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* Illustrated.

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On another page we give the first of a series of excellent articles on the great gold-field of the Witwatersrand in the Transvaal, which has been for the past three or four years a point of so much interest in the mining and financial worlds. The preliminary article, in the present number, treats generally of the geology of the Transvaal; in succeeding papers there will be given a special account of the banked beds on which the mines are located, and of the methods of mining and milling, the costs of exploitation, the wages and supply of labor, and the various other conditions affecting the gold-mining industry. The financial management of the companies, the returns secured and the capital invested will also receive attention.

These articles are by experts who have lived in the Transvaal and studied thoroughly the development of its mines. We believe that they will be a complete and fair presentation of the actual condition of the mining industry there, and will give our readers a clear idea of this great gold-field, which differs in so many ways from the older and longer-known auriferous regions of the world. Nowhere else has a great mining field been developed in so short a time; nowhere else has there been such an opportunity to apply the latest methods in mining and metallurgy on a great scale. The mistakes that have been made as well as the successes that have been secured are instructive, and the account of them which we purpose giving cannot fail to be interesting.

A few days ago it was announced by the press despatches that Governor Jones, of Arkansas, had refused to appoint delegates to the Gold Mining Convention, to be held in Denver next month. His reason for refusing to comply with the courteous request of the Governor of Colorado and the directors of the convention was that the word "silver" nowhere appeared, either in the invitation or in the circular letter setting forth the objects of the coming gathering. A similar opposition is manifested among many in Utah, Montana and Idaho, in spite of the fact that all but two of the promoters of the convention are earnest champions of free-silver coinage.

It is hardly worth while to consider why silver mining at this time is unattractive to capital; that such is the existing condition no one can gainsay. This condition must be accepted by the people of the mining regions, and those who desire to secure needed means for developing mines must present such propositions as will attract those having both money and inclination to venture. For the time being, gold and copper are in favor with many who in the past have found mining profitable and are inclined to invest again. Hence it would seem an excellent business move for the people of the Rocky Mountain area to unite in present to the world, through the agency of this convention, the gold and copper resources of that broad domain on their merits. If we understand aright, this is the sole purpose in view, and the deliberations of the delegates will have nothing at all to do with finance or politics, but simply to direct attention to and emphasize the many opportunities for profit-making investments in mining which ought to be, and undoubtedly will be, attractive to capital. There should be no ground for friction or misunderstanding of any kind and all should join with a will for the common good of the mining industry of the great West.

The incident above noted shows that many people misapprehend the purpose of the convention. Its managers will have to be correspondingly careful to exclude political discussion and to make it a mining convention entirely. As such it should be a success.

The Legislative Report on the Anthracite Coal Mines.

The report of the legislative committee on the condition of the miners in the anthracite coal regions of Pennsylvania seems to be a rather inconclusive document. The committee has much less to say about the general state of the trade than its fellow members who reported on the bituminous regions. That the anthracite companies are not paying dividends and in some cases are running behind is admitted; and the miners were found to be in quite as bad a condition as those in the bituminous coal districts. This result the committee attributes to low wages and to the practice prevalent in the trade of running the mines for a large part of the year on short time, reducing the miner's pay to an amount wholly insufficient for his support. In some respects the committee seems to have seen matters in a favorable light; as when the report says that the mine tenements, as a rule, are sufficiently roomy, in good condition and let at reasonable rates. The main reason for existing evils seems to the legislators to be the over-supply of labor, especially of imported or foreign labor, and the main remedy suggested is the reduction of this supply, though it is not clearly apparent how this is to be brought about. That the miners' earnings are extremely small at present is well known; but the only way of increasing them is by enlarging the output of coal so as to give the men more steady work, or by a rise in the mining rate, which the operators protest is impossible at present. Both remedies depend upon conditions of trade which cannot be affected by any legislative enactment.

The recommendations of the committee do not seem to be of any special importance. They include first a prohibition of all payment in orders, or any other form than cash; compulsory semi-monthly payments; the prevention of any form of discounting the miners' checks or pay-orders; some changes in the miners' examination law; the appointment of an inspector or inspectors to examine the coal as it comes from the mines, and lastly instructions to the representatives of the State in Congress to favor the passage of a stringent immigration law. The last recommendation is the one upon which the report lays the most stress.

It seems hardly necessary to discuss these recommendations in detail. They do not suggest any real remedy for existing evils. They are not

in the demand for anthracite induces the companies to keep up the rates of wages in order to have a sufficient supply of labor when a large demand for coal occurs. The exhaustion of the anthracite coal-fields seems probable before the solution for the difficulty investigated will have been found, and before the business of mining will become profitable.

