would become possible to trace with a most unerring accuracy the increase or decrease of each class of risks, as they pertain to any particular group of occupations.

(To Be Concluded.)

ABSTRACTS OF OFFICIAL REPORTS.

Alaska United Gold Mining Company, Alaska.

This company operates the Ready Bullion and 700-ft. mines on Douglas Island, Alaska. The report is for the year ending December 31st, 1899. The total earnings for the year were \$586,787. The operating expenses were \$462,041, and interest, \$11,329, making a total of \$473,370, and leaving a surplus of \$113,417. The tons mined and the returns for the year were as follows:

	Ready Bullion.	700-ft.	Totals.
Tons ore mined and milled.....	162,107	85,065	247,172
Tons sulphurets saved.....	3,116	1,651	4,767
Tons sulphurets treated.....	3,232	1,234	4,466
Yield in free gold from mill.....	\$317,546	\$99,345	\$416,891
Yield from sulphurets.....	123,147	46,749	169,896
Total yield.....	\$440,693	\$146,094	\$586,787
Average per ton, free gold.....	\$1.96	\$1.17	\$1.68
Average per ton, sulphurets.....	0.76	0.55	0.65
Total per ton crushed.....	\$2.72	\$1.72	\$2.33
Average per ton sulphurets treated.....	38.10	37.87	38.04

On the Ready Bullion, the development work included 47 ft. shaft sinking, 1,545 ft. drifting, 475 ft. cross-cutting, 1,270 ft. raises, 982 ft. intermediate drifts; a total of 4,319 ft. The ore in sight at the close of the year was 263,280 tons. On the 700-ft. claim the development was 695 ft. drifts, 62 ft. cross-cuts, 427 ft. intermediate drifts, 437 ft. raises; a total of 1,621 ft. The ore in sight is 293,870 tons. The accompanying map shows the condition of the mines at the close of the year.

The expenses in detail were as follows:

	Ready Bullion.	700-ft.	Total.
Total receipts.....	\$440,693	\$2,7185	\$146,094
Mining costs.....	\$215,479	\$1,3292	\$93,365
Milling and concentrating.....	66,510	0,4103	31,681
Sulphuret expenses.....	27,035	0,1668	10,662
General expenses.....	5,282	0,0326	4,402
San Francisco office.....	1,140	0,0070	950
London office.....	339	0,0021	283
Consulting engineer.....	493	0,0030	410
Bullion charges.....	3,075	0,0190	935
Total expenses.....	\$319,353	\$1,9700	\$142,688
Mining profit.....	\$121,340	\$0,7485	\$3,406

On the 700-ft. claim milling was in progress during only 8 months of the year.

Superintendent A. M. Robeson's report says: "On the Ready Bullion Claim a small amount of ore still remains in sight above the adit level, but as it is in small bunches here and there it has not been included in the ore in sight. The vein formation extends beyond the east of the surface workings, but as little exploration work has been done in that direction, no opinion can be formed of its value. During the latter half of the year the 70 ft. level has been opened westward from No. 1 Shaft, with the object of ascertaining the practicability of extracting the good ore at the eastern end of the mine, lying above 300 ft. level. One stope in very good ore has been about half worked out without any signs of sea water. The level is now being extended further to the west, where another block of good ore can be extracted. On the 300 ft. level the only work done during the year was a small amount of drifting for air-ways. On the 450 ft. level the greater part of the development work for the year has been done. The west

drift has been extended about 200 ft., and a stope, No. 2 west, has been started. In the stope the vein will average 30 ft. thick and will pay, but to the west the lode is very poor and narrow. On the east the level has been extended about 135 ft.; one stope, No. 2 east, has been opened, and has now nearly reached the 300 ft. level. The vein in the end of the drift is too narrow to stope, but still carries good values. To the west the lode is very poor and narrow. On the east, with the object of securing a large body of payable ore left standing there, the 600 ft. level has been opened over 200 ft. to the east and 150 ft. to the west of the station, and two cross-cuts have been made towards the hanging wall. The vein is very thick, but carries very small values except on the footwall. The pay ore is known to greatly increase in thickness towards the 450 ft. level. On the main shaft sinking has been resumed and will be continued until the 750 ft. level is reached.

"The 120-stamp mill has run an equivalent of 354 days for the full mill of 120 stamps out of a possible 363 days, crushing 162,107 tons of ore, or 3.81 tons per stamp per day. A large amount of development work has been done during the year, although not much payable ground has been added to the reserves. This is partially due to the small amount of ore that had actually reached the stoping stage at the beginning of the year, and the consequent urgent necessity of preparing more stopes to meet the demands of 120 stamps when the surface ore, which has supplied over one-third of the year's crushing, should be exhausted. A Riedler pump has been placed on the 600 ft. level; it is giving entire satisfaction. The average number of men employed, including Indians, was 167, and the average amount paid each, including board, was \$3.07 per day.

"On the 700 ft. claim in the adit level the raise for No. 2 pit was put through to the surface, and a good portion of the year's crushing has been taken out of it. No other development work has been done on this level. To the west, this level has reached the boundary of the Alaska Treadwell Company's property, and a large stope has been started which contains payable clean ore from wall to wall. On the east the level is now about 325 ft. from the end line. Like the upper ore, the 260 ft. level has been driven to the western boundary, and the first stop has been started there. The lode contains nothing but clean ore, and has gained some strength as compared to the levels above. The payable ore also extends for a great distance from the Treadwell boundary. On the east 350 ft. remain to be driven before the boundary is reached.

"On April 18th the 100-stamp mill was started and ran as full an extent as possible for the rest of the year. As, however, the water power could not be spared by the Alaska Treadwell Company at all times a large amount of time was lost, principally in the last months of the year. A steam plant, which should be at work by next March, is now being installed with the view of providing for all future shortages of water-power. The total time run is equal to 203½ days for the full mill of 100 stamps, crushing 85,065 tons of ore, or 4.18 tons per stamp per day. This is an excellent result, but one which can be improved on when the annoying delays, due to lack of power, are done away with. Although the present appearance of the mine is good, and ore equal to a two years' supply is available without extending the present levels, it is advisable to sink the shaft at least 110 ft. and to open the 370 ft. level, during the ensuing year. The average number of men, including Indians, employed per day for the year was 69, and the average amount paid each including the cost of board, was \$3.21 per day."

Waihi Gold Mining Company, New Zealand.

This mine in the Thames District of New Zealand has been the most successful of all mines in that colony and the report of 1899, which has just been published, shows that the condition and prospects of the mine are better than ever. This property was originally acquired in 1887 by the same financial group in London who introduced the Richmond Mine of Nevada to the London public. At first, some time was spent in experimenting on a suitable process for the treatment of the Waihi ores, as it was found that the ordinary stamping and amalgamating gave a very poor extraction on account of the extraordinary fineness of the gold particles, and it was not until dry stamping and cyaniding was adopted that the prosperity of the company commenced. Dividends at the rate of 20 per cent per annum were paid in 1893 and 1894, and at the rate of 40 per cent. in 1895, 1896, 1897, 1898 and 1899, while since the end of 1899, the period covered by the present report, interim dividends at the rate of 50 per cent. are being paid. The capital was originally £100,000, but on several occasions it has been increased by the issue of new shares to provide for additional plant property, and the capital now stands at £320,000.

During the year under review, 102,381 tons of ore were treated, and yielded 66,053 oz. of fine gold and 189,149 standard ounces of silver. The total receipts realized by the sale of these products were £302,525. Receipts from other sources were £3,070, and the balance brought from last year was £36,580, while the total expenditure was £138,910. The total funds available for distribution were therefore £203,266. Out of this £10,000 was written off for depreciation, and £20,000 added to reserve. Dividends absorbed £128,000 and income tax £4,702, and £40,564 is the balance carried forward to 1900.

There are at present 190 stamps in operation and on account of the important developments at the mine, another 100 stamps are in course of erection. The actual saving was 88.4 per cent. of the gold contents and 57.6 per cent. of the silver contents, a slight improvement on previous years. The cost of cyaniding is slightly under 51.5c. per ton of ore. The managers intend to adopt a system of wet crushing in their new plant. A very full account of this mine and the treatment of the ores was given in the "Engineering and Mining Journal" November 12th, 1898.

During the past year the discoveries in the mine have been extremely important. On the veins which have been worked for some time no less than 261,503 tons of ore have been laid open by development, so that the total in sight at the end of the year was 687,000 tons.

Besides this, development of two newly discovered veins has shown the existence of practically another mine. These veins continue to show great strength and width and large bodies of ore have already been blocked out ready for stopping. The public and the shareholders think so highly of the future of this property that they value the £1 shares at £10, which makes the present return on money invested only 5 per cent.

ORIGIN OF NITRATES IN CAVERN EARTHS.*

By William H. Hess.

Much interest has been taken by tourists in the great caverns of Virginia, Kentucky and Indiana, and occasionally theories are advanced regarding the origin of the nitrate beds in the caverns. Popular interest is awakened by the large amount of saltpeter known to have been taken from the Mammoth Cave during the war of 1812, and from caves in Alabama and Georgia during the Civil War.

The common theory that these accumulations of nitrates are due to animal remains, and particularly to the excrement of bats, is untenable. Bats are found only near the entrances of caverns, while the cavern earth of the Mammoth Cave was worked for nitrate for a distance of 5 miles from the mouth. Again, though cavern air is dry and antiseptic, cavern earth rarely contains organic matter of any form.

RECENT DECISIONS AFFECTING THE MINING INDUSTRIES.

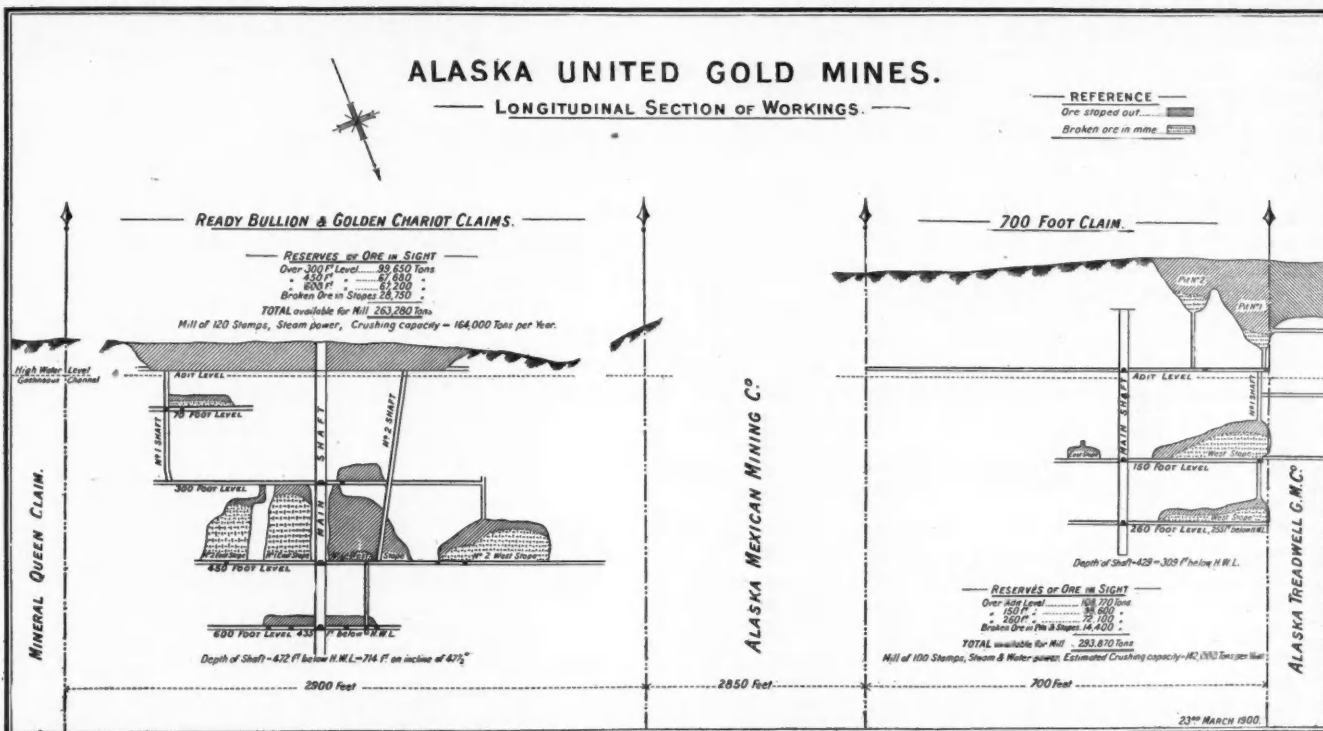
Specially Reported for the Engineering and Mining Journal.

DRAWBACK ON ARTICLES MANUFACTURED FROM LEAD.—Drawback on articles manufactured from lead produced from imported ores or imported lead bullion cannot exceed the duty paid on a quantity of such lead equal to the weight of the exported articles, 2 per cent. being allowed for wastage.—Ruling of Treasury Department on appeal of Tatham & Brothers, New York.

MINERAL COLLECTORS' AND PROSPECTORS' COLUMN.

(We shall be pleased to receive specimens of ores and minerals, and to describe and classify them, as far as possible. We shall be pleased to receive descriptions of minerals and correspondence relating to them. Photographs of unusual specimens, crystals, nuggets and the like will be reproduced whenever possible. Specimens should be of moderate size and should be sent prepaid. We cannot undertake to return them. If analyses are wanted we will turn specimens over to a competent assayer, should our correspondent instruct us to do so and send the necessary money.—Editor E. & M. J.)

141.—Silicious Calcites from the South Dakota Bad Lands.—The silicious calcites from Fontainebleau, sometimes called Fontainebleau limestone, are well-known objects to the mineralogist, and specimens are to be found in many cabinets. They consist of calcite enclosing from



Recent progress in bacteriology and agricultural chemistry has thrown much light upon the origin of nitrates in soils by the oxidation of organic matter in the presence of certain bacteria. The surface soil in cavernous regions is usually loose and porous, and consequently favorable both for nitrification of organic nitrogen and for downward percolation of the surface water. It may not be unnatural, then, to ask whether the nitrates in cavern earths may not have originated wholly or in part from nitrification of organic matter at the surface and the subsequent leaching of the nitrates so formed into the caverns. Caves would thereby act merely as receptacles for the surface drainage, and provide an avenue for the return of the percolating water to the atmosphere by evaporation.

It was found from analyses of many samples taken from saltpeter from the opening to the end, that nitrates were distributed through the entire extent of the dry chamber, irrespective of distance from the entrance.

The conclusion reached is that the nitrates in caves were brought in by water percolating through the soils above the caves and were deposited on the floors. Currents of air in and out of the caverns removed the water, and the various salts it previously held in solution were by capillary action brought to the surface of the cave earth. A cavern acts, therefore, merely as a receptacle for stopping a portion of the surface drainage. This accumulation of salts occurs only in caverns where the inflow of surface water does not exceed in amount the water removed by evaporation. In wet caves the soluble salts are washed onward with the water bearing them and so are not deposited.

Nitrates found under overhanging cliffs are of a similar origin. Water bearing dissolved nitrates percolates through the soil and finally oozes out at the surface. The water evaporates and leaves behind an incrustation of its soluble materials. The nitrates thus formed under overhanging cliffs remained permanently stored there, being securely protected from rain. They served, along with the nitrates found in the caves of Alabama and Georgia, as a source of saltpeter used by the South during the Civil War for the manufacture of gunpowder.

50 to 60 per cent. of sand. Specimens of almost the same character as those from Fontainebleau have recently been found in the Bad Lands of South Dakota, by L. W. Stilwell of Deadwood, and Geo. L. English of New York, and described in the "American Journal of Science." A quantitative examination of a typical specimen shows that the material consists of about 40 per cent. of calcite enclosing 60 per cent. of quartz sand. In the region whence the crystals come, the White River sandstone is a very abundant rock and consists of sand grains cemented together by calcareous material. Evidently the crystals in question represent a phase of sand cementation in which the crystalline form of the calcite is preserved. This kind of cementation might take place, for example, in a sand deposit wet with water carrying calcium carbonate in solution. The calcite crystallization may be conceived to go on, until crystals of a certain size have been produced, the calcite material growing about and enclosing the sand grains, and then it seems necessary to consider that the crystallization ceased, owing to changed conditions, for otherwise an ordinary solid sandstone with calcareous cement would result. The partial wearing away of such a sand deposit in which crystallization had taken place would then expose the crystals.

An interesting feature of the silicious calcites from the new locality is the peculiar shape of the crystals. They are steep hexagonal pyramids, somewhat barrel-shaped and with rounded ends. In a rhombohedral species a hexagonal pyramid must be a pyramid of the second order, and that the crystals from the Bad Lands are of this character may readily be told by examining their ends before a strong light; when, on turning the crystals, the reflection from the rhombohedral cleavage of the calcite is only caught when the alternate edges of the pyramid are toward the light. With the aid of a lens no difficulty is experienced in observing the calcite, filling the interstices between the quartz grains,

*Abstract of article in "Journal of Geology."

and in detecting its cleavage. Pyramids of the second order are seldom observed in calcite, even as small faces in complex combinations, while crystals showing the hexagonal pyramid alone, or with but slight modifications are exceedingly rare. The sand in the specimens is mostly nearly uniform in grain, the grains averaging $1/3$ to $1/2$ m.m. in diameter, and being well rounded. Imbedded with the finer sand occur large rounded grains of quartz as much as a centimeter in diameter, yet in spite of these the pyramidal forms of the crystals are well developed. The crystals are of a gray color, much like the Fontainebleau specimens.

142.—Molybdenite.—Fine specimens of molybdenite, it is said, have recently been found near Lake Chelan, Okonogan County, Washington, on claims owned by J. E. Moore.

QUESTIONS AND ANSWERS.

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert. Nor can we give advice about mining companies or mining stock. Brief replies to questions will be welcomed from correspondents. While names will not be published, all inquirers must send their names and addresses. Preference will, of course, always be given to questions submitted by subscribers.—Editor E. & M. J.)

Explosives.—Is any new explosive taking the place of dynamite for blasting in the mining regions, say in the anthracite coal region of America, or in any of the gold mines or silver mines of the West, and if so what is the name of this new explosive? Can you inform me on this subject and tell me where I can get the circulars of any new explosive?—E. B. T.

Answer.—Black powder and dynamite in its usual standard and recognized forms are the chief explosives used in mines of all kinds in the United States. In the anthracite collieries black powder is the explosive most generally in use, though dynamite is often used for running passages, openings in hard rock and similar work. New explosives are constantly being brought out, which generally vary very little from the well-established varieties, but are advertised under various names. No radically new explosive has recently been introduced, or is replacing the other ones. You can obtain circulars of explosives from any of the manufacturers whose cards are published in our advertising columns.

Coal Washing.—Will the washing of fine or slack coal before sending it to the coke ovens, do more than remove dirt or earthy impurities?—J. T. R.

Answer.—It is well established that washing coal improves its quality in several respects. Thus in some experiments made by Dr. W. B. Phillips on Alabama coal, it was found that with a Robinson washer, treating unsized coal, the proportion of ash was diminished from 11.9 to 6.7 per cent.—an average of several trials—showing a reduction of 43.5 per cent. in the ash. With the Stein jigs on slack coal the proportion of ash decreased from 17.7 to 6.7 per cent., a reduction of 61 per cent. of the ash. Again experiments made with Pittsburg slack showed a reduction in the proportion of sulphur, averaging several trials, from 2.23 to 1.19 per cent. In another set of tests the sulphur was reduced from 2.12 to 1.05 per cent. The washed coal made coke with sulphur below the usual limit for furnace coke, while the unwashed coal would not do so. The advantages of coal washing are generally admitted. See "The Mineral Industry," Volume VII., pages 761-764.

Open-hearth Steel.—I have heard of some remarkable work done in the basic open-hearth furnaces at the Homestead Steel Works of the Carnegie Company. Can you tell me anything about the process used?—J. R. L.

Answer.—The process to which you refer as used at Homestead was described by Mr. Ambrose Monell of the Carnegie Company, at the recent meeting of the Iron and Steel Institute in London. He said that "this process avoided the objections of the former methods, and enabled the manufacturer to dispense with steel scrap, or to greatly reduce the percentage of that he used. The process consisted in charging in a basic open-hearth furnace, limestone and a relatively large quantity of ore, heating these, and then charging molten pig metal taken from a mixer, or direct from the blast-furnace. The temperature of the resulting mixture must be sufficiently large to produce a rapid slag formation, and yet low enough to insure the rapid oxidation of the phosphorus." After giving details of the results which have been accomplished at the Homestead Works by this process since February 18th, 1900, Mr. Monell said that 34 heats had been made during two consecutive weeks' run, the average time being 8 hours, and the steel produced 1,380 tons. The important factors in the process were that the proportion of iron oxide charged must be sufficient to dephosphorize the pig at an early stage of the process, and the removal of the major portion of the slag at an early period of the heat; and the advantages were that the use of scrap could be discontinued, as larger tonnage could be produced from pig iron than formerly from pig and scrap, and the operation of charging a furnace was both shortened and cheapened.

Analysis of Boiler Waters.—In a technical water analysis for boilers, the solids per United States gallon, volatile solid matter, non-volatile solids, scale-forming solids and non-scale-forming solids are usually determined. Will you kindly state what constitutes the scale-forming and non-scale-forming matter. The carbonates of lime and magnesium are chief ones, also alumina compounds. What others are usually regarded as detrimental? Would water containing from 15 to 20 grains solids to the United States gallon be considered as scale-forming of any consequence?—G. C. C.

Answer.—The carbonates and sulphates of lime and magnesium are the great scale-forming elements in water. Alumina compounds or clays are not scale-forming. They are deposited in a boiler, of course, but usually in the form of loose deposit or mud, from which the boiler can be freed by simple blowing out or washing out and cleaning. Other injurious elements are free sulphuric acid, or compounds which will disengage free acid under the action of heat. The acid will not form scale, but is highly injurious to the boiler plates and tubes, causing corrosion and consequent weakness.

Whether water carrying 15 or 20 grains of solids to the gallon would be hurtful would depend entirely upon what those solids were. If they are only alumina or clayey matters, that quantity would be of little consequence. If they are lime or magnesium compounds, it might be very injurious.

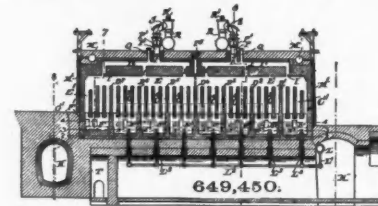
PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

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

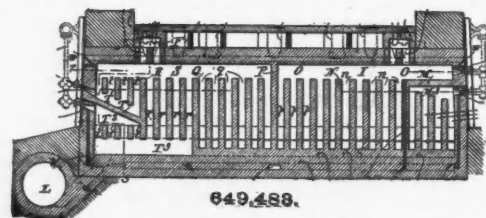
Week Ending May 15th, 1900.

- 649,435. CARBURETER. Roy F. Carter and Richard W. Zierlein, St. Louis, Mo. A suitable closed tank or generator, an air-pipe leading therefrom closed at the top but open at the bottom, a guide-tube confined within the air-pipe and open at both ends, a float-pipe loosely playing in the guide-tube, said pipe being open at the top, the base of the pipe being provided with suitable openings for the escape of the air-currents, an air-supply pipe communicating with the air-pipe above the tank, a gas-delivery pipe leading from a point above the level of the liquid in the tank.
- 649,450. COKE-OVEN. Gustav Hilgenstock, Dahlhausen-on-the-Ruhr, Germany, assignor to the United Coke and Gas Company, Charleston, W. Va., and Philadelphia, Pa. In combination with a series of horizontal externally heated coke-ovens arranged side by side and having heating-flues arranged in their partition-walls and dis-



charging-openings at their ends, a series of parallel tunnels of size sufficient to permit the passage of a man arranged beneath the ovens and heating-flues and parallel with the ovens, gas-conduits as running through and accessibly situated in said tunnels and a series of burner-pipes extending from different points along the length of each of said conduits into the heating-flues.

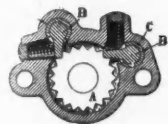
- 649,451. DEVICE FOR DRAWING UP DOORS OF COKE-OVENS. Gustav Hilgenstock, Dahlhausen-on-the-Ruhr, Germany, assignor to the United Coke and Gas Company, Philadelphia, Pa. In combination with a series of coke-ovens arranged in a group, a movable hoisting-drum adjustable along and above the ovens, a hoisting-chain secured to the drum and adapted to engage the doors of the ovens.
- 649,464. ROCK DRILL. Emanuel Lawson, Brewer, Maine. In a rock-drill, a frame, a drill-bar carrying a drill and adapted to operate in the frame, a clutch adapted to operate the drill-bar, a shaft mounted in the frame, a drum adapted to revolve on or with the shaft and having a projection, an arm secured to the shaft and carrying a pin, said pin adapted to engage the projection on the drum to revolve the drum with the shaft.
- 649,473. METHOD OF MAKING WELDED JOINTS. Edwin C. Palmer, Cleveland, Ohio; Ella M. Palmer, executrix of said Edwin C. Palmer, deceased, assignor, by mesne assignments, to the Standard Welding Company, same place. A method of making a joint, consisting in providing a joining-wall with a reinforcement section that forms a clear space between their end portions, welding such ends and another joining-wall together with their metal flowing into said space and there uniting.
- 649,483. EXTERNALLY HEATED COKE-OVEN. Ottomar Ruppert, Essen, Germany, assignor to the United Coke and Gas Company, Charleston, W. Va., and Philadelphia, Pa. In combination with a series of horizontal coke-ovens arranged to receive heat through their



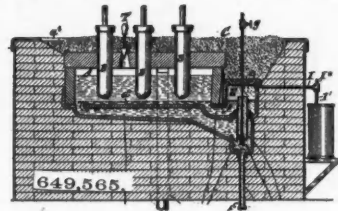
walls and for the saving of by-products, two or more separate combustion-chambers situated between the walls of adjacent ovens, separate gas and air supplies entering each said chamber and a system of flues for products of combustion, connecting with but not passing through the combustion-chambers.

- 649,507. **PROCESS OF MAKING LEAD CARBONATE.** George D. Coleman, Bridgewater, Mass. The process consists in subjecting metallic lead and the successive products therefrom to the repeated actions of an oxidizing reagent and a carbonating reagent, such actions being repeated until all the metallic lead has been converted into lead carbonate.
- 649,516 and 649,517. **FORGING-PRESS.** James P. Kelly, Alexandria, Ind. The combination, in a drop-press, of the usual base, columns, anvil, and hammer, an upper and a lower die having mating matrix-cavities open at the head end, a third die entering the opening which forms the prolongation of the matrix-cavity.
- 649,547. **ROTARY ATTACHMENT FOR ROCK-DRILL PISTONS.** Patrick H. Reardon, San Francisco, Cal. A slotted sleeve socketed in the walls of a grill ratchet-chamber having a ratchet-pawl movably fitted therein.
- 649,550. **ART OF PRODUCING ILLUMINATING-GAS.** Charles L. Rowland, New York, N. Y. The process consists in subjecting metallic chloride to the action of incandescent carbon in the presence of steam, or the products of decomposition of steam.
- 649,565. **PROCESS OF MANUFACTURING CAUSTIC ALKALI AND HALOGEN GAS.** Charles E. Acker, East Orange, N. J., assignor to the Acker Process Company, Niagara Falls, N. Y. The process consists in electrolytically decomposing a molten salt of alkali metal while resting on a body of molten lead constituting a ca-

- 649,782. **SAND-BLAST APPARATUS.** Ambrose G. Warren, Holyoke, Mass. The combination with a hopper suitably supported below a grate, an inclined screen within the hopper, and an opening in one side of the hopper in line with the lower edge of the screen, a base into which the hopper discharges, and a pipe leading from the said base directly to a separator.
- 649,783. **WIRE-DRAWING MACHINE.** Moritz von Watzesch, Oberschonweide, Germany, assignor to Curt Weyhmann, Berlin, Germany. In a wire-drawing machine, the combination with a friction clutch of a sleeve and levers for starting, stopping and regulating motion.
- 649,792. **BRICK-MACHINE.** Russell Anthony, Wortham, Tex. A press-box having movable co-operating parts, mechanism for shifting the side parts to and from each other, means adapted to move an end part of a box in a path at an angle to the path of the side parts, a device for supplying the box with material.
- 649,796. **AMALGAMATOR.** Alfonso Z. Baldenebro, City of Mexico, Mexico. The combination of a rotary amalgamated table, a stationary water-pipe above it, a clamp embracing said pipe, a shaft journaled in bearings rigidly connected with one clamp member, a wedge



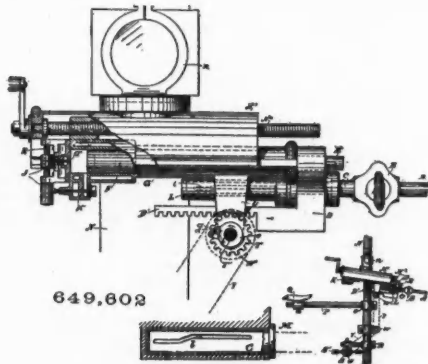
649,547.



649,565.

thode, and thereby forming an alloy of the lead and the alkali metal, circulating the molten body of cathode metal and alloy past an anode or anodes toward another molten body of lead or of lead and alloy, and introducing steam into the last-named molten body below its surface.

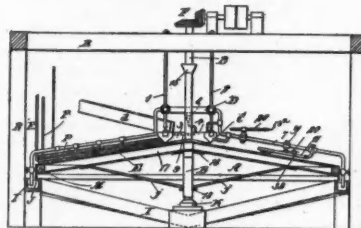
- 649,567. **FURNACE.** Henri J. J. Charlier, Philadelphia, Pa. A cylindrical furnace, having openings at its ends for the entrance of fuel and exit of products of combustion in combination with rotatable flexible loops, supported on overhead pulleys and passing around and supporting the ends of the furnace and means for supporting and shifting in a horizontal plane said supporting-pulleys and the furnace supported thereon.
- 649,602. **ROCK DRILL.** Edward M. Greene and William Brady, San Francisco, Cal. The combination in a rock-drill of one or more power-cylinders having pistons movable therein, a cross-head with which the pistons are connected, a drill carried by the said cross-head



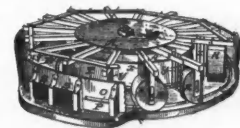
649,602

and movable in unison therewith, an independent mechanism whereby the parts are returned after a stroke has been delivered, and means for advancing the cylinders as the work of drilling progresses.

- 649,617. **HYDROCARBON INCANDESCENT BURNER.** Victor J. Roger, Paris, France. A mixing-chamber comprising a sleeve, having at its upper part a perforated partition through which only light gases can pass, and inlet-pipe leading to the center of said chamber for the mixture of air and vaporized petroleum and at the bottom two tubes, which conduct the heavy gases to an annular heating-burner.
- 649,628. **EXTRACTION OF GOLD OR OTHER PRECIOUS METALS FROM SLIMES.** William A. Caldecott, Johannesburg, South African Republic. The method consists in rendering the material alkaline, then forcing air into the pulp until the ferrous compounds are converted into ferric hydrate, then adding cyanide and continuing aeration and agitation until the precious metals are dissolved.
- 649,636. **APPARATUS FOR DETERMINING DIRECTION OF GRADIENTS OF STRATIFIED MASSES.** Herman Gothan, Goslar, Germany. An apparatus consisting of a boring-cylinder which is usually provided with an oscillating magnetic needle and a clockwork to fix the same at a predetermined moment; of a horizontally-revoluble disk and of two plumbs and two sockets that are both in combination with said disk.
- 649,637. **INCANDESCENT HYDROCARBON-BURNER.** Charles K. Harding, Chicago, Ill.—The combination of a head provided in its lower part with passages in which the fuel is vaporized and superheated and having a central passage for the admixture of the vapor and air and a mantle fitted over the upper end.
- 649,653. **BATTERY COMPOUND.** Henry Blumenberg, Jr., New York, N. Y. A battery charge in a dry state, composed of an organic acid and a chlorate of an alkali or alkali earth metal.
- 649,654. **BATTERY COMPOUND.** Henry Blumenberg, Jr., New York, N. Y. A battery solution composed of sulphate of ammonia and chloride of ammonia.
- 649,749. **PROCESS OF MAKING GAS.** Emil Pilous, Vienna, Austria-Hungary, assignor of one-half to G. Otterman & Co., same place. The process consists in carbureting the crude gases containing carbonic acid by bringing them in contact with calcium carbide, and at the same time removing the carbonic acid from the gas to be enriched.
- 649,750. **PUMP.** Daniel A. Quiggin, Blundellsands, England. A pump comprising a pressure-chamber, a casing, a piston and piston-rod, a valved inlets and a valved discharge-passage.

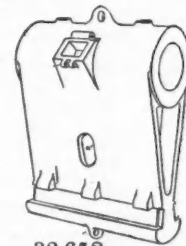


649,796.



649,817.

- projection located upon said shaft and adapted to engage the other clamp member, a guide having a universal joint connecting it with the clamp, a rod slidable in said guide, a branch pipe communicating with said water-pipe but movable relatively thereto, and a supporting connection between said rod and the branch pipe.
 - 649,803. **PNEUMATIC PUMPING DEVICE.** Levi M. Brock and George W. Phillips, Mackinaw, Ill. A pneumatic pumping device, comprising two alternately-operated cylinders which are placed to receive a gravity-supply of water, separate air-supply pipes leading thereto, a double-cylinder air-pump, each cylinder being connected with one of the pipes supplying the water-pumping cylinders.
 - 649,817. **PULVERIZING AND SEPARATING MACHINE.** Charles W. Day, Santa Cruz, Cal. An improved mill for reducing talc and clay ores, comprising a vertical post, a series of radiating arms, hangers pendant from said arms and provided with vertical slots, rollers journaled in said slots, and arranged at different distances from the post, a series of scrapers and stirrers attached to and pendant from the said arms and arranged in radial line with said rollers.
 - 649,852. **EXPLOSIVE.** Alfred Luck, Dartford, England. An explosive containing an explosive organic nitrate and a non-explosive ester of cellulose.
 - 649,855. **SLAG-EJECTOR.** Richard T. Marshall, Toccoa, Ga. A slag-ejector comprising a chamber having water inlet and outlet passages and a hopper having a discharge-pipe extending into the chamber and provided with a valve adapted to open in the direction of the inlet-passage of the chamber to be held normally seated by the water therefrom.
 - 649,857. **ART OF MANUFACTURING TUBES OR PIPES.** Albert L. Murphy, Conshohocken, Pa. The process consists, first, in heating suitable piles or billets and reducing them by a rolling operation into plates; second, in dividing said heated plates into pipe strips; third, in immediately charging said heated strips as fast as cut to a superheating or welding furnace and bringing them to a welding heat; and, fourth, in subjecting said strips while at a welding heat to dies or rolls which fashion them into pipes or tubes.
 - 649,865. **CARBURETER.** Otto Verhagen and Gerardus L. van Gink, Amsterdam, Netherlands. In a carbureter, the combination of a hollow rotary perforated axis open at one end, a chamber having end walls formed with bearings in which the said hollow axis is supported, means for rotating the axis, a series of wooden disks mounted on said axis, a series of sheet-metal bands coiled spirally around the hollow axis and alternating with the wooden disks and means for admitting air and carbureting liquid to the chamber.
 - 649,877. **MEASURE FOR LIQUID GOLD.** Albion M. Rouse, Denver, Colo., assignor of one-half to William G. Shedd and Frank Brooks, same place. In a measure of the class described, the combination of a frame, an opaque casing mounted thereon, a pair of transparent telescoping tubes having closed lower ends, and located within said casing, a sight-tube mounted on said frame, a color-disk movably mounted on said frame, a scale and an indicator-rod adapted to be moved with relation to said scale.
- DESIGN PATENT 32,658. **PITMAN FOR ROCK-CRUSHERS.** Earle C. Ba-



32,658.

con, New York, N. Y. The design for a pitman for rock crushers, as shown in the drawing.

GREAT BRITAIN.

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

Week Ending April 21st, 1900.

- 6,790 of 1899. **MAKING OXIDES OF ALKALI METALS.** F. Projahn, Driesburg, Germany. Method of producing the oxide of an alkali metal by treating the sulphate with metallic iron.
- 11,534 of 1899. **MAGNESIUM PEROXIDE.** R. Wagnitz, Berlin. A method of producing the peroxide of magnesium.
- 21,533 of 1899. **GOLD WASHER.** A. R. Wojciechowski, London. A machine for washing gold gravels.
- 439 of 1900. **COAL CUTTER.** H. Ebert, Chicago, Ill., U. S. A. Improvements in coal cutting machines worked by hand.

PERSONAL.

Mr. Frank Rockefeller of Cleveland, O., has been in California inspecting mining properties.

Mr. E. A. Wiltsie, a prominent mine owner of San Francisco, Cal., has returned to that city from Denver, Colo.

Count des Garets and Viscount de Pare are in San Francisco, en route to Nome, where they have large mining interests.

Mr. H. W. Hardinge returned to Denver, Colo., a few days ago from New Mexico and left again for Arizona to investigate coal and copper mines.

Mr. W. H. Adams has gone to examine two large iron ore properties in Tennessee and Alabama, near Chattanooga; he will be occupied several weeks in this work.

Mr. J. E. Meighan, late of South Africa, is visiting his brother, Mr. J. M. Meighan, who is superintendent of the Mount Jefferson Mine at Big Oak Flat, Cal.

Mr. William Watson, assistant superintendent of the Simmer & Jack gold mine in the Transvaal, has been visiting the copper mines of Upper Michigan.

Mr. T. D. Dale, of New York City, vice-president of the Verde Queen Copper Company, has been in Jerome, Ariz., to inspect the property of the company.

The firm of Luckraft & Countryman, mining engineers at Cripple Creek, Colo., will about June 1st establish a branch office at Grand Encampment, Wyo., where there is promise of a lively copper mining camp.

Mr. R. C. Shaw, superintendent of the Warrington Mining and Milling Company, at Havilah, Kern County, Cal., has resigned to accept the position of general manager of the Bellavista & Thayer Mining Company, in Costa Rica, Central America.

Mr. Forbes Rickard of Central City, Colo., has gone at the head of a party in the interests of the Venture Corporation of London on a trip to the Eastern Siberia coast to examine auriferous gravels. The party will visit Cape Nome, Alaska, on the way to Siberia, and expects to be absent about 5 months.

Mr. W. F. Mattes, well known to many of our readers as for a number of years chief engineer of the Lackawanna Iron & Steel Works at Scranton, afterward engineer and general manager of the West Superior Steel Plant, and also known to many mining men in Colorado, has been appointed chief engineer of the new Pennsylvania & Wyoming Valley Rapid Transit Company.

OBITUARY.

John Hewson, a pioneer miner of California, died at the Lick House, in San Francisco, on May 22d of apoplexy, in his 81st year. He acquired considerable wealth in the San Juan placer mines, and always gave a helping hand to old pioneers, many of whom were staked by him and given a chance to begin life anew.

William E. S. Baker, secretary and treasurer of the Duncannon Iron Company, died on May 16th, at his home in Germantown, Pa., in his 70th year. He was born in Philadelphia, and at the age of 19 years entered the employ of the company, gradually advancing to the position of secretary and treasurer, which he held for about 30 years. He was also at one time president of the Phillips & Townsend Iron Company, of North Penn Junction, Pa. He organized the Atlantic States Nail Association and the Eastern Bar Iron Manufacturers' Association and was secretary of both. These associations flourished for several years in the late 70's and 80's, but long since passed out of existence. Mr. Baker's death was due to a complication of diseases, resulting from the shock of having his right leg amputated after an injury to that member.

Frederick M. Mooers died at the Fifth Avenue Hotel, New York City, of heart disease on May 26th. He was born in Ithaca, N. Y., and for many years lived in Brooklyn, where he was employed in the business office of a Brooklyn newspaper. One of his hobbies was metallurgy, and he was continually talking about going West to try his luck at mining. He lost his position in 1890, and with but little capital started for California. He drifted about from one mining camp to another, and for months worked for a newspaper in Los Angeles at a small salary. In 1892 he joined some placer miners on the border of the Mojave desert. He earned \$1.50 a day as a laborer for a while, and prospected on his own account between jobs. Finding some free gold specimens, and marking his claim, he went to Los Angeles and obtained capital to develop his find. He called it the Yellow Aster. The mine is at Randsburg and is said to have produced \$1,300,000. Mooers owned a half interest. He also owned other properties. He had a fine

residence in Los Angeles, and recently purchased a hotel at San Diego. He leaves a widow.

SOCIETIES AND TECHNICAL SCHOOLS.

Engineers' Society of Philadelphia.—At the meeting on May 19th there were 38 members and visitors present.

Mr. William Easby, Jr., presented a paper upon the "Bacterial Treatment of Sewage in England." After describing the chemical composition of sewage, he gave the methods of sewage purification, especially by septic tanks and filter beds. The principal plants of this character in England and in this country were described and illustrated by a series of lantern views. After the reading the subject was discussed by Messrs. Henry Leffmann, P. J. A. Maignen, L. Y. Schermerhorn, and others.

American Chemical Society.—The 21st general meeting of the society will be held in New York City, Monday and Tuesday, June 25 and 26, in connection with that of Section C of the American Association for the Advancement of Science. The opening session on Monday will begin immediately after the organization of Section C. Dr. Charles F. McKenna, Chairman of the New York Section of the American Chemical Society, will address a few words of welcome to the visiting chemists. This will be followed by responses by Dr. William McMurtrie, president of the society, and Prof. James Lewis Howe, vice-president of Section C.