United States Coal Production in 1896.

In the accompanying tables we give the statistics of the total production of coal and coke in the United States for 1896, as collected for *The Mineral Industry*, Volume V. The figures have been complete with the single

TOTAL PRODUCTION OF COAL AND COKE IN THE UNITED STATES. (In tons of 2000 lbs.)

States.	1895.			1896.		
	Tons.	Value.		Tons.	Value.	
		Totals.	Per Ton.		Totals.	Per Ton.
Bituminous:						
Alabama.....	5,680,410	\$5,680,270	\$1.00	5,747,698	\$5,460,314	\$0.95
Arkansas.....	797,424	1,993,569	2.50	899,750	2,001,937	2.25
California.....	80,115	240,345	3.00	69,449	158,135	2.25
Colorado.....	3,449,000	4,242,270	1.23	3,312,000	4,968,000	1.50
Georgia.....	414,310	364,593	0.88	246,012	214,080	0.87
Illinois.....	17,735,864	16,316,995	0.92	19,786,626	14,246,370	0.72
Indiana.....	4,312,084	4,086,480	0.95	4,068,124	3,152,796	0.77
Indian Territory.....	1,228,440	1,904,082	1.55	1,235,333	1,914,766	1.55
Iowa.....	2,995,836	5,076,434	1.27	2,404,508	5,085,725	1.27
Kansas.....	3,190,843	3,590,141	1.13	3,141,343	3,253,583	1.03
Kentucky.....	3,138,023	2,573,179	0.82	3,128,818	2,946,623	0.75
Maryland.....	3,479,499	3,061,959	0.88	3,627,425	3,192,130	0.88
Missouri.....	2,283,081	2,625,543	1.15	2,420,147	2,883,169	1.19
Montana.....	1,104,854	2,300,300	2.08	1,157,722	2,262,768	1.96
New Mexico.....	367,442	551,162	1.50	332,600	465,640	1.40
North Carolina.....	15,386	24,771	1.57	14,970	23,203	1.56
North Dakota.....	79,890	99,475	1.25	94,500	103,950	1.10
Ohio.....	13,683,879	11,904,975	0.87	12,912,608	10,071,834	0.78
Oregon.....	65,918	131,836	2.00	60,739	121,478	2.00
Pennsylvania.....	51,813,112	36,787,310	0.71	50,273,656	33,180,613	0.66
Tennessee.....	2,319,730	1,809,382	0.78	2,663,714	2,024,422	0.76
Texas.....	499,668	1,064,293	2.13	585,000	1,228,500	2.10
Utah.....	530,713	769,533	1.44	429,446	519,801	1.21
Virginia.....	1,083,229	812,421	0.75	1,018,237	763,677	0.75
Washington.....	1,184,619	3,553,857	3.00	1,295,313	3,562,110	2.75
West Virginia.....	12,355,113	8,895,681	0.70	12,541,382	8,778,967	0.70
Wyoming.....	2,197,914	3,077,080	1.40	2,273,928	2,946,106	1.30
Total bituminous { Short tons.....	137,086,346	\$123,547,936	\$0.90	137,331,048	\$114,930,647	\$0.84
} Metric tons.....	124,363,917	.....	1.00	124,585,909	.....	0.92
Cannel:						
Kentucky { Short tons.....	69,747	191,804	2.75	54,660	146,488	2.68
} Metric tons.....	63,274	.....	3.03	49,587	.....	2.95
Anthracite:						
Arkansas.....	103,247	309,741	3.00	103,420	310,260	3.00
Colorado.....	133,393	373,500	2.80	59,600	149,000	2.50
Pennsylvania.....	51,660,657	79,577,411	1.54	48,692,543	87,646,577	1.80
Total anthracite { Short tons.....	51,897,297	\$80,250,652	\$1.54	48,855,563	\$88,105,837	\$1.80
} Metric tons.....	47,080,919	.....	1.70	44,321,476	.....	1.98
Grand total coal { Short tons.....	189,053,390	\$303,990,392	\$1.08	186,241,271	\$203,182,972	\$1.09
} Metric tons.....	171,508,110	.....	1.19	168,956,972	.....	1.20