In the afternoon the society will convene at 2 p. m., adjourning in time to give the chemists the opportunity of listening to the address of the vice-president of Section C. At the close of this address, the Council of the American Chemical Society will meet at some convenient place to be announced hereafter. On Tuesday the morning session will begin at 10 with a brief welcome by Mr. T. J. Parker, of the Chemists' Club. The remainder of the session will be occupied by the reading and discussion of papers. The afternoon session will be held in the same place, beginning at 2. The New York Section of the American Chemical Society will provide a "smoker" for the visiting chemists in the assembly hall of the Chemists' Club either upon Monday or Tuesday evening.

The Chemists' Club extends to all visiting chemists the full privileges of the club during the week beginning June 25th.

Society of Chemical Industry, New York Section.—At the meeting on May 25th the meeting was opened by the chairman, T. J. Parker, who announced the election of: Clifford Richardson, chairman; Virgil Coblenz, vice-chairman; R. C. Woodcock, treasurer; H. Schweitzer, secretary, and five new members on committee—Durand Woodman, Robert C. Schuepphaus, Louis Fade, George N. Williamson, George H. May—in place of the following 5 members: M. Toch, George A. Prochazka, C. E. Pellew, Harold Binney, Samuel A. Tucker. Messrs. Klein and Peckham presented a paper on "Cement Testing." Mr. Klein is the engineer of the Commissioners of Account, in New York, and Prof. Peckham, chemist of the Commission. The paper showed with what skill materials used by the city are tested before being used. An interesting discussion followed, in which Dr. McKenna, Mr. Haus and Mr. Cook took part.

Mr. Arthur Van Gelder then read his paper on "The Analysis of Nitric Acid in the Manufacture of High Explosives." A number of chemists of smokeless powder works, such as Dr. Volney, Mr. Pitman and others, as Dr. Hewitt, Dr. Endemann, Dr. Schweitzer, took part in the discussion.

Dr. Endemann demonstrated the Berkefeld filter, used in the armies of the civilized world for the filtration of water from pools, rivers, etc., converting polluted liquids into germ-free drinking water. Mr. White's paper on "American Gas Tar" was read by title, owing to the late hour.

The next meeting will take place October 19th.

INDUSTRIAL NOTES.

The charcoal furnace at Manistique, Mich., went into blast May 17th.

The new cement works 6 miles from Florence, Colo., are completed and will soon be turning out 250 to 300 bbls. of cement per week. The little village at the works will be known as Portland.

The Cardenas & Jucaro Railroad, of Cardenas, Cuba, has placed a contract with the Rogers Locomotive Company, of Paterson, N. J., for 3 mogul engines and 1 eight-wheel switching engine.

The Baldwin Locomotive Works of Philadelphia, Pa., is about to ship to Bordeaux, France, 10 locomotives for the Paris & Orleans Railway. Twenty more engines for the same road are under construction.

Mr. W. E. Corey, superintendent of the Home-

stead Steel Works of the Carnegie Steel Company, is now in control of the Carrie blast furnace plant of the Carnegie Steel Company at Rankin, and will hereafter supervise the 2 plants. The Carrie plant is located across the river from the steel works.

The Monarch Gas Engine Company, Indianapolis, Ind., has been incorporated with the following officers: President, P. K. Buskirk; secretary, Fred Matthews, and general manager, J. E. Matson. The product will be gas engines, 1 to 100 H. P., electric machinery, dynamos, and belted pumps for gas engines.

The Edward P. Allis Company of Milwaukee, Wis., through its Denver office, has secured a contract with the Camp-Bird Mines Company of Ouray, Colo., for a cyanide mill of 100 tons daily capacity. This mill is to be erected below the 40-stamp mill built by the Allis Company, and will be in operation before long.

The White Manufacturing Company, of Chicago, has moved into its new building, 192-194 Michigan Street, owing to increasing business. It has trebled its capacity for the manufacture of the hot blast line of torches, brazers and enameling ovens. It is now prepared to fill orders promptly. The firm has also taken the Western agency for the Standard Gauge Manufacturing Company, of Syracuse, N. Y., and will also carry a full line of brass goods, sheets, rods and tubes.

The Jeanesville Iron Works Company, of Jeanesville, Pa., through its Denver branch, A. Middlebrook, manager, has contracted with the Rialto Leasing and Mining Company to furnish a compound condensing pump, capacity 900 gal. per minute, 1,000 ft. high. This pump is its latest pattern, fitted with Corliss steam valves for economy of fuel. The stroke is 3 ft. The condenser is the duplex pattern. The company also sold Bassick Mines Company, of Silver Cliff, Colo., duplex pump, 900 ft. lift.

A corporation, with a capital of \$1,500,000, called the Canadian Portland Cement Company, has been formed to take over the interests of the Rathbun Cement Company of Napanee and Maribank, of the Beaver Portland Cement Company of Maribank, and of the St. Lawrence Cement Company of Montreal, Canada. The directors of the new concern are: E. W. Rathbun, Deseronto, president; F. G. B. Allan, Napanee Mills, managing director; James Dobson, Philadelphia; M. J. Haney, W. D. Matthews, B. E. Osler, C. A. Masten, Toronto; C. J. Webb, Philadelphia.

The Wefugo Company of Cincinnati, O., states that in the last 2 months it has received orders for its water-softening plants from the following firms: Cincinnati, Hamilton & Dayton Railroad Company, Ottawa, O., capacity 100,000 gals.; Detroit & Pontiac Railway Company, Birmingham, Mich., capacity 48,000 gals.; Columbus Iron and Steel Company, Columbus, O., capacity 172,000 gals.; Globe Iron Works, Jackson, O., capacity 76,800 gals.; Tonawanda Iron and Steel Company, Tonawanda, N. Y., capacity 384,000 gals.; Iroquois Iron Company, South Chicago, Ill., capacity 384,000 gals.

The Clayton Air Compressor Works, of New York City, states it has recently perfected a new type of duplex belt compressor, built in small and intermediate sizes, and embodying all the latest improvements. The company has recently equipped 5 plants of the Brooklyn Heights Railroad Company with compressors and pneumatic hoists, also the Grasselli Chemical Company, General Chemical Company, De La Vergne Ice Refrigerating Machine Company, Union Brewing Company, Gill Machine Works, White Machine Shops, etc. Their export trade has more than doubled and they are shipping compressors to England, Germany, Russia, France, Italy and Japan. Many orders are being received from Mexico and South America.

The Nordberg Manufacturing Company, of Milwaukee, Wis., has some heavy machinery contracts on hand. These include a triple-expansion horizontal pump with a capacity of 11,000 gals. per minute for the Isle Royale mill at Houghton, Mich. This pump is of special design for handling muddy water, the plunger being supported outside, so as not to touch the barrel. The company is also building 2 stamp heads with a daily capacity of 550 tons of copper rock for the Baltic mill, near Houghton, Mich.; a 1,300-H. P. blowing engine for the Great Falls smelter, of the Boston & Montana Company; a 400-H. P. underground pumping engine for the same concern; a 1,100-H. P. triple-expansion blowing engine and a 1,500-H. P. mill engine for the smelter at Anaconda, Mont., and 2 large pumps for the South Chicago plant of the Illinois Steel Company, with a capacity of 27,000 gals. per minute each. One of the big tools of the Nordberg shops is a lathe that will turn fly wheels 30 ft. in diameter; another is a boring machine that will bore a barrel of 120 in. diameter.

The manufacturers of automatic cut-off engines have formed an association under the name of the Engine Builders' Association of the

United States, the objects of which are the promotion of the interests of the engine trade by the advancement of engineering knowledge and practice; co-operation in matters of mutual interest; the correction of abuses; promoting economy in operation, etc. Individuals, firms or corporations possessing a capital of at least \$10,000, engaged in the manufacture of automatic cut-off engines, are entitled to not exceeding three memberships in the association from each concern, who shall be principals in the case of individuals or firms, and officers in the case of corporations, superintendents and general managers being eligible. The officers for 1900 are: President, J. E. Sweet of Straight Line Engine Company, Syracuse, N. Y.; vice-president, W. M. Taylor, of Chandler & Taylor Company, Indianapolis, Ind.; treasurer, H. L. Ide, of A. L. Ide & Sons, Springfield, Ill.; secretary, S. F. Bagg, of Watertown Engine Company, Watertown, N. Y.; members of council, W. R. Fleming, of Harrisburg Foundry and Machine Company, Harrisburg, Pa.; C. A. Gates, of Russell & Company, Massillon, O.; Thos. C. Wood, of Ball & Wood Company, New York City; S. B. Richards, of Buckeye Engine Company, Salem, O.; John Dick of Meadville Iron Works, Meadville, Pa.; and Leonard Ames of Ames' Iron Works, Oswego, N. Y.

TRADE CATALOGUES.

The Joseph Dixon Crucible Company, of Jersey City, N. J., issues illustrated folders calling attention to Dixon's silica-graphite paint as a protective coating for tin roofs and for structural steel work.

The Wood steam stamp mill, for which claims of low cost, portability and efficiency are made, is described in an attractive 15-page illustrated catalogue published by H. A. Newkirk & Company, of Chicago, Ill.

The Bethlehem Steel Company, of South Bethlehem, Pa., issues a finely illustrated pamphlet of 108 pages, showing many features about the company's plant, and some of the forgings for ordnance, armor plate, shafting, etc., that have been turned out.

The Forbes patent die stocks, portable hand machines, which, it is stated, can cut off and thread pipe up to 12 in. diameter, and is recommended as particularly suitable for trench work, are described in pamphlets issued by Curtis & Curtis, of Bridgeport, Conn.

Bliss-Heath vacuum pumping engines for domestic supply or pumping from deep wells are described in a pamphlet sent out by the Bliss-Heath Company, of Brooklyn, N. Y. These pumps, it is stated, can be operated by unskilled labor and are not liable to get out of order.

K. G. concrete mixers of the cube type, either stationary or semi-stationary, are described in illustrated folders sent out by Kaltenbach & Griess, of Cleveland, O. The mixers are built in 2 sizes, 4 and 5 ft. cubes for 1 yd. and 1 1/2 yd. batches. The capacity is stated to be 12 to 15 batches per hour.

The Latrobe Steel Company, of Latrobe, Pa., in a cloth-bound booklet of 14 pages, gives information concerning the locomotive and car wheel tires and the forged and rolled steel crusher rings it manufactures. The company states that its plant is probably the only one in the world specially designed for the manufacture of steel tires for locomotive and car wheels. The various steps taken to insure the quality of the company's products are described at length.

Sturtevant Electric Fans are described in Bulletin H, issued by the B. F. Sturtevant Company, of Boston, Mass. These fans include two types, "Monogram" and "Steel Motor." The former is for handling moderate volumes of air at pressures varying from 1 to 5 oz.; the latter creates higher pressures, but handles comparatively smaller volumes of air, and is principally for cupola furnaces. Another fan, the "Steel Plate," is used for ventilating; also to remove sawdust shavings, etc. The "Monogram" and "Steel Pressure" fans are fitted with bipolar enclosed motors.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the "Engineering and Mining Journal" 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 of any kind, and shall be pleased to furnish them information, catalogues, etc. 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, and have no pecuniary interest in buying and selling goods of any kind.

GENERAL MINING NEWS.

ALASKA.

Douglas Island.

Alaska-Treadwell.—The new mill will take 1,000,000 ft. of lumber, which will be supplied by a Seattle concern. It is expected that by October 1st 1,000 stamps will be dropping on Douglas Island, and that by the summer of 1901 over 1,500 men will be on the company's pay roll.

Ebner Gold Mining Company.—This concern is running a 10-stamp mill in lower Silver Bow basin, near Juneau, under the management of W. M. Ebner, the principal owner and president of the company. The mine is in a most prosperous condition. Extensive development work has been done during the past four years, including the erection of a new mill, which is nearly ready for placing the machinery, a new duplex drill compressor added, new flumes constructed, and pipe lines put in, as well as a large amount of tunneling, tramway construction, etc.

ARIZONA.

Santa Cruz County.

(From Our Special Correspondent.)

Pride of the West.—This mine, about 30 miles, is reported to have a vein 55 ft. wide, carrying silver, lead, zinc and copper. R. Wilfley, inventor of the Wilfley table, is interested in the property and an 80-ton plant designed by him has been at work a year successfully. The ore is crushed and run through a stamp mill and over Wilfley tables which separate the silver and lead, the concentrates yielding 50 per cent lead and 100 oz. in silver per ton. The tailings from the concentrates are then roasted and passed to Wetherill magnetic concentrators, which separate the copper and zinc, the resulting material being composed of 24% copper and 56% zinc. The zinc is shipped to Europe. The company, it is said, is preparing to erect a 400-ton mill on the same principle, and may build a matte smelter at Nogales. Denver men are interested.

(From Our Special Correspondent.)

The smelter at Patagonia is being examined by Richard Eames, Jr., who was formerly manager for Eastern parties. Mr. Eames is developing several properties in the vicinity.

Hardshell Mine.—The concentrator at this mine is running day and night, producing a high grade silver-lead product, which is shipped to the smelter at El Paso, Tex. R. R. Richardson of Patagonia, Ariz., is president and general manager.

Santa Rita Mining Company, Consolidated.—This is a Cincinnati, O., company, which is operating several claims in the Salero District and shipping ore to the El Paso smelter. Wilkie Woodward, a son of Col. Woodward, editor of the "Cincinnati Enquirer," is superintendent.

World's Fair.—This mine, owned and operated by Frank Powers of Harshoe, continues to ship silver-lead ore. The last car load returned \$14,200. The mine is the bonanza of the Patagonia District and has large reserves in sight. It has been a paying producer since 1894.

CALIFORNIA.

Mr. Charles G. Yale, statistician State Mining Bureau, furnishes the following data of the petroleum production of certain California counties for the year 1899:

	Barrels.	Value
Fresno	439,372	\$439,372
Kern	15,000	15,000
Los Angeles	1,409,356	1,409,356
Orange	108,677	108,677
Santa Barbara	208,370	191,288
Santa Clara	1,500	3,000
Ventura	496,200	496,200
Totals	2,677,875	\$2,660,793

The valuation shows an average of \$1 per barrel, which seems a little high.

Amador County.

(From Our Special Correspondent.)

Balliol.—On the 500 ft. a 16 ft. ledge of high-grade ore has been encountered. The shaft is now down to the 600 ft. and a station is being cut. This shaft will be continued to the 700 ft. A new hoisting plant has been ordered and new buildings will be erected. S. R. Porter is superintendent, employing 30 men.

Central Eureka.—The last run of ore sent to the Zeile Mill from this mine yielded about \$90 per ton. The new 10 stamp mill is to be completed about July 1st. The shaft is down almost 1,700 ft. W. R. Thomas is superintendent.

Lincoln.—The 1,200-ft. level has been extended 75 ft. west during the past 30 days, making the total distance of the cross-cut from the center of the shaft 258 ft. The south cross-cut west of the 500-ft. level has been extended 52 ft.; total distance, 398 ft. Work will begin on the north cross-cut and ore will be stoped and milled.

South Mayflower.—The old shaft, down 800 ft., has been cleaned out to 350 ft., and work is progressing at the rate of 100 ft. per month. This old mine on the north side of Amador City is considered a good property, although it has been idle for 4 years.

Calaveras County.

(From Our Special Correspondent.)

Lone Star.—Work on this property, 2 1/2 miles northwest from West Point, has started up again and the shaft will be sunk to the 500 ft. on contract. A hoist and other machinery is being put in.

Inyo County.

(From Our Special Correspondent.)

It is reported that the antimony deposit owned by Frank Kennedy at Wild Rose has been sold to Montgomery & Dineen, and that the first payment of \$1,000 has been made.

Mineral Hill.—The tramway in course of construction at this mine, 4 miles south from Ballarat, will be completed in a few days, when the new mill will start up. The cyanide plant has been completed.

Kern County.

(From Our Special Correspondent.)

Randsburg District.—A half interest in the Meteor Mine, near Randsburg, has been sold, and development work will be pushed. About 800 ft. of work has already been done, exposing a large body of low-grade ore. A hoisting plant is to be installed at once.

The W. J. Bryan Mine is producing some very rich ore, which is being milled in the Kenyon Mill, leased by the company.

Yellow Aster.—At the last annual meeting of the stockholders of the Yellow Aster Mining Company, the old board of directors was elected for the ensuing year. The output of the mine has been about 140 tons per day. The camp now has plenty of water to keep all the mills in the district running day and night. The flow from the company's wells at Mountain Wells is said to be 40,000 gals. per days.

Nevada County.

(From Our Special Correspondent.)

Baltimore.—This group of mines, 23 miles north from Elko, in the Marriam District, has been bonded by A. H. Tarbet, of Salt Lake, who represents Salt Lake and Eastern capital. The price is said to be \$50,000.

Reward Gold Mining Company.—This company has decided to put in an electric power plant for the mill and other machinery. A 120-H. P. dynamo and other machinery will be installed very soon.

San Bernardino County.

(From Our Special Correspondent.)

Copper Camp.—This camp, 25 miles west of Manvel, is producing high-grade copper ore, which is shipped to the El Paso smelter. A group of copper claims just south of Copper Camp is under bond to A. E. Heighway, who is getting out high grade ore.

Copper World.—There are about 1,200 tons of ore blocked out for extraction. Two tunnels are now being pushed to find the ore body at greater depth. One of these tunnels is to be 800 ft. long and the other about 400 ft.

During the life of this mine, with a total production of about 11,000 tons, the ore has averaged 13.5 per cent copper, and a ton of ore has been extracted per man per day. A 20 mule-team hauls 35 tons on an average at each load from the mine to the smelter, a distance of 5 miles. Unless the development work reaches more ore than is now in sight the smelter will be compelled to close down within perhaps 6 weeks. This company has been greatly handicapped in its mining by a most harassing law suit, preventing many improvements and much development work.

Turquoise mining is being pushed by several operators and fine gem material is produced. The mines are tributary to Manvel.

San Diego County.

(From Our Special Correspondent.)

Live Oak.—This group of mines near Fallbrook is to be developed by the Santa Margarita Mining Company, which has been organized with a capital stock of \$2,000,000. The incorporators and directors are: C. E. Armstrong, D. W. Shepard, C. W. Baldrige, John Baird, B. T. Shepard, H. V. M. Armstrong, A. O. B. Baldrige.

Shasta County.

(From Our Special Correspondent.)

Bully Hill.—On this copper property 20 of the 60 roasting stalls being built are completed and work on the others is progressing rapidly.

Texas.—The 2 cable tramways are completed across the river and ore is being conveyed to the railroad for shipment to the Keswick smelter.

Siskiyou County.

(From Our Special Correspondent.)

The hydraulic mines having plenty of water at present, large quantities of gravel are worked. The river miners are getting ready to put in wing dams along the Klamath River, which is quite low, and will remain so during the summer, as there is very little snow on the mountains.

Blue Jay & Sterling.—Two mortars for the Sterling Mill have been shipped in, and the 32

men who have been building the 5-mile road from Hilt Mine to the Blue Jay have completed the work. A 60-H.-P. boiler and a saw-mill plant are on the way to the Blue Jay and arrangements are being made to erect a 10-stamp mill. S. J. Forge is the owner and manager of these 2 properties on Hungry Creek, about 9 miles west from Cole's Station.

Original Greenhorn Blue Gravel.—The new shaft has reached bed-rock at 80 ft. and the gravel prospects rich. A large force of men is at work and will undoubtedly take out good pay. The mine is located 1½ miles south from Yreka.

Tuolumne County.

(From Our Special Correspondent.)

Driesam.—Sinking on this mine at Arastraville has been resumed and other underground development work will be carried on. At present the mill is running on ore from the Partington Mine.

Spring Gulch.—This mine, 2½ miles southeast from Carters, has been bonded to M. Arendt of Stent, who will erect a mill and continue the shaft down to the 600 ft. before a station is cut and crosscuts are run.

COLORADO.

Chaffee County.

Annie C.—Colorado Springs men some months ago bought this property, 5 miles northeast of Buena Vista, for \$40,000, it is said. The former owners had erected a mill and showed up a large body of low-grade ore. The new owners have remodeled the mill and will soon have it running.

Wild Horse.—This group, 3 miles from Buena Vista, is being put in shape for production by Dean, Brown & Morley.

Gilpin County.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—J. S. Kneale to A. Kneale, et al., the Morning Star lode; M. J. Duncan to Travis Gulch Mining and Milling Company, ½ int. in Ulysses lode; R. A. and G. D. Duncan to Travis Gulch Mining and Milling Company, 14 lode claims, Travis Gulch and Gold Gulch placers, Travis Gulch mill site; H. Niccum to C. E. Hornbeck, 1-3 interest Mountain Beauty lode; M. Healey to P. Reid, ½ interest Bryan lode; J. M. Pine to F. G. Patterson, ½ interest Poole group, 4 claims; J. Dohoney et al., to W. C. Le Prouse et al., the Last Chance lode.

Calumet Gold Mining and Milling Company.—A 10 by 4 by 10 Snow pump is being installed, and the company intends sinking another lift of 100 ft. Daily shipments of 40 tons are made to the Idaho Springs concentrators, and the smelting product promises to become a feature. J. B. Phillips, Russell Gulch, Colo., is manager.

Albert.—An Arrington & Sims engine and boiler has been placed on the property, which has a tunnel now in over 400 ft. Chicago parties are interested. J. J. Reilly, Central City, is manager.

Bonanza.—Shipments of mill ore bring 2 to 3 ozs. gold per cord; smelting ore, \$45 to \$150 per ton. The property is worked for Eastern company by S. A. Rank, Central City, as manager, all work being on the leasing system.

Gladstone.—Mill ore returns show values of 4½ ozs. gold per cord with tailings yet to hear from. The ore comes from less than 200 ft. and the property is operated by the Gilpin & Boston Gold Mining and Milling Company.

Gold Collar.—A new rope 900 ft. long has been put on drum of engine and milling has been resumed at 500 ft. Mr. Hooper, of Central City, is manager.

Good Luck.—A 12 H. P. gasoline hoist, Fairbanks, Morse & Co. make, has been installed and new shafthouse erected. The shaft, now 40 ft. deep, will be sunk considerably deeper. J. W. Holman, Central City, is manager.

Rare Avis.—Cripple Creek parties, Wright & Company, are doing development work and are going to install a hoisting plant or main shaft, which is nearly 600 ft. deep. Philadelphia parties are interested.

Mechanics.—This property is owned and operated by Henry Bolthoff, of Hendrie & Bolthoff, of Denver. A new first motion hoist is to be put up and development carried on extensively.

Rapidan Gold Mining & Milling Company.—Work has been resumed again, sinking at 600 ft. Some milling ore is being taken out. Pittsburg, Pa., capital is interested.

Receipts of Machinery.—Two cars for Boston & Denver Mining and Milling Company; a 25-H. P. hoist and boiler for Eureka Mines Company; a 25-H. P. hoist and 30-H. P. boiler for Gettysburg Mining and Development Company; a 12-H. P. gasoline hoist for Good Luck Mining Company.

Lake County.—Leadville.

(From Our Special Correspondent.)

Smelter Situation.—It is stated that the Union and the Bimetallic plants of the American Smelting and Refining Company will close down as soon as they smelt up the ore on hand. The

managers state that the closing down is due to a shortage of silicious ores and a shortage of coke, and that advantage will be taken of the shut-down to make improvements. There are rumors that there are other reasons for the shut-down, but nothing further can be learned than above stated.

Arnold Leasing and Mining Company.—Manager H. B. Collins is putting machinery in place and building a power house preparatory to making this new lease, which includes the Last Rose of Summer, Emmet, Washington and Robson claims, about 35 acres. Work will be begun in the Last Rose of Summer shaft at a contact at 465 ft. Another shaft on the Washington lode has reached 50 ft. The company is incorporated under the laws of New Jersey, headed by Boston people and capitalized for \$250,000.

A. Y. & Minnie.—Lessees Douglass & Newton are running about 75 tons per day through their concentrating mill, making a good concentrate of 25 tons daily. In addition to this they are shipping 35 tons per day of good carbonates and sulphides.

Boston Gold-Copper Smelting Company.—Manager Duvall has gone to Boston to complete final arrangements for increasing the capacity of the company's pyritic smelter. It is the intention to erect 2 more furnaces, which will give the company a capacity of 1,000 tons per day, against 300 tons now produced. The people are using the Loder process.

Golden Eagle Mining Company.—This company announces a dividend of 1c. a share on the total stock of \$500,000, payable June 1st. It has extensive interests on Breece Hill, but no company work is done. The dividend comes from royalties received from the Vinnie Mining Company, which is shipping steadily grade ore.

Leadville Home Mining Company.—A dividend will be paid June 1st of 50c. a share on the total stock of \$50,000. The company is shipping 400 tons per day of iron ore. It is not thought that the consolidation of the Home and New Leadville Companies will be attempted, as was expected, at the coming annual meeting, owing to serious opposition.

Mahala Mining Company.—The filing of a suit in equity by a number of the minority stockholders promises to involve this old-time property in tedious litigation. The Mahala is one of the historic properties of the camp and it was through it that the Graham Park slope of Carbonate Hill section is now shipping thousands of tons of ore.

Napper-Tandy.—This claim, which has not been worked since the early days, has been leased to Denver parties, who expect to put down a new shaft.

Poverty Flat Mining Company.—Aspen men, headed by D. R. C. Brown and others, are pushing work on the Jason claim, while new machinery is being put in on the Seeley shaft, preparatory to sinking. Shipments will soon begin from the Jason claim.

Rialto Leasing & Mining Co.—The Pyrenees shaft is to be fitted out with a compound condensing duplex pumping plant with a capacity of 900 gals. against 1,000 ft. Work on the new station at 1,000 ft. has already begun.

Thespians.—This property on the Graham Park Slope of Carbonate Hill is to be explored with diamond drill. The old Thespians shaft, sunk 20 years ago, is 600 ft. deep. Over 5,000 ft. of drifting has been done between the 565 and 600 ft. levels. Some ore has been shipped from the first contacts, but water caused much trouble. It is now intended to locate the ore bodies of the lower contact.

Valentine Mining Company.—This company has 105 acres of ground on Brooklyn Heights under 10 years' lease, and has its entire machinery about in place preparatory to sinking the old Weber shaft from 208 ft. to the lower contacts.

San Juan County.

Sultan Mining, Smelting and Power Company.—This concern proposes to furnish power for the mines on Sultan Mountain, in the Silverton District, and also develop claims by long tunnels. G. A. Brouillet of Boston, the promoter, it is stated, has had surveys made and secured water rights on the Animas River, between Rockwood and Silverton, for a 5-mile flume, with a power plant at Rockwood. The company has under bond and lease 20 claims on Sultan Mountain. Two tunnels have already been started to cross-cut the King lode and other veins. The lower tunnel, which is the lowest working on Sultan Mountain, will intersect the entire group, and when completed will be more than 2 miles long, tapping the formation at a depth of nearly 3,000 ft. The project will require about 5 years for completion.

Teller County.—Cripple Creek.

(From Our Special Correspondent.)

Anaconda Gold Mining Company.—A circular recently issued states that the company is in debt \$122,000 and is without funds to meet this indebtedness. The circular also asks for a voluntary contribution of 15c. per share to meet the obligations of the company and gives the privilege of withdrawing unless 95% of the stock-

holders agree to the contribution. It would seem almost impossible with such a widely scattered stock as the Anaconda to get the consent of 95% of the stockholders, but if something is not done soon the property will have to be sold to satisfy creditors. The company owns about 150 acres of patented land on Gold Hill, worth many times the indebtedness. The Alamo Company recently sold 10 acres of ground adjoining it for \$50,000. The situation is watched with interest. The company has done an immense amount of work and shipped a great deal of ore, but has never been in very good condition financially.

Calhoun Gold Mining Company.—This company has brought suit against the owners of the Triumph claim, asking that the latter be restrained from taking ore from a certain vein, of which this company has held the apex. The Triumph claims that its vein is not the same as the Calhoun company's. The suit bids fair to assume quite large proportions. The Calhoun's claim is known as the Victor Consolidated. Both are on Battle Mountain.

Pharmacist Consolidated Mining Company.—Nothing further has been heard in regard to the rumored sale of this property on Bull Hill. A 2 years' lease has just been granted to reliable parties. This is one of the oldest shippers in the district.

Strong Gold Mining Company. This company at Victor is soon to close its mine for a while, in order to put in new machinery. It is one of the big mines of the district, and is in litigation with the Portland in regard to certain vein rights.

DELAWARE.

New Castle County.

Hockessin Kaolin Company.—This company has been incorporated with \$100,000 capital stock to develop deposits of kaolin and fireclay, near Hockessin.

FLORIDA.

Marion County.

Southern Phosphate Mining Company.—Development work is in progress on the properties at Early Bird. About 15,000 tons is to be mined this year. The officers are: President, Isaac Brereton; Vice-President, Fred W. Howard; Secretary, Charles S. Adams. The office is in Jacksonville.

IDAHO.

Custer County.

Ramshorn.—This mine, at Bayhorse, is called the deepest and best developed copper-silver mine in the State. The principal value is silver, and of late years but little work has been done except development. Two pay shoots occur on either wall of a zone of crushed slate, the shoots being 6 in. to 5 ft. thick. The principal gangue materials are brown and gray carbonate of iron mixed with chloride of silver and gray copper. The largest tunnel is 3,000 ft., and gives, it is said, a vertical depth of 3,000 ft. at its face.

Skylark.—This mine adjoins the Ramshorn, and it is stated to have shipped \$25,000 worth of ore last year. It is developed by adits, the longest being 2,400 on the vein.

Idaho County.

Big Buffalo.—The State Supreme Court recently reversed the judgment of the Second District Court in the case brought to establish a grub-stake interest in the Big Buffalo and the Merrimac and Oro Fino claims in Buffalo Hump District. The judgment of the district court in favor of the plaintiffs, Jacob N. Rice and Perry Mallory, for a ½ interest in the property, the claim being based on an alleged oral contract with the locators, is reversed on the ground that the evidence was not sufficiently clear and certain to establish the claimed trust. The defendants B. R. Rigley, Dell Butterworth and Dell Butterworth as administrator of the estate of C. F. Robbins, A. F. McKenna, Florence Young and Michael Green, while John C. Moore, Harry M. Glidden and Margaret P. Glidden were intervenors. The property was located by B. R. Rigley and C. F. Robbins in 1898. The plaintiffs claim that Mallory gave the information respecting which they made the location and that Rice furnished the tools and supplies, it being understood that all were to share alike. Robbins sold an interest to McKenna and the latter sold a part to Butterworth and Green. Rigley sold an interest to Butterworth and Young. The Gliddens intervened on the strength of a contract for the purchase of a share of Rice's interest and Moore intervened claiming to have a contract for a portion of the interest claimed by Rice. Rice and Mallory defaulted as to the Glidden intervention but the complaint of Moore's was answered by Rice, the Gliddens and the defendants.

Washington County.

(From Our Special Correspondent.)

The work on the Conglomerate, the Abbie, the Brown, the Climax and others during the winter all go to show the camp to be a good concentrating proposition. On the silver-lead belt the work on the Hercules has gone on without interruption, and they may open a mine. They are preparing a trial shipment to go to the Salt Lake smelters.

Heath District.—The Homestake, which is being developed by the promoters of the Pacific & Idaho Northern Railway, has put in a steam hoist, and proposes sinking 300 ft. and developing thoroughly before putting in a reduction plant.

Railroad.—This group, under bond to Boston parties, has pushed work all winter, and it is understood that bodies of low-grade pyritic ore have been opened up.

Mineral District.—Two new strikes are reported, one of which may be of considerable importance. This has always been an iron-silver camp and two smelters were busy until silver dropped below 80c. Recent sinking has passed through this formation and the iron has partly given way to copper pyrites, apparently in large bodies. The other is a high-grade copper glance, but the quantity has not been demonstrated.

IOWA.

Des Moines County.

Des Moines Coal and Mining Company.—This company is working a mine at Marquisville, said to be the largest in Iowa, and is preparing to open another big mine about a mile north of the present mine. The vein is considered one of the best in the district, and has resulted in the Des Moines Company securing the largest railroad contracts held by any one company in Iowa. A 3-cage shaft, with a hoisting capacity of about 800 tons of coal a day, will be put down, entries will be driven from this in several directions, and from 2 to 4 shafts put down at once. The mine will employ about 300 men.

MAINE.

Piscataquis County.

Merrill Slate Quarry.—The big slide at this quarry, at Brownville, recently, will stop the production of slates for 6 months or a year.

State of Maine.—After an idleness of some years, this quarry, in Blanchard, is now being worked by L. A. Bartlett and R. J. Jones, of Monson, under a 5 years' lease.

MICHIGAN.

Copper.—Houghton County.

Atlantic Mining Company.—F. W. Denton has been appointed assistant superintendent of this mine and will assume the duties of his position June 1st.

Arcadian Copper Company.—The old shaft on the St. Mary's property has been pumped dry and is found to be 120 ft. deep. At the first level a drift running south for 150 ft. has been found. A 3-drill compressor is at the location and drifting will begin as soon as possible.

Calumet & Hecla.—This great mine at Calumet is now on fire. The fire started in No. 2 Hecla shaft, some 5,000 ft. or so down the incline, on May 27th, and all openings to that part of the mine have been closed as far as possible. The risk of fire, owing to the great amount of timber used in the miles of drifts, is great, and the management is always on the watch for any incipient blaze. The last fire in the mine lasted several months. It started in August, 1888, and was thought to be completely extinguished in January, 1889, but it broke out again, and burned till May, 1889. Since then the company has made special provisions for confining fires by building many bulkheads and fire doors, but unfortunately when the present fire started, gas overcame the men before all the doors were closed and consequently there is a chance for the fire to spread. Seven of the 12 shafts on the Calumet conglomerate are closed and the company has decided to close all openings except South Hecla and try to extinguish the fire by forcing down immense quantities of carbonic acid gas. A kiln for generating gas was erected for the fire in 1898. Some 3,000 men are now idle. The only shafts liable to be worked until the fire is out are the four on the Osceola amygdaloid. It is impossible to say how long the fire may last.

Elm River Copper Mining Company.—An amygdaloid outcrop has been found near this property. An effort will be made to determine whether or not the lode crosses the company's land.

Quincy.—At this mill the work of replacing the finishing jigs with Wilfley tables is progressing as rapidly as possible without interfering with the work of the 5 heads in the mill. To replace the 120 finishing jigs in the mill 12 Wilfleys will be necessary, each Wilfley table doing the work of 10 jigs. Six of the tables are now in place permanently and 2 temporarily while the corresponding jigs are being removed. The work of making the exchange will take some time and when it is completed Wilfleys may take the place of the old-style slime tables now in use at the Quincy.

Copper.—Keeweenaw County.

Mohawk Mining Company.—At this mine 115 men and 11 drills are now working. About 1,100 ft. south of No. 3 shaft a new shaft will be sunk soon. Following are the depths of the various shafts: No. 1, 473 ft.; No. 2, 529 ft., and No. 3, 287 ft. Following are the total driftings at the different shafts: No. 1, 1,355 ft.; No. 2, 1,316 ft., and No. 3, 447 ft.; total driftings, 3,118 ft.

Oneida.—At this property, formerly the Delaware, active mining will begin on the recently discovered amygdaloid lode. A small force of men is at work.

Iron.—Menominee Range.

Armenia.—This mine, near Crystal Falls, is having its surface plant put in order by Corrigan, McKinney & Company. No mining will be done before next year.

Latta.—This old property, north of Michigamme, about 6 miles from Mansfield, is being explored by Casper Aberle. It is stated that some high grade Bessemer ore has been found.

Voos.—This property at Crystal Falls is now controlled by Crerar, Clinch & Company, who own the Mansfield and the Columbia. The ore is a lean Bessemer and is stated to average 50% iron and 0.020% phosphorus.

MINNESOTA.

(From Our Special Correspondent.)

Receipts at the ore dock of the Duluth, Missabe & Northern road were about 40,000 gross tons, more than for any day in the history of the road.

Thirty-six ore cargoes of 5,000 tons or over cleared from the docks of the Duluth & Iron Range Road last week. For May the shipments from the port were about 600,000 tons, double the same period last year.

Cook County.

(From Our Special Correspondent.)

Paulson.—A crew of men is at work on this property and men are at work on the railroad to the mine, rebuilding bridge, ballasting and generally improving the road, which has been allowed to fall into ruin.

Iron.—Mesabe Range.

(From Our Special Correspondent.)

Parmalee & Co., who took options on several state leases a few weeks ago, have struck ore in several places. On one forty in 3, T 58, R 18, near the Mountain Iron, they have a good deposit. In 21, T 58, R 19 they have also struck ore. Their option calls for the payment of \$100,000 for the leases.

Mitchell lands, under option by Fay, et al., are to be explored at once. As there are some 2,000 acres in the tract scattered over the range, this will take some time.

Miller, Brown & Merritt.—Explorations for these parties on state lands in 11, T 58, R 18, have disclosed some 5,000,000 tons of fair bessemer ore. This land lies to the southwest of the Mountain Iron Mine.

Ohio Mining Company.—This company has begun shipments this week, with one shovel in ore. A stripping contractor has commenced work and will continue all season. The mine will be a steady shipper, and a new 85-ton Bucyrus shovel is to work there.

Union Ore Company.—This company will sink a 4 compartment shaft, 6 by 19 ft. inside timbers, on its new property in 9, 7 58, R 17. E. S. Parmalee is in charge. This will be one of the largest shafts in the district.

Iron Vermillion Range.

(From Our Special Correspondent.)

Chandler Iron Company.—This company is employing about 500 men and the monthly pay roll is about \$35,000. Wages are higher than ever known at this or any other mine of the Lake Superior region since modern conditions ruled, and was in April \$2.39 per day per man on the location. The mine is shipping about 35,000 tons a week. The company is spending for wages alone about \$5,000 a month in exploratory work on the 2 ranges, a large amount of which is close to Ely. The work under way on the Conan lands, southwest of Ely, has been discontinued for the present, but other explorations are being pushed rapidly.

Minnesota Iron Company.—This company has found ore in the S.E. ¼ of the N.E. ¼ of section 25, a mile from Ely, where it has 4 diamond drills working steadily, and the land is under lease at 25c. a ton. The lease includes the entire N.E. ¼ and the N. ½ of the S.E. ¼, and the adjoining 40 acres of the S.W. ¼; 280 acres in all.

Oliver Iron Mining Company.—This company has begun explorations again on the McDonald 40 of section 30, T 63, R 11, where it worked all last summer.

Pioneer Iron Company.—This company is employing 400 men and is shipping 20,000 tons weekly. The other mines of the Oliver Iron Mining Company at Ely are operating some 250 men and shipping 8,000 tons weekly. The company expects to explore the N.E. ¼ of section 26, adjoining its Savoy Mine, before long.

MISSOURI.

Jasper County.

(From Our Special Correspondent.)

Joplin Ore Market.—The price of fancy grade ore has been cut another dollar, and some choice lots at Oronogo, Carthage, Neck City and Joplin sold at \$30 per ton, but lower grades of zinc ore sold in some cases \$1 per ton higher than last week, and buyers bought more freely. Mat-

thiessen & Hegeler are still out of the market, and there is a rumor that the Illinois Zinc Company, at Peru, Ill., will close, which will still further disturb the market. Lead sold all the week at \$22.50 per 1,000 lbs. During the corresponding week last year fancy grade zinc ore sold at \$49.50 and lead had advanced to \$26 per 1,000 lbs. The lead sales were less than last week by 45,570 lbs., the zinc sales greater by 1,332,910 lbs., and the value greater by \$89,247. For the first 21 weeks last year the lead sales were less than this year by 4,784,820 lbs., the zinc sales greater by 10,284,540 lbs., and the value greater by \$950,042. As compared with the previous week, the lead sales were less by 80,690 lbs., the zinc sales greater by 698,200 lbs., and the value greater by \$20,824. Following is the turn-in by camps of the Joplin District for the week ending May 26th:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin.....	2,500,680	580,580	\$52,079
Galena-Empire.....	1,414,120	135,840	22,854
Cartersville.....	1,909,210	173,140	25,670
Oronogo.....	765,160	3,690	10,743
Webb City.....	464,740	49,560	7,055
Belleville.....	358,260	16,930	5,676
South Jackson.....	91,250	17,790	1,540
Aurora.....	1,170,000	20,380	12,733
Cave Springs.....	128,350	5,550	1,630
Duenweg.....	270,130	42,540	3,819
Stotts City.....	125,070	.....	1,751
Granby.....	268,000	11,000	3,300
Neck City.....	421,670	.....	6,325
Central City.....	155,600	2,010	1,980
Carthage.....	103,700	.....	1,088
Ash Grove.....	78,710	.....	551
Dade County.....	82,580	.....	578
District total....	10,309,230	1,059,580	\$163,374
Total 21 weeks ...	204,864,020	23,983,340	\$3,689,242

The producers who built mills in the district when ore was from \$50 to \$55 per ton are dissatisfied with the present price, and naturally all of the operators would like to see the price higher, but with the present condition of the metal market there seems little likelihood of an immediate advance. The producers' association is urging another shut-down, but the big companies are almost unanimously against the movement.