States.	1895.			1896.		
	Tons.	Value.		Tons.	Value.	
		Totals.	Per Ton.		Totals.	Per Ton.
Alabama.....	1,232,242	\$2,094,811	\$1.70	1,247,028	\$2,057,596	\$1.65
Colorado.....	310,350	621,900	2.00	324,700	674,100	3.00
Georgia.....	90,620	144,086	1.58	55,467	88,737	1.60
Illinois.....	3,200	5,280	1.65	2,900	4,640	1.60
Indiana.....	4,760	8,330	1.75	4,890	7,610	1.55
Indian Territory.....	7,000	16,590	2.38	7,156	16,816	2.35
Kansas.....	8,350	16,700	2.00	8,147	16,294	2.00
Kentucky.....	25,453	40,725	1.60	24,519	36,778	1.50
Montana.....	61,378	506,417	8.25	63,694	461,260	7.26
New Mexico.....	1,309	3,024	2.31	779	1,791	2.30
Ohio.....	17,150	27,905	1.59	16,184	27,998	1.73
Pennsylvania.....	8,922,329	12,848,154	1.44	6,613,180	10,581,088	1.60
Tennessee.....	371,740	557,610	1.52	332,746	499,019	1.50
Utah.....	34,265	75,383	2.20	32,491	71,480	2.20
Virginia.....	137,826	203,982	1.49	131,400	193,138	1.47
Washington.....	7,318	43,918	6.00	22,368	89,472	1.45
West Virginia.....	1,248,574	1,785,461	1.43	1,452,392	2,105,968	4.00
Wyoming.....	9,000	18,000	2.00	19,543	38,086	2.00
Total coke { Short tons.....	12,493,464	\$19,018,276	\$1.52	10,359,584	\$17,271,871	\$1.67
} Metric tons.....	11,333,996	.....	1.68	9,398,153	.....	1.84

(a) Fiscal year.

likely to receive much attention from the Legislature at the present session, nor probably at any future one.

The difficulties in the anthracite trade are not mysterious; they have prevailed in more or less aggravated form since the mines were opened three-quarters of a century ago. There can be but two ways of bringing profits to the operators, one by increasing market prices of anthracite, the other by reducing costs of production. The first is beyond the control of the operators, being regulated by the vast supply of bituminous coal. A reduction in cost of production can be effected only by reductions in wages, increasing output or by improvements in mining practice which would result in the employment of fewer men for the same output. The average earnings of the workmen have been very low; the rates of wages are comparatively high, so high in fact that they attract a superabundance of labor. A lower rate of wages with guaranteed steady work would be better for both miner and operator. The wide fluctuation

exception of Ohio for two months past. The publication of the table has been postponed for that time by delay in obtaining the official statement for the important State of Ohio, which was not finally furnished until a few days ago. The tables are made up from the official figures of the mine inspectors and other State authorities and direct returns from producers, and are, we believe, accurate.

Perhaps the most notable fact shown by the table is the relatively small change in the total production as compared with 1895. The last-named year was one in which there was very considerable—though rather spasmodic—activity in the iron trade and some other branches of manufacture, while 1896 was a year of continued and almost uniform depression; but there was last year a decrease of only 1½ per cent. in the production. Moreover, this was entirely in anthracite coal, the output of bituminous coal, the fuel of manufacturing, being almost the same in 1896 as in 1895. The change was an increase of 244,702 short tons only.

To sum up the table briefly, the total production of coal in the United States in 1896 was 186,241,271 short tons, or 168,957,264 metric tons, of which 137,331,048 short tons were bituminous coal, 48,855,563 short tons anthracite, and 54,660 short tons cannel coal. The total was less than that of 1895 by 2,812,119 short tons, but was greater than that of any year previous to 1895. The value of this coal, or the returns made at the mine, reached a total of \$203,182,972: a sum great in the aggregate, but returning only the small average of \$1.09 per ton to the operators, and the average price of bituminous coal, which alone is to be compared with the coal of other countries, was only 84 cents per short ton, or 92 cents per metric ton.

With the exception of Great Britain the United States is by far the largest producer of coal in the world. At the rate at which production was increasing for the ten years prior to 1893 it was anticipated that in four or five years—at any rate before the year 1900—the lines of output would cross and this country would pass its chief rival. Three years of depression here, and of prosperity abroad, have postponed the time when the United States shall take the lead; but it is still possible that it may come with the end of the century. The difference between the two countries is that Great Britain has reached very nearly the limit of its yearly production, while in this country a very great and rapid expansion is possible whenever demand may justify it. When business revives here, an addition of 10,000,000, or even 15,000,000 tons to our output in a year would not be impossible, nor even extraordinary. The fact that the change last year was so small again brings us to the conclusion that trade depression is marked less by an actual decrease in production than by an absence of the normal growth of ordinary times, and by a reduction in profits.