Mining Land Sales.—Rush & Paschal have sold the Wahoo Mine, on North Heights, to W. A. Schurman of Kansas City for \$20,000, and the mill will start in a few days. John D. Cameron has sold to F. & S. Bassett of Boston, Mass., the Tutt Mines and 4-acre lease at Midway, and another 80-acre lease, the consideration for both properties being \$15,000. The Hart, Chambers & Dewold 20-acre lease of the Bruce land at Zincite, locally known as Belleville, has been sold to John D. Cameron for \$8,000. Ayres, Hadley & Bennett, who owned the Cotton Tail Mine on the Granby land at Joplin, have sold the property to Chicago parties for \$2,500.

New Mining Companies.—The Indianapolis Lead and Zinc Company, capital \$50,000; incorporators, Jonathan Stewart, Col. John T. Figg and Charles F. Coffin of Indianapolis, and G. W. McVicker and Joseph V. Martin of Joplin. Prairie Lead and Zinc Company of Carthage, Mo., capital \$80,000; incorporators, H. D. Haight, Thos. C. Clark and C. Remington of Chicago, E. A. Hannum, Webb City, Mo., and P. E. Hannum of Carthage, Mo. Ash Grove Mining Company, capital stock \$115,000; incorporators, W. B. Hill, Alfred Toll, J. F. Pollock, all of Kansas City, and J. H. Barton, Ash Grove, Mo.

MONTANA.

Fergus County.

(From Our Special Correspondent.)

Maginnis.—This property at Maiden is under bond to A. S. Wright, who has had a force of men working for some time cleaning up the old property.

New Year Group.—A. S. Wright has disposed of his interests in this property as have also Johnson & Day, his partners in the Standard Exploration Company, which is comprised of several St. Paul men headed by Mr. Weyerhauser, of the German National Bank.

Flathead County.

Buzz Saw.—Larson & Greenough have taken over this property by purchase. W. A. Hillis, of Libby, has it in charge, and is advertising for contractors to bid on driving the tunnel 200 ft. further. Heavy machinery, it is said, has been ordered capable of sinking 1,000 ft.

Jefferson County.

The Montana Ore Purchasing Company of Butte has purchased several hundred acres of timber lands on McClellan Gulch and has men cutting sawlogs. A large saw mill is about ready to run.

Elkhorn Queen.—A proposition to bond this property at \$60,000 for 18 months has been submitted. A list of 1,000 tons was put through the Peck-Montana mill at East Helena with good results.

Euclid.—This property is owned by the Merchants' National Bank of Helena is about to be sold for the amount of the indebtedness to that institution.

Hartman.—Donnelly & Company, who owned and are working this property, have encountered

2 ft. of good shipping ore in the new shaft. The claim is 6 miles from Alhambra and is the west extension of the B. & G. property.

Overland.—Matt Alderson of Helena has taken a bond with the intention of erecting a cyanide mill.

Lewis & Clarke County.

(From Our Special Correspondent.)

War Eagle.—This mine near Butler, 12 miles west of Helena, is the scene of the present operations of the Iron Mountain Company. The property was acquired by the company under a bond to purchase and the work of sinking a shaft on the outcrop of the lead commenced in June, 1898. At the present about 4,000 ft. of development work has been done, most of it dead work. The main shaft is 400 ft. deep and is equipped with a hoisting plant of 100 H.P., handling a double deck cage. Steam is supplied by 5 boilers of 240 H.P. located in a detached building 300 ft. away from the shaft and headworks. A compressor furnishes power for the drills. Robert Angus is superintendent.

The ore so far developed is in a magnesium lime formation which lies on the granite, the sump and station at the 400 ft. level being in the granite. A crosscut south at a distance of about 200 ft. again encountered the lime and also an ore body, which is found to be 14 ft. wide. The ore is an iron oxide averaging 30% excess iron, and with small assay value in silver and gold. The company has a contract to furnish the smelter at East Helena with 100 tons per day and has furnished to date about 57,000 tons from and above the 300 ft. level. The average price received for this product f.o.b. at mine was \$3 per ton. The annual report of Mr. Angus states that the purchase price has been paid over, and development work is paid for, including the equipment, and the property is free of any debt.

Winscott.—The deal on this property which was being worked up in New York by C. E. Gable was not successful, so the bond has been turned back to the Winscott Brothers, the owners.

NEVADA.

Lincoln County.

(From Our Special Correspondent.)

Quartette Mining Company.—The company is making slow progress putting in its 20 stamp mills and cyaniding plant on the banks of the Colorado River about 12 miles east of Searchlight and 50 miles north of Needles, Cal. There is a difference of elevation between the mines and the river of about 3,000 ft. and a very sandy road. Part of the machinery is on the ground and the foundation is under construction. Two new hoisting plants will shortly be installed. One is a gasoline and the other a steam hoist. Contracts will soon be let for delivery of 60 tons of ore per day at the mill, which will hardly be ready before September.

Sandy.—A number of mines are working here, producing quite a tonnage of lead and copper ores, which are hauled by teams to Manvel, 30 to 40 miles. These ores are shipped to Pueblo, Colo, and El Paso, Texas. There is some talk of a smelter being built at or near Sandy.

Searchlight.—This mine is developing nicely and has now about 700 ft. of development work, and it has been estimated there are 10,000 tons of \$25 gold ore blocked out. This mine has been examined by the agent of a well-known mining man.

Storey County.—Comstock Lode.

Consolidated California and Virginia.—An official report shows that this company had crushed and treated at the Kinkead Mill in March 271 tons of ore, the concentrates and base bullion being shipped to the Selby Smelter. The yield was 184 oz. gold and 6,343 oz. silver. The gross returns in money value were \$7,342, or \$27.09 per ton. The total charges were \$1,282, leaving a net return of \$6,060, or \$22.36 per ton.

NEW HAMPSHIRE.

Mica.

(From an Occasional Correspondent.)

The mica business for 1899 has been confined to a few producers, only 3 mines being in operation, the Davis Mica Company of Alstead, the Ruggles Mine in Grafton, and the Hoskins Mines in Gibson and Alstead. All of the grinding and manufacturing has been done at the mills of Albert J. Hoskins at Gibson, now the only mills in New England. Their output is about 3 tons per day, for foreign and domestic trade. Most of it is used by the wall paper trade. The Hoskins mill has been running night and day for 8 months. Mr. Hoskins' mines also scrap at North Rumford, and supplies the mica mills in Munroe, N. Y., with all the scrap they use. The Davis Company of Alstead is increasing its capacity by putting in a new cable system for hauling waste rock. The Ruggles is doing about as last year. There have been a few prospects started in Grafton and Groton, with the usual failures.

SOUTH DAKOTA.

Custer County.

(From Our Special Correspondent.)

Crown Hill Mining Company.—This company has completed its 50-ton concentrating plant at the Spokane Mine, and a trial run will be made next week. Work has begun again in the shaft. Ore will be taken from the 100-ft. level. About 700 tons of galena ore are on the dump ready for treatment. S. E. Young of Spokane is general superintendent.

Florence.—A car-load of mica in the rough was shipped this week from this mine to Chicago by Charles Harback of Custer, superintendent of the mine for the Chicago Mica Company.

May.—The shaft on the vertical of free milling ore on the May property on Lightning Creek, is down 50 ft. The work is being done by local business men of Custer, who are putting up \$300 per month.

Lawrence County.

(From Our Special Correspondent.)

American Express.—This property, in Sheep-tail Gulch, a branch from Blacktail, has been idle several months. It is stated that Pittsburg, Pa., parties will build a cyanide plant. The owners of the ground, W. S. Elder, R. F. Jamison, of Deadwood, and others, will meet at Pittsburg this month to consummate the deal.

Anita Mining Company.—The directors of this company have arrived in Deadwood. They propose to push development on a group of claims west of Dumont.

Bear Gulch District.—N. M. Tomblin, of Chicago, has been investigating the Deadwood-Bear Gulch Company's ground in Bear Gulch District.

Detroit & Deadwood.—The boiler and engine belonging to this company are being taken from the City Creek copper property in Deadwood to the Annie Creek property. Work on the cyanide plant has begun.

Hardin.—Ore hauling to the smelter has stopped owing to the bad condition of the wagon roads. Ore is being stored at the mine.

Magnolia Company.—This company, recently organized, has commenced work on its group of claims in Burno Gulch.

Mineral Hill.—This mine has been leased to Messrs. Coyle and Secoy of Galena, and ore is being shipped to the Golden Reward smelter.

Spearfish Gold Mining Company.—This is the name of a new company which has purchased 365 acres of mining ground in the Ragged Top District. D. N. Heizer, Colorado Springs, organized the company.

Titanic Mining Company.—This company has purchased a 50-H.-P. boiler for sinking a shaft in Carbonate District. A hoisting plant is being erected.

Pennington County.

(From Our Special Correspondent.)

Cochran.—James Cochran, owner of a mine 3 miles west of Rockford, is to start his 30-ton Huntington pulverizer on free-milling ore.

Standby.—Work on the 1,400-ft. tunnel has been in progress since spring opened. The machinery is run by water power.

Uncle Sam.—The Clover Leaf Mining Company has the shaft down 340 ft. It is expected that ore will be mined in 3 months.

UTAH.

(From Our Special Correspondent.)

A Million Dollar Smeltery.—On May 25th Vice-President Barton Sewell, of the American Smelting and Refining Company, announced in Salt Lake City that the company intends to build the most complete modern smeltery in the world in Salt Lake Valley, for which purpose \$1,000,000 is to be expended. Several sites are being considered, and the selection will be made in a few days. Ground will be broken within a month and work rushed. Its initial capacity will be 25,000 tons of ore per month. The company's present plants, Germania, Mingo and Hanover, will be dismantled and abandoned. Mr. Sewell states that the advance in treatment charges on Utah ores was not warranted, and producers are promised a gradual reduction. Liberal concessions will be made to large shippers for 3 and 5 year contracts, and small mines are assured just treatment. All posted mining men look on this announcement with suspicion. As there are 2 well-matured projects for an independent custom smeltery, this move may be to discourage such an undertaking. Those in position to know state that a complete modern smeltery will cost several hundred thousand dollars less than \$1,000,000. However, some think that ore treatment rates will never be reduced to an equitable basis, save by the American Smelting and Refining Company's building a modern plant.

Bullion and Ore Shipments.—During the week ending May 26 there were sent forward from the different smelteries 19 cars, or 798,475 lbs., lead-silver bullion; 4 cars, or 214,860 lbs., copper bullion. In the same week there were shipped from different camps for treatment in smelteries

outside of the State 74 cars, or 2,522,500 lbs., of gold, silver and lead ores and 2 cars, or 110,600 lbs., copper ore.

Cyanide Products.—Consignments of products for cyaniding mills marketed at the Salt Lake office of the Consolidated Kansas City Smelting and Refining Company for the week of May 20th was 1,750 lbs., or about \$30,000. This was contributed by the Mercur, Sacramento, Chloride Point and the Lucky Boy—the last of Idaho.

Juab County.

United States Mining Company.—At the meeting in Boston on May 29th Robert D. Evans was re-elected president and F. W. Batchelder, secretary and treasurer. Manager A. F. Holden was chosen a director to succeed H. C. Thatcher, deceased. The report of the Messrs. Deveraux was before the meeting, but owing to the illness of President Evans it was decided not to make the report public. It was officially stated, however, that the report is very favorable. The directors authorized Messrs. Holden and Evans to secure plans for the election of a smelter. The directors have made a call for 10%, the third call, on subscribers to the bonds, payable June 1st.

(From Our Special Correspondent.)

Tintic Shipments.—In the week ending May 26th there were forwarded from the 3 railroad points of the district 1 bar of bullion, 102 cars of ore and 3 cars of concentrates, contributed as follows: Centennial-Eureka, 37 cars; Bullion-Beck, 10 cars ore, 1-car concentrates; Gemini, 10 cars ore; Godiva, 9 cars; Uncle Sam and Humbug, 9 cars each; Mammoth, 8 cars ore, 2 cars concentrates; Swansea, 7 cars; South Swansea, 6 cars; May Day, 3 cars; Boss Tweed, Joe Bowlers and Showers each 1 car.

Sioux-Utah.—On May 24th, by order of General Manager Robert D. Grant, both mines were closed down. Exploration under the new régime has been somewhat discouraging, but this sudden move is unexpected.

Star Consolidated.—A valuable gold find is the best mining news the camp has had for some time. It is sylvanite, and the first samples returned from \$45 to \$725 per ton. The find is on 200 level in new territory, and has been drifting on 45 ft., filling the entire face without showing any sign of diminishing. Superintendent Packard is receiving congratulations.

Summit County.

(From Our Special Correspondent.)

Park City Shipments.—For the week of May 26th total smelter products sent from the camp were 2,943,330 lbs., which was made up as follows: Silver King, crude, 1,052,680 lbs.; concentrates, 360,460 lbs.; Daly-West, crude, 834,250 lbs.; Ontario, crude, 296,890 lbs.; Anchor, concentrates, 208,350 lbs.; Apex, concentrates, 138,350 lbs.; Loring Brothers, concentrates, 52,350 lbs.

Crown Point-Ontario.—This law suit is scheduled to come up in the United States Court at Salt Lake on June 5th. It involves the alleged extra lateral rights of the Crown Point, and plaintiff avers damages of \$2,000,000.

Tooele County.

(From Our Special Correspondent.)

Daisy.—It is given out that the first tests on the ore made at the Butters laboratory afford hopeful results.

Geyser-Marion.—Superintendent Butler is demonstrating that this ground is not exhausted of profit-paying ore. Below all the old workings a strong ore seam is cut which promises to prove extensive. Since the first of the year the company has fallen \$2,500 behind expenses, and prior thereto there was a debt of \$5,000. The 3c. assessment just levied, delinquent June 27th, and date of sale July 30th, will furnish \$9,000. With all debts wiped out the management believes the mines will again earn considerable more than current expenses.

Piute County.

(From Our Special Correspondent.)

Huck Placer.—A sensation was caused early in the week by the location—some call it jumping—of the ground of the Snyder Improvement Company's holdings by 8 placer claims of 20 acres each, in a group, as the Huck Placer, and transferring the same to the Jessie Welmer company, of which John B. Welmer is agent. This ground was bought in April last by the Kimberley-Huck syndicate for \$100,000, of which John B. Welmer received some \$15,000. He now alleges that the original Snyder lode locations are not valid, as the territory is placer ground, and further that the assessment work was not done.

WEST VIRGINIA.

Fayette County.

Raven Coal and Coke Company.—This company has begun shipping coal from its mine on Blake's Branch.

Kanawha County.

(From Our Special Correspondent.)

Cannelton Coal Company.—This company at Cannelton is putting in a Jeffrey electric plant for mining and haulage.

FOREIGN MINING NEWS.

ASIA.
Japan.

According to information received by the "Japan Weekly Mail," it really seems as though the discovery of placer gold in Hokkaido were likely to prove an event of great importance. By latest accounts no less than four large districts are auriferous—Oshima, Hitaka, Ishikari and Toshiwo. The Japanese evidently believe in the prospects of the place. It was discovered in the year 1898, and the following year saw about 7,000 persons at work, whereas 40,000 are expected to participate this season. The best results thus recorded have been on the Usatan and Pechang branches of the Tambetsu River and on the Panke and Toimski branches of the Horobetsu River. Nuggets weighing ½ oz. have been found, but such chances are rare. The discovery of this auriferous district may be of very great value to Japan. It is said that at present the methods of working are often very defective. Common laborers without any experience whatever are digging, the result being that they not only fail to extract more than a fraction of the gold available, but also render large areas unsuitable for subsequent exploitation. A company has been formed by some foreigners in Yokohama, who are said to have acquired 37 acres for 7,000 yen. An expert has been engaged from California, and all the necessary arrangements have been completed for commencing operations. As to the gold actually recovered last year, the estimates vary from 21,000 to 30,000 oz.

AUSTRALASIA.
New South Wales.

The gold production for March is reported as 25,377 oz., which compares with 37,487 oz. last year, a decrease of 12,110 oz. For the three months ending March 31st the total was 85,233 oz., against 100,153 oz. in 1899; a decrease of 14,870 oz., or 14.8%, this year.

New Zealand.

(From Our Special Correspondent.)

The March return of the Progress Mines, Reefton, is £7,820 (\$39,100), from 4,875 tons. The yield of the Hauraki gold field is slightly reduced, owing to dry weather lessening the water supply, and compelling some batteries to hang up stamps. The chief returns are: Waihi, £20,198 (\$100,990), from 7,570 tons; Waitekauri, £6,109 (\$30,545), from 2,054 tons; W. Z. Crown, £5,330 (\$26,650), from 2,965 tons; Talisman, £2,931 (\$14,655), from 884 tons; Kawie Freeholds, £2,395 (\$11,975), from 1,978 tons; Hauraki, £1,413 (\$7,065), from 150 tons; Whangamata Corporation, £1,400 (\$7,000), from 795 tons; May Queen, £1,379 (\$6,895), from 533 tons; Tararu Creek, £1,217 (\$6,085), from 980 tons.

The total return of the Hauraki gold field for the month is £46,841 (\$234,205). The chief event in March was the starting of the Waihi Grand Junction Company's new Cornish pump, a 16-in. one, with 10-ft. stroke, and a capacity of 40,000 gals. per hour.

The Waihi Extended Company, whose claim adjoins the Waihi Company's and the Grand Junction Company's claims, has struck quartz in 2 boreholes. After going through nearly 200 ft. of a pumaceous rhyolite, the holes reached andesite, and at about 300 ft. struck quartz. As the drill has a chisel bit no cores can be obtained, and the nature of the quartz deposit remains somewhat uncertain. The manager hopes he has struck a continuation of one of the Waihi Company's valuable reefs.

Queensland.

The Mines Department reports the gold production for March and the three months ending March 31st as below, in crude ounces:

	1899.	1900.	Increase.
March	86,375	91,304	4,929
Three months.....	205,542	226,112	20,570

Of the March output 89,267 oz. came from the quartz mines, and only 2,037 oz. from alluvial or placer workings.

Tasmania.

The Mines Department reports the metals and minerals exported from Tasmania in March as follows: Gold, 1,830 oz.; silver-lead bullion, 55 tons; tin, 154 tons; blister copper, 959 tons; gold pyrites, 33 tons; silver ore, 1,094 tons; copper ore, 6 tons; wolfram ore, 23 tons; iron ore, 390 tons. The total value was £134,031, which compares with £108,847 last year, showing an increase of £25,184.

Victoria.

The production of gold in March is reported at 71,122 oz., against 74,213 oz. last year, a decrease of 3,091 oz. For the three months ending March 31st the total was 173,313 oz., which compares with 184,908 oz. in 1899, showing a decrease of 11,595 oz., or 6%, this year.

Western Australia—Kalgoorlie District.
(From Our Special Correspondent.)

Great Boulder.—This mine has 12 Edwards furnaces erected, the estimated capacity of each furnace being 150 tons per week. These furnaces have been for many years at work in

Ballarat, Tasmania, etc. They require but little fuel and insure a sweet roast, built on the principle of a vanner, the hearth on which the mechanical rabble works may be elevated or lowered by screws, according to the amount of sulphur present. This is the deepest mine here; one shaft has been sunk 1,000 ft. and the vein tested to 1,100 ft. by diamond drill, the core showing telluride and free gold. The vein has not been opened below the 600-ft. level. Cross-cuts are now extended at the 900 and 1,000-ft. levels.

Hannan's Star.—This mine has adopted the "Diehl Process," consisting of wet crushing, concentration and bromo-cyanide solutions. There have been repeated stoppages, not all due to the plant, which is now running on oxidized ore, but it is hoped to treat sulphide soon. The process is watched with great interest.

Kalgurli.—The plant has begun work but with what result is not yet made known. It is reported that the design of the plant is good, but that the material and workmanship is not of high excellence. The mine underground has evidently a bright future.

South Kalgurli.—This mine claims reserves of 120,000 tons above the 500-ft. level, and it is proposed to first treat the oxidized ores by crushing in Griffin mills. The plant should soon be at work. The cooling floor, after the roasting of the sulphide ores, is 120 ft. long by 8 ft. wide; big enough for a success.

CANADA.

British Columbia—West Kootenay District.
(From Our Special Correspondent.)

London & British Columbia Gold-Fields.—This company recently declared a second dividend at the rate of 15%. This company, in addition to possessing large franchises in water and light power, owns the Yoner mines, White Water and Ruth mines in British Columbia, and the Norfolk, Alma and New York groups in the Yukon.

British Columbia—Yale District.

(From Our Special Correspondent.)

Lucky Strike Group.—The management, under the superintendence of James Argall, has unwatered the shaft, which is being deepened. This property is owned by the British Columbia Exploration Syndicate, of London, Eng., with John Cobbleddish manager. In 1897 a shaft was sunk 75 ft. on a cropping of high grade chalcopryite, which faulted at 28 ft. The mine closed pending negotiations for adjacent territory, which resulted in the purchase of 4 surrounding claims for \$25,000, the first payment being made 30 days ago.

Python.—Eight men are at work on this Kamloops property. A double compartment shaft is down 125 ft., and on vein matter occasionally intersected by stringers and bunches of high grade ore. At 56 ft. a drift has been run west for 96 ft. on the lead, showing pay ore, 20 tons of which have been shipped to the Trail Smelter. A drift 75 ft. from the shaft cuts through a concentrating ore of pay value. The lead in some places is 44 ft. wide. Hoisting is by a 1-horse whim, and a shaft house has been erected.

Nova Scotia—Guysboro County.

(From Our Special Correspondent.)

Blue Nose.—This mine, at Goldenville, continues its steady average yield of 400 oz. per month.

Richardson.—This mine, in Honnont District, continues to increase its yield, last month's return from 2,000 tons of ore being \$12,000, the net profit from which was over \$8,000.

Union Development Company.—This company has stopped work for the present owing, it is said, to internal troubles. There was left considerable indebtedness, which is being now paid off. This company controls a valuable property waiting development.

Nova Scotia—Halifax County.

(From Our Special Correspondent.)

The 50-stamp mill on the Gay's River conglomerate deposit has been pushed in a vigorous manner; 30 stamps are now dropping, and the remaining 20 will be in commission in a few days. The results of working this mineral deposit of conglomerate are looked to with great interest. Engineer McNulty has no doubt about satisfactory results, claiming the ore to be like that of the Rand.

Tunnel.—The 50-stamp mill at this mine, in Waverly District, is nearing completion. The power is brought from Fall River, a distance of 1½ miles, in an open sluice. Every modern appliance will be in use. The 2 mines, though but 20 miles apart, are in entirely different formations, the one in conglomerate, with pebbles of slate, quartz, granite, sandstone, etc., with sulphurets in the cement, the other in well-defined hard quartz veins between bands of slate. The gold in the conglomerate is fine, thin, flaky; that in the quartz veins is coarse and heavy, nuggets some ounces in weight often being found. These properties both belong to the same company and are under one management.

Ontario—Rat Portage District.

(From Our Special Correspondent.)

Champlon (Old Bad Mine).—Shipping to the

reduction works at Keewatin is to begin shortly. The surface improvements are completed and mining is going on. A drift will be started between 140 and 150 ft. This property is owned by the Champion Mining Company, an offshoot of the Bullion Mining Company.

Mikado.—The first dividend, amounting to 5%, has been declared. The directors' report shows No. 1 vein opened to 300 ft., showing a large body of good ore. No. 1 is the only vein now worked. On No. 3 vein the shaft is down 190 ft., with drifting at the bottom. Since starting the mill 27,378 tons of ore have been crushed, yielding 14,334 oz. gold, while the cyanide plant has handled 94,577 tons of tailings, recovering therefrom 2,445 oz. of bullion. The result of the April clean up was \$18,000 worth of gold. The mill has 20 stamps; 70 men are employed. A number of new mining claims have been surveyed this spring, and some good finds are reported.

Sirdar.—This mine, on Shoal Lake, and the Lizzie Mine of the Virginia Mining Company, at the northeast end of Sturgeon Lake, have been closed down. What the trouble is is not yet made public.

COAL TRADE REVIEW.

New York.
Anthracite.

June 1.

The hard coal trade shows no activity worth particular mention. The movement of coal up the Lakes is not heavy, and the demand from points east of Cape Cod shows no new development. This is, indeed, the dull season and there is small chance of any increase in demand before July at the earliest. In Chicago territory trade is pretty quiet, though there is reported to be a little more life to the market. At the head of the lakes there is but little doing. At Buffalo and at all Eastern seaboard points trade is dull. The large companies remain pretty firm on prices and seem well together in holding down the output to market needs. There are the usual concessions, "made by independent operators," but there is nothing to show that there is likely to be later on a repetition of the tendency to sacrifice prices for a big tonnage showing that prevailed in 1898 and many a previous year.

We quote free-burning white ash, f. o. b. New York harbor, as follows: Broken, \$3@3.20; egg, \$3.25@3.50; stove, \$3.45@3.70; nut, \$3.45@3.70; pea, \$2.40@2.60; buckwheat, \$2@2.20. The steam sizes are affected by the lower prices for bituminous and are easier to get, in spite of their limited supply owing to the restrictions on production.

Notes of the Week.

The Philadelphia & Reading Coal and Iron Company makes the following statement for April and the 10 months of its fiscal year from July 1st to April 30th:

	April.	Year.
Earnings.....	\$1,459,098	\$23,757,090
Expenses.....	1,497,884	21,996,452

Net or Deficit..... D. \$38,786 N. \$1,759,638
For the 10 months there was an increase of \$3,797,135, or 19.0%, in earnings; an increase of \$2,999,479, or 15.8%, in expenses; and an increase of \$797,656, or 82.9%, in net earnings.

The Lehigh Valley Coal Company reports for April and the 5 months of its fiscal year from December 1st to April 30th as below:

	April.	Year.
Earnings.....	\$1,075,929	\$7,052,462
Expenses.....	1,207,345	7,388,336

Deficit..... \$131,416 \$375,92
For the five months the earnings decreased \$50,704, or 0.7%, and the expenses \$15,347, or 0.2%; leaving an increase of \$35,357, or 11.7%, in the deficit.

Bituminous.

Generally speaking, trade in the seaboard bituminous trade is slightly better, there being a trifle stronger demand for coal. Still, there is plenty of coal at all the tidewater ports and railroads have begun refusing further shipments to certain consumers till they move coal already standing in cars at tidewater. Some stocking up is going on.

Export trade is developing into more of a reality. Inquiries from outside parties are ceasing and shipments to foreign parts are becoming more regular. All the principal European governments have been trying to secure coal on this side, but as yet we have little definite knowledge of any very large contracts for future delivery. Still, quotations of freights are heard of, and though foreign trade is but a small affair as yet, it is full of promise. The Pennsylvania Railroad's big new docks at New York harbor are evidently to be designed to supply some of this trade when it comes.

In the far East some large railroads are not contracting for the full amounts they will need. The New Haven has turned down its bids and is going to pursue a waiting policy, relying on outstanding contracts and hand-to-mouth buying to keep supplied. There is plenty of coal at

points beyond Cape Cod and speculative shippers have fared ill; we hear of sales at \$2.15 alongside at Boston. Along the Sound coal is in good supply and also at New York harbor. All rail trade shows a fair tonnage at fairly good prices.

The George's Creek strike is liable to end suddenly. At a recent mass meeting attended by the miners from several mines it was voted to ask the labor organizers to call the strike off. The men have been losing good wages, while the companies still have the coal to mine and have simply lost an extra profit.

Transportation from mines to tide is good. Car supply is limited by the handling of coal at tidewater by individual shippers. In the coastwise vessel market vessels above 1,000 tons are in good supply, and we quote the following rates from Philadelphia: Providence, New Bedford and the Sound, 70¢@75¢; Boston, Salem and Portland, 80¢; Portsmouth, 85¢. Ocean freight rates for small vessels cannot be given; they are determined by negotiation with the owner or captain.

We quote Clearfield coal at \$2.50@2.75, f. o. b. New York harbor ports, and \$2.15@2.40, f. o. b. Philadelphia. Cumberland, \$2.25@2.50 f. o. b. Baltimore.

Birmingham, Ala. May 28.
(From Our Special Correspondent.)

All mines in Alabama are working full time and indications are that all the coal that can be mined through this year will find a ready sale. There seems trouble brewing, however, with labor, and it would not be surprising to see a general strike. Petty difficulties at small mines are now heard of, and it is possible that the scale convention, commencing on June 20th, may result in a strike being ordered. Several of the smaller companies are recognizing the Knights of Labor, which has some following among coal diggers, though nothing to compare with that of the United Mine Workers of America. The latter organization demands that its locals be recognized.

The Republic Iron and Steel Company is preparing to build a washer at its Sayreton mines capable of washing 1,200 tons of coal per day. The Alabama Consolidated Coal and Iron Company has built a new washer at Brookwood and is at work on a second one at Searles. The New Castle Coal, Iron and Railway Company is building a washer at New Castle. The Sloss-Sheffield Steel and Iron Company is building a 400-ton washer at Brookside and is preparing to build a larger one at New Found, near Brookside. The demand for coke is still very urgent and the various mining companies are making preparations for a big supply.

Contracts are being let for the construction of the Ensley Southern Railroad, from Ensley to Parrish, a distance of about 35 miles, which will be completed by the end of the year. It will pass through a very rich coal-field. The Louisville & Nashville Railroad is also preparing to build its coal extension from Phelans, on the main line north of Birmingham, to Ensley, passing through rich coal lands in Blount, Walker and Jefferson counties.

Chicago. May 29.
(From Our Special Correspondent.)

Anthracite Coal.—The buying of anthracite coal is somewhat better than last week. Business conditions in Chicago and throughout the West were never better, and it seems that the consumption of anthracite coal ought to be much larger. Prices appear to be strictly maintained, the circular being \$5 for grate and \$5.25 for egg, stove and chestnut.

Bituminous coal appears to be in greater supply than demand, and shippers are apparently oblivious of that fact. The amount of coal in and about the city at the present time is enough for a month's heavy demand. Prices are weakening under the burden. Manufacturing concerns and railroads contract to take large quantities of coal, and manage to buy at material reductions from circular prices. Some soft coal prices are: Brazil block, \$2.50; Hocking Valley, \$2.75@3; Pocahontas, \$3.50@3.75; Raymond, \$3.15.

Coke is now in better supply than demand, the first time in almost a year. Prices have sagged. Some quotations are: Pocahontas, \$5.65; Fairmont, \$5.25; Connellsville, \$6.25.

Cleveland, O. May 29.
(From Our Special Correspondent.)

The last week has seen a very decided improvement in the amount of coal shipped to the lakes for transportation to points in the Northwest. The increase at the Ohio ports was very perceptible. Shippers who had been unable to fill any but contract tonnage found that they had coal enough on hand to go into the market for wild boats. This made the best demand for coal tonnage that has been seen this year. There is still a lack of dock space at all Ohio ports. While the coal has been coming in very liberal quantities the boats have not all been able to load as fast as the owners would like, because of the rush of boats to the docks. The shipment of coal is a greater factor in the market this year than it has been for a num-

ber of seasons past. It has been found that dock space that was adequate while the shippers were begging for tonnage, is not adequate when the owners are seeking for cargoes, which latter condition prevails this year. With plenty of coal the rates for transportation have an upward tendency. The market is very strong, but no change has been seen as yet, Duluth bringing 50c., Milwaukee 65c., and Chicago 70c., with all other ports scaled on those prices. The only weak point in the market during the week was Buffalo, which showed a slight fall on Saturday, but this did not affect the Ohio ports.

Shanghai, China. April 19.
(Special Report of Wheelock & Co.)

Coal.—Very quiet. Arrivals for the fortnight were 9,651 tons. We quote, per ton, as follows: Welsh Cardiff, 20.50 taels; Australian Wollongong, cargo, 13 taels and other sorts, 6.50@7 taels; Chinese, Kaiping, lump, 7.50@8.50 taels; dust, 5 taels, and mixed, 5.50@6 taels; Japan, all contracted for.

Kerosene Oil.—Small business done. Arrivals, large, and market weak. For the fortnight arrivals were: 187,000 cases American, 283,000 cases Russian, and 30,000 cases Sumatra. Stocks, including these arrivals, are estimated at 810,000 cases American; 814,300 cases Russian, and 94,000 cases Sumatra; total, 1,718,300 cases. We quote, per case, as follows: American, Devoo's, 2.22 taels; Russian, Batum Anchor Chop, 2.10 taels; Star & Crescent Chop, 2.05 taels; Ram Chop, 2.06 taels; Horse Chop, 2.07 taels; bulk oil, loose, 1.57½ taels; Sumatra, Langkat, loose, 1.57½ taels.

SLATE TRADE REVIEW.

New York. June 1.

The list of prices per square for No. 1 slate standard brand f. o. b. at quarries in car-load lots, is given below:

Size, inches	Monson or Br. v. ville.	Bangor.	Bangor Ribbon.	Alb'n. or Jackson Bangor.	Lehigh.	Peach Bottom.	Sea Gr'n.	Unfaded Green.	Red.
24 x 14	6.10	3.50	3.00	3.25	3.10	5.10	3.15	3.75	.....
24 x 12	6.00	3.50	3.00	3.25	3.10	5.25	3.15	3.75	.....
22 x 12	6.00	3.50	3.25	3.50	3.25	5.25	3.15	3.75	.....
22 x 11	6.50	3.75	3.25	3.50	3.25	5.25	3.15	4.00	.....
20 x 12	6.90	3.75	.....	3.50	3.25	5.25	3.15	3.75	.....
20 x 11	6.80	.....	.....	3.75	3.50	5.25	3.15	.....	.....
20 x 10	6.80	4.25	3.50	3.75	3.50	5.35	3.15	4.25	10.50
18 x 12	6.80	3.75	.....	3.50	3.25	5.25	3.15	3.50	.....
18 x 11	7.00	.....	.....	.....	.....	.....	3.15	3.75	.....
18 x 10	7.20	4.25	3.50	3.75	3.50	5.35	3.15	4.00	10.50
18 x 9	7.10	4.50	3.50	3.75	3.50	5.35	3.15	4.25	10.50
16 x 12	6.80	3.75	.....	3.50	3.25	.....	2.95	3.50	.....
16 x 10	7.10	4.25	3.50	3.75	3.50	5.25	2.95	4.00	10.50
16 x 9	7.09	4.25	.....	3.75	3.50	5.35	2.95	4.25	10.50
16 x 8	7.20	4.50	3.50	3.75	3.50	5.35	2.95	4.25	10.50
14 x 10	6.90	3.75	3.25	3.25	3.25	5.25	2.85	3.75	10.50
14 x 9	6.50	.....	.....	.....	.....	.....	2.85	3.75	10.50
14 x 8	6.60	3.75	3.25	3.25	3.10	5.10	2.85	4.25	10.50
14 x 7	6.40	3.75	3.25	3.25	3.10	5.10	2.60	4.25	10.50
12 x 10	5.80	.....	.....	.....	.....	.....	2.60	3.25	.....
12 x 9	5.60	.....	.....	.....	.....	.....	2.60	3.25	.....
12 x 8	5.50	3.50	.....	3.00	2.80	4.85	2.60	3.50	9.00
12 x 7	5.00	3.25	.....	3.00	2.80	4.85	2.50	3.50	9.00
12 x 6	4.80	3.25	.....	3.00	2.80	4.75	2.50	3.50	9.00

A square of slate is 100 sq. ft. as laid on the roof.

Production is less than last year. Orders for home consumption have been tied up by the labor difficulties in the building trades, while on export account one of the largest shippers says his bookings have fallen off fully 40% since 1899.

In the Lehigh region stocks are large, while in Vermont there is a shortage of the large sizes of roofing slate.

Some new price-lists have been issued lately showing a cut of 25c. per square on No. 1 Bangor roofing slate, sizes 18x10 and 20x10 in., and Lehigh, 16x12 in., while New York red slate is 50c. per square lower all round.

The movement of slate from Slatington and Walnutport, Pa., in the week ending May 24th was as follows: Roofing, 5,364 squares; school, 33 cases, and blackboards, 155 crates. As compared with the week of May 17th there is an increase of 873 squares roofing slate, and a decrease of 135 cases school slates and 61 crates blackboards.

The exports of slate from the United States in the four months ending April 30th are compiled by us as below:

	Roofing.		Mfrs. Value.
	Squares.	Value.	
January.....	14,151	\$72,103	\$4,489
February.....	12,062	60,312	6,701
March.....	6,249	31,245	10,978
April.....	6,368	32,447	19,887
Total.....	38,830	\$196,107	\$42,055
Total, 1899.....	86,419	386,618	48,058

The value of exports this year amounts to \$238,162, as against \$434,676 in the corresponding four months of 1899, showing a decrease of \$196,514, or 45%. The total quantity of roofing slate shipped so far is 47,589 squares less than 1899. This falling off is due chiefly to the lesser imports by the United Kingdom.

IRON MARKET REVIEW.

NEW YORK, June 1, 1900.

Pig Iron Production and Furnaces in Blast.

Fuel used	Week ending				From Jan., '99.	From Jan., '00.
	June 2, 1899.	June 1, 1900.	June 2, 1899.	June 1, 1900.	Tons.	Tons.
An'racite & Coke.	197	246,379	266	288,525	5,158,362	6,245,609
Charcoal.	20	4,925	24	6,250	108,423	156,048
Totals..	217	251,275	290	294,775	5,266,785	6,401,657

The market is still a waiting one, but there is still a better feeling in evidence. That a lower range of prices is being established is generally admitted, but it is also felt that a very large volume of business is ready to be placed as soon as the settling of values is over. Besides this, a heavy export business is surer.

The calamity-howling "organs" have evidently had a hint from their owners, and have moderated their tone wonderfully.

The Amalgamated Association rates for the next year are now under discussion in committee, and there will probably be some time spent in arranging them, as the Association will ask for considerable increases in wages.

Notes of the Week.

Imports of iron ore into the United States in April were 21,726 tons only, against 42,482 tons last year. For the 10 months of the fiscal year from July 1st to April 30th the imports were 759,169 tons, which compares with 187,127 tons in 1899, and 340,429 tons in 1898.

Exports of iron and steel, including machinery, from the United States are valued as below in April and the 10 months of the fiscal year ending with April, by the Bureau of Statistics, Treasury Department:

	1899.	1900.
April.....	\$9,060,173	\$11,100,039
Ten months.....	76,272,778	98,012,194

The April exports included 11,064 tons pig iron (16,532 tons, 1899); 28,887 tons steel rails (27,762 tons, 1899); 5,240,126 lbs. sheets and plates (16,396,123 lbs., 1899); 17,900,273 lbs. wire (22,409,718 lbs., 1899); 4,155,067 lbs. bar iron and steel (10,391,504 lbs., 1899).

Birmingham, Ala. May 28.
(From Our Special Correspondent.)

It is learned that offers have been made for no less than 200,000 tons of Alabama iron for export purposes, delivery not desired all this year. The export trade, it is believed, will force the domestic purchasers who have been withholding, expecting the quotations to become easier, and who are still remaining off the market except in small lots, to again enter the arena and buy extensively.

There has been quite an amount of iron used in the local market lately, all plants being in full operation. In the Anniston, Ala., district one or two plants of some magnitude—the pipe plant, for one—have closed down, but in the immediate Birmingham District no plant has been disturbed. There is a little spurt on in finished iron affairs, and some of the product of the rolling mills has been exported recently—shipped to Mexico. The pipe plant at Bessemer has been shipping some of its product into Mexico also. The Dimmock pipe plant at North Birmingham will probably be ready to go into operation towards the middle of next month.

The following are the figures given as to pig iron: No. 1 Foundry, \$17.75@18.50; No. 2 Foundry, \$17@17.50; No. 3 Foundry, \$16@16.75; No. 4 Foundry, \$15.25@15.25; Gray Forge, \$15@15.25; No. 1 Soft, \$17.75@18.50; No. 2 Soft, \$17@17.50.

The Cole furnace, belonging to the Tennessee Company, at Sheffield, went into blast recently, and preparations are now being made to blow in the Hattie Ensley furnace, belonging to the Sloss-Sheffield Steel and Iron Company, at the same place.

Buffalo. May 30.

(Special Report of Rogers, Brown & Co.)

The foundry iron market looks a little brighter in this territory this week. It has been reported that two more furnaces that have been shipping into this district have stopped on account of the reduction in price, and the probabilities are a few others will soon be compelled to go out of blast permanently. While this has not as yet resulted in a material increase in buying, yet several of the larger consumers are watching the market with unusual interest, and evidently feeling if this continues it will very soon have the tendency to at least enable them to place orders further ahead, with more safety. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$21.50; No. 2, \$21; Ohio strong softener No. 1, \$22; No. 2, \$21.50; Southern soft No. 1, \$22.50; No. 2, \$21.50; Lake Superior charcoal, \$25; coke malleable, \$22.

Chicago. May 29.

(From Our Special Correspondent.)

Pig Iron.—Business in pig iron continues only in a moderate way, small quantities for quick

delivery being the rule. Prices are as follows: Lake Superior charcoal, \$24.50@25.50; local coke foundry No. 1, \$23@23.50; No. 2, \$22.50@23; No. 3, \$22@22.50; local Scotch No. 1, \$23@23.50; Ohio strong softeners No. 1, \$24@24.50 Southern silvery, according to silicon, \$25.50@27; Southern coke No. 1, \$22.35@22.85; No. 2, \$21.35@22.85; No. 3, \$20.35@20.85; No. 1 soft, \$22.35@22.85; No. 2 soft, \$21.35@22.35; malleable Bessemer, \$23@24; coke Bessemer, \$24@25.

Cleveland, O. May 29, (From Our Special Correspondent.)

Iron Ore.—The conditions surrounding the movement of ore down the lakes are very unsatisfactory to both the shippers and the vessel owners. The amount being moved from the mines to the lake ports is not equal to the demands of the contract tonnage, hence it is not uncommon for vessels to be delayed considerably before getting a cargo. The shipments are also limited because there seems to be no crying demand for it at the lower lake ports. The amount of ore that may be brought down the lakes this year is problematical. Charters were made last fall with an eye to the movement of about 20,000,000 tons, as contracts covered 18,500,000. Some of the contract boats, however, had conditions attached to their charters which allow the shipper to abrogate the contract if it shall be found that there is not that much ore to carry. Some boats, therefore, may be turned into the general market before the end of the season. The carrying rates now are nominally \$1 from the head of the lakes and 70c. from Escanaba. Little or no business is being done at Marquette, hence no rate is quoted.

Pig Iron.—The sales have been confined to car-load lots, and even these are limited. In a few instances the buyers are asking that their shipments be withheld, but for the most part the product of the furnaces is being taken up about as fast as it is turned out. Prices remain nominally at \$22.50 for No. 1 foundry and \$21@21.50 for No. 2, but no sales are being made on that basis. Bessemer is still quoted at \$24.90, but there is talk of shading it, as soon as any sale is made.

Finished Materials.—The weakest part of the market appears to be plates, no demand existing for them. The mills have not thought to coax business by shading the prices further, hence they stand at 1.60c., with a few parties quoting 1.65c. The combination price on structural iron remains unchanged, this being the strongest part of the market. On angles, of the smaller sizes, some shading of prices has been done. Angles less than 3 in. are being quoted at 2.10, while the larger sizes remain at 2.25c.

Philadelphia, May 30, (From Our Special Correspondent.)

The pig iron market is weaker and duller, despite the efforts that were made to make sales. The position taken by buyers here is that Bessemer must come down, and that when it does foundry and forge will decline in sympathy. Buyers have shown their indifference to all concessions made, but they admit that stocks are low among users. The summer suspension is likely to weaken the market a little more. Quotations are: No. 1 foundry, \$22.25@22.50; No. 2 plain, \$19.50@20; forge, \$17.50@18; Bessemer, nominal.

Billets.—There have been rumors for two or three weeks of a drop. The fact that sales have been privately made below open quotations would appear to point to an open concession.

Finished Material.—The entire market is weaker. The mills are less rushed. Buyers refuse to buy except in a hand-to-mouth way. Manufacturers say there is no business to be had through concessions. Some large consumers say a proper reduction will draw out big orders. Plans for the summer are not yet laid. It is known that big requirements exist, but there will be no haste to cover. A rumor prevails that steel rails are about to be reduced. Manufacturers of iron and steel specialties say they have all booked good orders within a week. Good orders are coming along from exporting sources. Large locomotive orders have been booked. Big bridge iron orders are looked for in June.

New York, June 1.

The local iron market is still unsettled, with buying little livelier than it has been for several weeks. The outlook for foreign trade is better.

Pig Iron.—There is something heard of business extending into the third quarter, but buying continues to be influenced largely by immediate needs. We quote for tidewater delivery: No. 1 X foundry, \$21.50@22; No. 2, \$20.50@21; No. 2 plain, \$18.50@19; Southern brands, New York delivery: No. 1 foundry, \$22.25@22.75; No. 2 foundry, \$21@21.50; No. 1 soft, \$22.50@22.75; No. 2 soft, \$21@21.50.

Bar Iron.—Prices have weakened. Common bars are now quoted 1.65@1.75c. for large lots on dock; refined bars, 1.80@1.90c.

Plates.—The market still shows little strength and prices are no better. We quote for large lots at tidewater: Tank, 1/4-in. and heavier, 1.75@1.85c.; tank, 3/16-in., 1.85@2c.; shell, 2.05c.;

flange, 2.15c.; marine, 2.25c.; firebox, 2.50c.; universals, 1.75@1.85c.

Steel Rails and Rail Fastenings.—The mills have plenty of work in hand and are firm on prices. Some fair-sized foreign contracts have been taken. We quote for standard sections, \$35 f. o. b. Eastern mills. Smaller rails are quoted: 12-lb., \$40; 16-lb., \$40; 20-lb., \$40; 30-lb. to 40-lb., \$38; 40-lb. to standard, \$36, with the usual advance for small orders. We quote angle bars, 2.30c.; fish plates, 2.30c.; spikes, 2.70c.

Structural Material.—The chief event of the week has been the opening of the bids for the approaches to the new East River Bridge. The New York Bridge Company, which is not in the recently formed bridge consolidation, bid \$1,500,000 for the Brooklyn approaches and \$1,000,000 for the New York approaches. The New Jersey Iron and Steel Company, the only other bidder, bid considerably higher. We quote in large lots at tidewater: Beams, 2.40@2.45c.; channels, 2.48@2.45c.; angles, 2.40c.; tees, 2.40c.

METAL MARKET.

New York, June 1.

Gold and Silver.

Gold and Silver Exports and Imports At all United States ports in April and year.

Table with columns: Metal, April (1899, 1900), Year (1899, 1900). Rows include GOLD Exports, Imports, SILVER Exports, Imports, and Total.

This statement includes the exports and imports at all United States ports, the figures being furnished by the Treasury Department.

Gold and Silver Exports and Imports, New York For the week ending May 31st, 1900, and for years from January 1st, 1900, 1899, 1898, 1897.

Table with columns: Period, Gold (Exports, Imports), Silver (Exports, Imports), Total Excess, Exp. or Imp. Rows for Week, 1900, 1899, 1898, 1897.

Imports and exports of gold were in small lots, from and to various ports. Imports of silver were from Mexico and South America; exports chiefly to Great Britain.

The United States Assay Office in New York reports the total receipts of silver at 67,000 oz. for the week. Total since January 1st, 2,149,000 oz.

Average Prices of Silver per oz. Troy.

Table with columns: Month, 1900 (London, N.Y.), 1899 (London, N.Y.), 1898 (London, N.Y.). Rows for Jan through Dec and Year.

The New York prices are per fine ounce; the London quotation is per standard ounce, 925 fine.

Average Prices of Metals per lb., New York.

Table with columns: Month, COPPER, TIN, LEAD, SPLITTER (1900, 1899). Rows for Jan through Dec and Year.

Commencing with March 17th, the prices given in the table for copper are the averages for electrolytic copper; this is the case for both 1899 and 1900. The average price for Lake copper for the year 1899 was 17.61c. For January, 1900, the average price of Lake copper was 16.33c.; for February, 16.08c.; for March, 16.55c.; for April, 16.94c.; for May, 16.55c.

Prices of Foreign Coins.

Table with columns: Bid, ASKED. Rows for Mexican dollars, Paravian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Twenty marks, Spanish 25 pesetas.

Imports and Exports of Metals.

Table with columns: Port, Week, May 30 (Expts, Impts), Year 1900 (Expts, Impts). Rows for New York, Baltimore, Philadelphia, and Total United States.

Table with columns: Articles, April, 1900 (Expts, Impts), Year 1900 (Expts, Impts). Rows for Antimony, Copper, Iron, Iron & steel plates, Lead, Manganese, Nickel, Steel, Zinc.

*New York Metal Exchange returns. †By our Special Correspondent. ‡Not specified. §Report of Mr. John Stanton, Treasury Department. ¶Week ending May 22d. Exports include domestic and foreign metals.

Import Duties on Metals.

The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 3/4c. lb. Lead, 1/2c. a lb. on lead in ores; 2/4c. per lb. on pigs, bars, etc.; 2/4c. on sheet, pipe and manufactured forms. Nickel, 6c. per lb. Quicksilver, 7c. per lb. Spelter or zinc, 1/4c. per lb. on pigs and bars, 2c. on sheets. etc. Copper, tin and platinum are free of duty.

Financial Notes of the Week.

Business continues steady and without special event. The financial markets have been quiet and somewhat dull, though news from all quarters has been favorable.

The silver market has ruled extremely dull and steady at slightly lower quotations. The drop in sterling exchange has also reduced New York prices.

The statement of the United States Treasury on Wednesday, May 29th, shows balances in excess of outstanding certificates as below, comparison being made with the statement of the corresponding day last week:

Table with columns: Item, May 21, May 29, Changes. Rows include Gold, Silver, Legal tenders, Treas notes, etc.

Treasury deposits with national banks amounted to \$112,337,343, showing an increase of \$1,711,553 for the week.

The statement of the New York banks—including the 63 banks represented in the Clearing House—for the week ending May 26th, gives the following totals, comparisons being made with the corresponding weeks in 1899 and 1898:

Table with columns: Item, 1899, 1898, 1900. Rows include Loans and discount, Deposits, Circulation, Reserve, Specie, Legal tenders, Total reserve, Legal requirements, Balance surplus.

Changes for the week this year were increases of \$4,695,600 in loans and discounts, \$7,990,000 in deposits, \$342,500 in circulation, \$1,783,300 in specie, \$2,471,300 in legal tenders, and \$2,257,100 in surplus reserve.

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

Table with columns: Banks, 1899 Gold, 1899 Silver, 1900 Gold, 1900 Silver. Rows include N.Y. Ass'd., England, France, Germany, Spain, Aus.-Hun., Neth'lds, Belgium, Italy, Russia.

The returns of the Associated Banks of New York are of date May 26th and the others are of date May 24th, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to May 17th, 1900, are reported by Messrs. Pixley & Abell's circular as follows:

Table with columns: Country, 1899, 1900. Rows include India, China, The Straits, Totals.

Arrivals for the week this year were £250,000 in bar silver from New York and £21,000 from Australia; total, £271,000. Shipments were £120,000 in bar silver to Bombay and £102,500 to Calcutta; total, £222,500.

Indian exchange has been firmer, with a better demand for Council bills in London. The average rate for the week was 15.98d per rupee. It is understood that the Indian Government is about to place a new issue of 3 crores of rupees in rupee paper in India.

Imports of specie by water at San Francisco for the four months ending April 30th are reported as follows:

Table with columns: Coin, Gold, Silver, Total. Rows include Bullion, Totals.

The imports were from the following countries: Mexico, \$870,510; British Columbia, \$26,677; Central America, \$22,741; Australia, \$5,630; China, \$4,348; Japan, \$2,122,500; South America, \$1,280; Hawaiian Islands, \$209,140. The specie from Japan was in gold yens. This coin was converted into American coin at the local Mint. The specie last month from Honolulu consisted of American gold coin.

Other Metals.

Daily Prices of Metals in New York.

Table with columns: Metal, Price. Rows include Silver, Copper, Spelter, Lead, Tin, etc.

London quotations are per long ton (2,240 lbs.) standard copper which is now the equivalent of the former g. m b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes is usually 0.25c. lower than these figures.

Copper.—The market is very quiet. The few transactions we hear of appear to have taken place at lower figures. From what we learn it appears that the stocks in the hands of manufacturers are much depleted and larger orders can soon be looked for. We quote Lake, 16@16 1/4; electrolytic copper in cakes, wirebars and ingots at 15 1/2@16c.; in cathodes at 15 1/2c.; casting copper at 15 1/2@15 3/4c.

The London market for speculative sorts has been somewhat firmer under the influence of political developments. It closed last week at £72 10s. for spot, £72 2s. 6d. for three months. It opened this week at £71 10s. for spot, £70 10s. for three months, advanced on Tuesday to £72 7s. 6d. for spot, £72 2s. 6d. for three months, and on Thursday to £73 5s. for spot, £73 for three months. It closes at £72 2s 6d for spot, £72 5s for three months. Our cables report that statistics for the second half of May show an increase of 2,200 tons.

Refined and manufactured sorts we quote: English tough, £77@£78; best selected, £77 10s.@£79; strong sheets, £87@£88; India sheets, £84@£85; yellow metal, 7 1/2d.

Tin.—Our market has ruled very quiet. Prices here have not followed the advance in London, which is ascribed to the scarcity of spot stocks at that point. Stocks on this side are fair and, with the large quantities afloat, no scarcity is to be anticipated. We quote tin here at 29 1/2c.

In London the market, which closed last week at £133 10s. for spot, £129 for three months, opened at £134 for spot, £129 10s. for three months. On Tuesday it was £136 for spot, £131 for three months, and on Thursday £137 for spot, £132 for three months. It will be observed that the backwardation is now £5. It closes at £137 for spot; £132 10s. for three months. Statistics for the month of May are reported as showing an increase of 1,500 tons.

Lead.—The prices of this metal have not changed, but it appears that at present values large transactions are being made. We quote New York 3.95@4c.; St. Louis 3.80@3.85c.

The market abroad is again somewhat higher, Spanish lead being quoted £17 2s. 6d., English lead 2s. 6d. higher.

Imports of lead into the United States and re-exports of foreign lead refined here, for the four months ending April 30th, are reported by the Bureau of Statistics of the Treasury Department as below, in pounds:

Table with columns: Item, 1899, 1900. Rows include Lead in ores and bullion, Lead, metallic, Total imports, Exports of foreign lead.

Excess, imports..... 16,583,024 1,862,888 The decrease in imports this year was 1,598,603 lbs., or 2.4%; the increase in exports was 13,121,533 lbs., or 25.1%. Of the lead imported this year 59,221,229 lbs. (88.0%) came from Mexico, 6,522,386 lbs. (9.7%) from Canada, and 1,581,480 lbs. (2.3%) from other countries. The April imports from Canada were large, 3,354,783 lbs.

St. Louis Lead Market.—The John Wahl Commission Co. telegraphs us as follows: Lead is dull and uninteresting. Missouri lead is quoted at 3.90c., and argentiferous, 3.95c., with light sales at these rates.

Spelter.—The market remains without new feature. A fair business is doing at last week's prices, and we quote 4.50c. New York, 4.37 1/2@4.40c. St. Louis.

In the European market good ordinaries are selling at £21 5s., specials 5s. higher.

Exports of spelter or metallic zinc from the United States in April were 6,197,466 lbs., against 2,861,330 lbs. last year. For the four months ending April 30th the exports were 18,471,398 lbs., against 12,234,927 lbs. in 1899; an increase of 6,236,471 lbs., or 50.9%. Exports of zinc ore for the four months were 11,930 tons, against 9,630 tons in 1899; an increase of 2,300 tons, or 23.9%, this year.

Antimony.—We quote Cookson's 10 1/2c.; Hallett's, 9 1/2c.; U. S. Star, 9 1/2@9 3/4c.

Nickel.—The price has again risen, and is now 50 to 60c. per lb., according to size and terms of order.

Platinum.—Consumption has increased and prices are higher. For ingot platinum in large quantities \$18.20 per Troy oz. is quoted in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 70 1/2c. per gram.

Quicksilver.—The New York quotation in unchanged at \$51 per flask for large lots; for small orders \$52.50@54 is asked. San Francisco quotations are \$51.50 for local deliveries, and \$46.50@47 for export.

The London price continues £9 10s. per flask, with the same figure quoted from second hands. Exports of quicksilver from all United States ports in April were 111,929 lbs. For the four months ending April 30th the exports were 430,933 lbs., against 475,166 lbs. in 1899; a decrease of 44,233 lbs., or 9.3%, this year.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as below:

Table with columns: Metal, Price. Rows include Aluminum, Ferro-Titanium, Ferro-tungsten, Magnesium, Manganese, Nickel-alum, Rismuth, Chromium, Copper red oxide, Ferro-Molyb'dum, Tungsten.

Variations in price depend chiefly on the size of the order.

LATE NEWS.

(From Our Special Correspondent.)

Pittsburg, Pa., May 30th.—The past week has seen big concessions in all kinds of pig iron, with the exception of Bessemer, the quotations of which are held merely nominal at \$24.90 Pittsburg by the Association. The foundrymen, who have been holding off in making contracts for extended deliveries, have during the past week been offered No. 2 Foundry at \$20. Despite this offer, there was no buying except in carload lots. On forge iron it is reported that \$18 to \$18.50 is being done on small lots. Owing to the condition of the market, it is altogether probable that a number of furnaces in the Valley district will be blown out on July 1st. A number of them are badly in need of repairs, while others will close down to prevent the glutting of the market with all kinds of iron at a time when there is so decided a downward tendency. Steel billets have taken another drop, being quoted at \$28, at mill, Pittsburg. The steel billet men's association is still quoting \$35, but no actual transactions are reported at that figure.

Local mills are holding 4x4 steel billets at \$28, but it is doubtful if this price could be secured on anything less than a 1,000-ton lot. There is absolutely nothing doing in sheet bars. Open-hearth billets are held at \$32. Tank plates are being sold at 1.60 and other varieties of plates are correspondingly lower. Cutting on steel bars by independent mills continues, although they are held nominally at 2c. Pittsburg. The American Steel Sheet Company has failed to issue a list of discounts with differentials to the trade. Jobbers are holding No. 28 gauge at 3.20 @3.25c. and No. 27 10c. less. Galvanized sheets are quoted at 70 and 10% off, with the usual 15-cent freight allowance.

The production and shipments of Connellsville coke continue to fall off, owing to the dullness in the iron trade. The H. C. Frick Coke Company has ordered the shutting down of 10% of its coke ovens this week. As the Frick Company owns about two-thirds of the ovens in the Connellsville region, this means a closing down of over 1,000 ovens and curtails the production about 800 tons a day. The big falling off in shipments is attributed partially to the fact that furnace owners are now beginning to use coke they have in stock and are waiting for lower prices. At the opening of the year furnace coke was sold at \$3 a ton, but the price was soon advanced to \$4. It has since dropped to \$3.50, and this week can be bought as low as \$3.25. Foundry coke is about 25c. a ton higher. The shipments for the week aggregated 9,639 cars, distributed as follows: To Pittsburg and river tipples, 2,794 cars; to points west of Pittsburg, 4,617 cars; to points east of Connellsville, 2,228 cars. This is a decrease compared with the shipments of the previous week of 146 cars.

By Telegraph.

Cleveland, Ohio, May 31st.—In the United States Appellate Court the Cowles case against the Carborundum Company has been decided, the Court sustaining the Cowles patents.

(The United States Circuit Court, in July, 1897, decided that the Achison carborundum furnace did not infringe the Cowles patents. See "Engineering and Mining Journal," February 20th, February 27th, March 13th, June 5th and July 31st, 1897.—Editor E. & M. J.)

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 670.)

New York. June 1.

The imports and exports of chemicals, etc., at all United States ports in April were as below:

Articles.	April.		Year, 1900.	
	Imports.	Exports.	Imports.	Exports.
Bleaching Powder, lbs....	14,065,445	123,372	56,020,822	123,824
Caustic Soda, lbs....	1,340,100	110,366	3,674,477	343,247
Sol Soda, lbs....	313,750		1,632,196	
Soda Ash, lbs....	8,260,217	9,161	38,732,247	17,661
Chlorate of Potash, lbs....	112,550		379,139	120,720
Copper Sulphate, lbs....		9,027,165		31,237,859
Nitrate of Soda, tons....	14,714	283	44,701	954
Muriate of Potash, lbs....	5,286,801	140,464	26,939,548	255,258
Phosphate rock, tons....	5,632	65,771	35,574	208,278
Pyrites " " " " " "	22,426		106,403	
Brimstone " " " " " "	18,127	51	61,327	257
Sulphur, lbs....	707,715	947	4,558,826	947

All imports showed a decrease in April as compared with March, excepting in caustic soda and nitrate of soda. The exports were larger in nearly all articles.

Heavy Chemicals.—Quiet. Some more 1901 contracts for domestic high-test caustic soda were booked at \$1.80@1.85 per 100 lbs. f. o. b. works. In purchasing the plants of Bowman, Thompson & Co. at Lostock Graham and Liverpool, Messrs. Brunner, Mond & Co. are to pay \$350,440 (\$1,752,200), which includes all assets except the un-called capital of Bowman, Thompson & Co. The debenture holders in the latter company are to receive £94,500 of the purchase money. The balance of the entire purchase money distributable among the shareholders is £66,000, fully-paid £10 preference shares taken at £11 each, and £189,940 £8 paid ordinary shares taken at £8 each. The value of Brunner, Mond & Company's shares, as agreed between each company, is £17 for each £10 preference and £5 for each £1 ordinary. It is proposed that the whole of Bowman, Thompson & Company's portion of the purchase money shall be satisfied by the allotment of preference and ordinary shares of Brunner, Mond & Company at these values, in such proportion as the selling company sees fit. It is also agreed that, in consideration of £7,000 paid to the directors other than Manager Howitt, none of them shall for 15 years at any place within the United Kingdom, or any British colony or possession, be concerned or interested in the manufacture of ammonia soda or its by-products. Manager Howitt is to receive £5,000 from Brunner, Mond & Company to satisfy his interests in the selling company. At a recent directors' meeting of Brunner, Mond & Company a dividend of 40% was declared, making with the interim dividend 35% for the year, or 5% more than the previous year. Bowman, Thompson & Company have also declared a 7½% dividend on its ordinary shares and 7% on the preferred. The net trading profit of this company for the year is nearly £13,000, which added to £8,000 brought forward, makes £21,000. The suit of the Castner-Kellner Alkali Company against the Commercial Development Company over the Rhodin caustic soda process is now up in the Court of Appeals in London, Eng. It is expected that the suit will soon be decided.

We quote per 100 lbs. as below:

Articles.	Domestic.		Foreign.
	F.o.b. Works.	In New York.	In New York.
Alkali, 58%.	80@85	95@1.00	85@90
" 48%.	85@90	1.00@1.05	1.02½@1.05
Caustic Soda, high test.	\$1.52½@2.00	2.25@2.30	\$2.50@2.60
powd., 60%.		3.00@3.25	
70@74%.		3.25@3.50	
98%.		3.50@4.00	
Sol Soda.....	70@80.		67½@72½
" conc.	1.45@1.75		1.60@1.65
Bicarb Soda.....	1.25@1.37½		1.75@2.00
" extra	3.25@3.50		
Bleach Pdr., Eng. prime.			1.75@1.87½
other br'nds.			1.50@1.75
Cal. Pot. cryst.		9.25@9.50	10.25@10.50
powd.		9.50@9.75	10.50@10.75

Brimstone.—Arrivals at New York this week amount to 2,500 tons. Market is very quiet. Spot best unmixd seconds sold at \$21.25@21.50 per ton, while shipments are quoted at \$21@21.25. Best thirds hold at \$2 less per ton. In Sicily the f. o. b. price for best unmixd seconds is about \$18.42 per ton, and best thirds \$16.26. Freight rates to Atlantic ports are 10s. to 11s., which would make the cost of best unmixd seconds in New York about \$20.94 per ton and thirds \$18.78.

Bichromate of Potash.—Competition is keen and the American makers have reduced their price to 8½c. per lb. in large lots. This is the lowest figure ever reached.

Cobalt.—Carbonate is higher at \$1.75 per lb.;

nitrate at \$1.55 per lb.; oxide, \$2.36 per lb. for black, and \$2.75 for gray.

Acids.—This market is quiet. Blue vitriol and oxalic acid are easier.

Quotations as below are for large lots delivered in New York and vicinity, per 100 lbs. unless otherwise specified.

Acetic, No. 8 in lbs....	\$1.62½	Nitric, 36°	\$3.87½
Blue Vitriol.....	5.00@5.12½	Nitric, 38°	4.12½
Aqua Fortis, 36°.....	3.62½	Nitric, 40°	4.37
Aqua Fortis, 38°.....	3.87½	Nitric, 42°	4.75d.
Aqua Fortis, 40°.....	4.12½	Oxalic.....	.575@.60
Aqua Fortis, 42°.....	4.50	Sulphuric, 60°.....	1.20
Muriatic, 15°.....	1.20	Sulphuric, 68°.....	1.05
Muriatic, 20°.....	1.35	" bulk 50° ton.....	14.00
Muriatic, 22°.....	1.50		

Pyrites.—Another lot of 3,172 metric tons of copper pyrites were imported from Spain this week by the Pennsylvania Salt Manufacturing Company. Business is steady and prices are unchanged.

We quote: Mineral City, Va., lump ore, \$4.75 per long ton (basis 42%), and fines, \$4.20. Charlemon, Mass., lump, \$5.50, and fines, \$5. Spanish pyrites, 13@15c. per unit, according to percentage of sulphur contents, delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46%@51% of sulphur; American, 42% @44%.

Fertilizing Chemicals.—Featureless. The Fisheries Company, with \$3,000,000 capital, has been incorporated to succeed the American Fisheries Company (the old menhaden trust). Of this capital \$2,000,000 is in 7% non-cumulative preferred stock, and \$1,000,000 common stock. The president is Thomas Russell, and the vice-president N. B. Church.

Sulphate of ammonia gas liquor is easy at \$2.85@2.87½ per 100 lbs., at which large sales of domestic are reported. Tankage is unsettled at \$1.85@1.90 and 10 per unit, f. o. b. Chicago for 9 and 20. Domestic steam ground bone is worth \$18@19 per ton as to purity. Other quotations are: High-grade Western blood, \$2 per unit, f. o. b. Chicago; fish scrap, dried, \$21@21.50 per ton, f. o. b. factory; Calcutta bone meal, No. 2, \$25 per ton, and No. 3, \$23; bone black, spent, \$15@16 per ton.

The prices for potash salts at New York, Boston and Philadelphia, per 100 lbs., are as follows: Muriate of potash, 80@85%, basis 80%, \$1.83; muriate of potash, minimum 95%, basis 80%, \$1.86; sulphate of potash, minimum 90%, basis 90%, \$2.05½; sulphate of potash, minimum 96%, basis 90%, \$2.08½; manure salt, minimum 20% potash, 64@66c.; double manure salt, 48@53%, basis 40%, \$1.06; kainit, 12.4% potash, \$9.05@9.30 per long ton; and sylvinit, 38½@39½c. per unit. For Norfolk prices add 2c. per 100 lbs. to the concentrated salts, except double manure salt, to which add 1c., and for kainit add 30c. per ton, and sylvinit 1c. per unit. For Charleston, Savannah, Wilmington, N. C., and New Orleans, add 1½c. per 100 lbs. to the concentrated salts, except 20% manure salt, to which add 1c.; and to kainit add 20c. per ton, and sylvinit 1c. per unit. These prices are for not less than 500 tons of bulk salts or 50 tons of concentrated salts, and are based upon river shipments from the mines to seaport. For shipments by rail add 5c. per 100 lbs.

Nitrate of Soda.—Quiet. Spot is quoted \$1.77½ per 100 lbs., and futures at \$1.72½ up, according to position.

Concerning the market in Chile we are advised by Messrs. Jackson Brothers of Valpariso under date of April 21st that business is very slack owing to the absence of orders due to the nominal condition of the European market. The absence of spot tonnage has prevented transactions in early deliveries for which sellers have offered their produce freely. For forward deliveries producers have higher ideas and show no inclination to meet buyers' limit. The March production was 2,671,500 qtls., making a total for the three months of 7,520,000 qtls., as against 6,767,500 qtls. in 1899. Consumption for the three months was 11,602,000 qtls., as against 10,831,000 qtls. in 1899. We quote 95% April-May, 4s. 11½d.; June, 5s.; July, 5s. 1d.; August, 5s. 2d.; and 96%, May, 5s. 2d.; June-July, 5s. 3d., all sellers ordinary terms. The price of 4s. 11½d., with all-round freight of 33s. 9d., stands in 7s. 2½d. (\$1.73) per cwt. net cost and freight without purchasing commission.

Phosphates.—Operations in Florida rock region are being curtailed by the large plants. Recently only 48 plants were at work, which compares with 76 at the opening of this year. In the pebble region eight plants are reported in operation. On account of Italian consumers of pebble phosphates a leading German house recently took orders aggregating about 60,000 tons, for delivery from 1900 to 1902 inclusive. The price is reported at 6½d. per unit (\$9.10 per ton), c. i. f. Venice. The quantity and freight rates are said to have been fixed with the miners.

In Tennessee the miners in the Association and some of the others are reported to be curtailing their output with a view to maintaining prices. Sales, however, are understood to have been made recently at \$3@3.25 per ton for domestic rock and \$3.50@3.75 for export, f. o. b. Mt. Pleasant, hence quotation below are nominal. Abroad buyers are under contract in many cases for the whole of 1901, while the deliveries

now being made are chiefly on contracts taken in 1899.

In South Carolina business is fair. The recent official inspection showed that hand pickers at the larger mines were being paid \$1 per ton for the rock gathered and laborers averaged \$5 to \$8 a week at this work.

The Christmas Island phosphate people are energetically pushing their product in the European market. For 80@85% rock they are asking 8½d. per unit, or about \$14 per ton, c. i. f. United Kingdom or North Sea ports.

We quote as follows:

Phosphates.	Per Ton F. o. b.	C. i. f. Un'd Kingdom or No Sea Ports.	
		Unit.	Long ton.
*Fla. hard rock (77@80%)	\$7.50@8.00	8@8½d	\$12.48@12.87
*Fla. land pebble (68@73%)	4.35.....	7d	9.80
*Fla. Peasco River (58@63%)	3.00@3.50	6¼@6½d	7.80@7.95
†Tenn. rock, 78%, export.	4.00@4.25	7½@7¼d	11.15@11.31
†Tenn.....78% domestic.	3.50.....		
†Tenn.....75% "	3.00@3.25		
†Tenn.....72% "	2.65@2.75		
†So. Car. rock, undried.	3.75@4.00		
†So. Car. rock, dried....	4.50@4.75		
†So. Car. rock, ground....	6.00.....		
Algerian, rock.....(63@70%)		7d	9.30
Algerian, rock.....(53@63%)		6½d	8.18

*Fernandina. †Mt. Pleasant. ‡Fetteressa.

Liverpool.

May 15.

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

Outside of deliveries on running contracts there is not much activity to report in chemicals, although at the same time, exports in the ordinary heavy lines are on a fairly liberal scale, with the exception of bleaching powder, which article is moving less freely. The purchase of Messrs. Bowman, Thompson & Co.'s works by Messrs. Brunner, Mond & Co., which has been an open secret in the trade for some time past, was officially announced last week.

Soda ash is unchanged for export, while for home consumption the price of 58% alkali has been advanced. We quote nearest spot range for tierces as follows: Leblanc ash, 48%, £4 15s; 58%, £5 5s@£5 10s per ton, net cash. Ammonia ash, 48%, £4 5s@£4 10s; 58%, £4 10s@£4 15s per ton, net cash. Bags, 5s per ton under price for tierces. Soda crystals are in demand and generally selling at £3 2s 6d per ton, less 5% for barrels, with an allowance of 7s per ton if taken in bags, with special terms for a few favored markets. Caustic soda is firm as regards the lower strengths, and dearer for high test, the latter being very scarce. We quote spot range, as follows: 60%, £9 5s; 70%, £10 5s; 74%, £10 15s@£10 17s 6d; 76%, £11 5s@£11 10s per ton, net cash.

Bleaching powder is very slow of sale, buyers being mostly filled up on contract, and prices for hardwood are nominally about £6 15s@£7 per ton net cash.

Chloride of potash is inactive and nominally quoted at 4¼@4½ per lb. net cash, with little doing to test the market.

Bicarb soda is selling at varying prices according to destination, ranging from £5 5s@£6 15s per ton, less 2½% for the finest quality in 1 cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia continues dull and quotations for good gray 24@25% in double bags, f. o. b. here, may be called about £11 10s@£11 12s 6d per ton, less 2½%.

Nitrate of soda is rather firmer at £8 12s 6d@£8 17s 6d per ton, less 2½% for double bags, f. o. b. here, as to quality and quantity.

MINING STOCKS.

Complete quotations will be found on pages 667 and 668 of mining stocks listed and dealt in at:

Boston.	Philadelphia.	Montreal.
Colo. Springs.	Spokane.	London.
Denver.	Salt Lake.	Mexico.
New York.	San Francisco.	Paris.
	Toronto.	

New York.

June 1.

Quiet, owing to the Decoration Day holiday. The copper shares were almost featureless. Amalgamated sold at \$88, and Anaconda down to \$40½. Union of North Carolina softened on sales to \$4½, and British Columbia to \$9½. American Smelting and Refining common brought \$37½@37, and the preferred \$88½@88½. Moulton of Montana made a sale at 25c., Ophir of Nevada at 64c., and Sierra Nevada at 33c. Isabella of Colorado sold at \$1.25, Argentine—Junata at 20c., Alamo at 14½c., and Little Chief at 18c. Portland caused a sensation by advancing to \$3.35 on sales. Of the 3,000,000 share capital 2,000,000 shares are held by Messrs. James F. Burns, W. S. Stratton and John Harman of Colorado Springs and Senator Shannon of New York. Of the remaining 1,000,000 shares it is said a Colorado Springs brokerage firm holds 700,000 shares. In Colorado Springs the stock recently sold at \$3.50, and it is reported an eastern party has bid this price for a block of the stock. Rumors of a pending deal in the property actuated this advance in price.

On the curb effort was made recently to sell shares in the Great Lakes Copper Company, capitalized at \$3,000,000, and claiming property

in the Sudbury District, Ontario. The \$5 par value shares were reported sold in small lots at \$2.90@2.95.

Boston. May 29.

(From Our Special Correspondent.)

The topic of discussion this week has been the fire in the Calumet & Hecla Mine. Quite possibly the estimates of damage done are exaggerated;

The fire and the reduction of the dividend to \$10 brought down the quotation for the stock to \$695, the first Calumet and Hecla has sold under \$700 for a long time.

Amalgamated was hardly mentioned. Boston & Montana was quoted at \$295; Butte & Boston, \$64; Parrot, \$41½; Utah, \$25½@26.

In the gold stocks Cochiti brought \$9½; Gold Dredging, \$2½; Santa Ysabel, \$1½.

The general list was somewhat firmer. Dominion Coal sold at \$42½@43; New England Gas and Coke, \$16½; United States Oil, \$15½; Montana Coal and Coke, \$8.

The Calumet and Hecla dividend declared this week is \$10 only. It was \$20 last June, and also \$20 three months ago.

The holiday to-morrow aids in keeping the market very dull and quiet.

Colorado Springs. May 26.

(From Our Special Correspondent.)

By far the most important event of the week, or, in fact, the past six months, was the admission to-day to the Colorado Springs Mining Stock Association of 15 of the leading members of the Board of Brokers' Association.

The market, on the whole, showed a gain; although the volume of business was smaller than last week, the cash valuation of the stocks was in excess.

The Elkton-Raven-Tornado consolidation, which will be effected June 4, has occasioned renewed strength in these three companies.

Another special feature was Gold Coin, which sold up to \$5.50. This is the highest price per share ever paid for any stock traded in on the Exchange.

One feature of the week's market has been the calling upon the stockholders for 15c. per share voluntary contribution by the directors of the Anaconda Company.

The total sales for the week on the Mining Stock Exchange was 2,409,389 shares, with a cash value of \$473,596.

Salt Lake City. May 20.

(From Our Special Correspondent.)

Trading in Utah mining shares is about at low water mark, the reported sales on the Exchange for the past week being 37,830 shares, which sold for \$59,889.

Bullion-Beck shows strength, the recent ore uncoverings on the south end being the cause. Daly-West has been an active trader.

Mammoth shares soften, and the dividend promised for next week is again side-tracked. May Day takes the lead drop hard, and can be had around 90.

San Francisco. May 26.

(From Our Special Correspondent.)

The market was generally dull, though prices were fairly maintained. The outside business was in sight and matters were left pretty much to the chippers.

Some quotations noted are: Consolidated California and Virginia, \$1.40@1.45; Caledonia, \$1.35 @1.40; Sierra Nevada, 30c.; Hale & Norcross, 23 @24c.

The Oil Exchange was more active, with a special demand for the stocks of producing companies. Some quotations noted are: Blue Goose, \$15.50@16; Home, \$4.60@4.65; Yukon, 95c.

London. May 22.

(From Our Special Correspondent.)

The chief center of interest in the mining market just now is not the South African section, but the West Australian. Your readers will remember that the management and directors of some of the Kalgoorlie mines has been very freely criticised by the shareholders and people in a position to know.

The disclosures made in these reports show that the management has been deplorable in every way. Development work had been neglected, metallurgical treatment not understood and money thrown away in all sorts of ways.

Another special feature was Gold Coin, which sold up to \$5.50. This is the highest price per share ever paid for any stock traded in on the Exchange.

One feature of the week's market has been the calling upon the stockholders for 15c. per share voluntary contribution by the directors of the Anaconda Company.

Paris. May 20.

(From Our Special Correspondent.)

The mining stock market shows somewhat more activity, though we have by no means attained the buoyancy which was expected to follow the opening of the Exposition.

The copper market seems to have a downward tendency, and the copper stocks are weaker accordingly.

The South African gold stocks remain somewhat dull, in spite of the successful advance of the British. The most depressing influence in the market is the growing belief that much damage will be done to the mines, or at least to the mills, should the Boers be forced back to Johannesburg.

The foreign merchandise trade of France for the four months ending April 30th is given by the Ministry of Commerce as below:

Table with 3 columns: Imports, Exports, Excess, imports. Rows for 1899, 1900.

The imports increased 39,376,000 fr., or 2.5%, while the exports increased 66,061,000 fr., or 5.3%; leaving a decrease of 26,685,000 fr., or 8.6%, in the excess of imports.

The letters from the Transvaal which have appeared in the "Engineering and Mining Journal" are much appreciated. They are the only reliable news we have direct from the mines themselves.

DIVIDENDS.

Table with 4 columns: NAME OF COMPANY, Date, Per share, Total. Lists various companies and their dividend details.

* Monthly. † Quarterly. § Semi-annual.

ANNUAL MEETINGS.

Table with 4 columns: Name of Co., Locat'n, Date, Place of Meeting. Lists companies and their annual meeting details.

*Special meeting.

ASSESSMENTS.

Table with 5 columns: NAME OF COMPANY, Loca tion, No, Delinq, Sale, Amt. Lists companies and their assessment details.

STOCK QUOTATIONS.

Table with columns: NAME OF COMPANY, Location, Par. val., May 25, May 26, May 28, May 29, May 30, May 31, Sales. Includes companies like Acacia, Alamo, Amalgamated C, Anaconda, etc.

Table with columns: NAME OF COMPANY, Par. val., No. of shares, May 24, May 25, May 26, May 28, May 29, May 30, Sales. Includes companies like Adven's Cons, Aetna, Cons. g., Aloues, etc.

Table with columns: NAME OF COMPANY, Par. val., May 25, May 26, May 28, May 29, May 30, May 31, Sales. Includes companies like Am. Sm. & Ref, Am. S. & W. Con, Am. Tin Plate, etc.

Table with columns: NAME OF COMPANY, Par. val., No. of shares, Bid, Asked, Sales. Includes companies like Ajax, Alcoa, Buckeye, Bullion-Bank & Ch., etc.

Table with columns: NAME OF COMPANY, Location, Par. val., May 24, May 25, May 26, May 28, May 29, May 30, Sales. Includes companies like Am. Alkali, Bethlehem Iron, Cambria Iron, etc.

Table with columns: NAME OF COMPANY, Par. val., No. of shares, Bid, Asked, Sales. Includes companies like Ontario, Hamilton Ref, Olive, British Col., etc.

Table with columns: NAME OF COMPANY, Location, Par. val., May 24, May 25, May 26, May 28, May 29, May 30, Sales. Includes companies like Belcher, Best & Belcher, Caledonia, etc.

Table with columns: NAME OF COMPANY, Par. val., No. of shares, Bid, Asked, Sales. Includes companies like Butte & Boston, Confectionery, Crystal, etc.

Table with columns: NAME OF COMPANY, Location, Par. val., May 11, May 12, May 14, May 15, May 16, May 17, Sales. Includes companies like Anaconda, Blue Goose, Buckhorn, etc.

*California and Producers Oil Exchanges. Total sales, 4,970 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Acacia, Alamo, Anaconda, and others with columns for Par, May 21-26, and Sales.

Colorado Springs Mining Stock Exchange. Total sales, 1,288,546 shares.

MONTREAL CANADA.

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, and others with columns for Par, Week, and Sales.

Montreal Stock Exchange. Total sales, 193,683 shares.

MEXICO.

May 19.

Table of stock quotations for Mexico, listing companies like Durango, Barradon, and others with columns for No. of shares, Last div'd, and Prices.

DENVER, COLO.

Table of stock quotations for Denver, Colo., listing companies like Acacia, Anaconda, Arg., and others with columns for Par, May 19-25, and Sales.

Wire Gold... Total sales, 66,750 shares.

PARIS.

May 10.

Table of stock quotations for Paris, listing companies like Aciéries de Creusot, Firminy, and others with columns for Country, Product, Capital, Par value, and Prices.

LONDON.

May 18.

Table of stock quotations for London, listing companies like Alaska Goldfields, Anaconda, and others with columns for Country, Author capital, Par value, Last dividend, and Quotations.

DIVIDEND-PAYING MINES.

Table with columns: Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest), Name and Location of Company, Authorized Capital Stock, Shares Issued, Dividends (Paid, Total to Date, Latest). Rows list various mining companies and their financial details.

G., Gold. S., Silver. L., Lead. C., Copper. Z., Zinc. This table is corrected up to April 26th. Correspondents are requested to forward changes or additions.

CHEMICALS, MINERALS, RARE ELEMENTS, ETC.—CURRENT PRICES.

Table with multiple columns listing various chemicals and minerals such as Abrasives, Borax, Bromine, Cadmium, Calcium, Carbonate, Chloride, etc., along with their respective prices and units.

THE RARE ELEMENTS.

Table listing prices for rare elements like Barium, Beryllium, Boron, Cadmium, Calcium, etc., with columns for Cust. Meas. and Price.

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. This table is revised up to May 19. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.