The table shows that our supply of fuel in this country is cheap as well as abundant. As noted above, the average return per ton at mine last year was \$1.09, but this was brought up by the higher prices of anthracite. The average for all bituminous coal at mine was 84 cents, and this was above the amount reported for several of the States. Thus, among the important producers we find that Pennsylvania bituminous brought an average of 66 cents only; West Virginia, 70 cents; Illinois, 72 cents, and Ohio 78 cents. No State east of the Mississippi shows an average as high as \$1 per ton. In contrast with the general tendency anthracite showed a higher average in 1896 than in the previous year—\$1.80 against \$1.50—which was due entirely to the action of the companies controlling the trade in restricting production and maintaining prices.

Pennsylvania is the greatest coal-producing State, furnishing last year 36.6 per cent. of the bituminous coal, and 53.1 per cent. of the total, including the anthracite. Illinois holds the second rank, though its total output is only one-fifth of that of Pennsylvania. Ohio comes third and West Virginia fourth. It is to be noted that the Ohio production showed a considerable decrease in 1896, while West Virginia not only held its own but made a slight gain. No other State outside of these four reports a yearly total over 5,000,000 tons, with the exception of Alabama.

To some extent the varying currents of trade can be traced in the production of the different States. The decrease in Pennsylvania bituminous is more than accounted for by the smaller amount taken for conversion into coke for the iron trade. The condition of that trade may partly account also for the decrease in Ohio, though very little coke is made in Ohio; but in part also that was due to a loss in the Lake trade through the competition of the Pittsburg region, and to a lesser extent, of West Virginia. Coal from the last-named State now reaches the Lakes and finds markets as far west as Chicago, notwithstanding the longer haul required, its advantage in quality over the Indiana and other Western coals being generally recognized. West Virginia, indeed, is a disturbing factor in both the Western and the seaboard coal trades; its low mining costs and the character of its coal, together with the central position of the State and its railroad connections, enable the operators to cover almost the entire territory from the Atlantic ports to Chicago at will.

In the Southern States the production was maintained about on the same level as in the preceding year, Kentucky and Tennessee showing little change, while Alabama reports an increase. The production of the other States is not important. The Alabama operators no longer depend so entirely on the iron trade as formerly. They have extended their shipments to the Gulf ports and are beginning to take a share of the Mississippi River trade, which was formerly an exclusive field of the Pittsburg people.

Some of the Western States show unexpected changes. While there was a small decrease in Indiana's production last year, Iowa, Missouri and Kansas changed very little, and Illinois reported an increase of 2,050,762 tons, or much more than any other producing district. It is not easy to account for so great a gain, though it was probably due in part actually to the trade depression and general tendency to economize, which forced the extended use of the local coal in Chicago and other cities in place of the more expensive anthracite, which there finds a considerable sale for domestic use in ordinary times. Very little Illinois coal goes out of the

State except to Wisconsin, on the north, and to the city of St. Louis. The adjoining States to the east and west are coal producers themselves, and the quality of the coal is not such as to permit it to compete in more distant markets.

In the Rocky Mountain region Montana and Wyoming showed gains in 1896 and Colorado a decrease, but none of the changes were of importance. On the Pacific Coast Washington showed a larger production in 1896, but the output of Oregon and California continued small. The reliance is still largely on British Columbia and other foreign mines.

The coal production of the United States is very nearly the measure of its consumption, both imports and exports being small. In 1896 the former, chiefly at the California ports, reached a total of 1,349,557 tons, while the exports, which nearly all went to Canada, were 3,626,202 tons. The difference of 2,276,645 tons was only 1.2 per cent. of the total production. Notwithstanding our cheap and abundant coal and ready transportation to deep water, our coal exports do not increase. Outside of the shipments to Canada, which are made chiefly by rail or by the Lakes, our export trade is made up chiefly of a few cargoes yearly to the West Indies and South American ports. Coal can probably be put on board ship more cheaply at Norfolk, Newport News, Pensacola, Mobile, Philadelphia, Baltimore or New York than at any ports in Great Britain; but that country still continues to supply customers with coal all over the world, while our trade is comparatively nothing.

The anthracite production, which was carried up to the highest point ever known in 1895, showed last year a decrease of 5.9 per cent. Experience had taught the producers that remunerative prices could not possibly be maintained with unrestricted production, and an opposite policy was adopted, an informal agreement being generally observed by the companies.

The coke production of the United States is shown in the second table, by States. As compared with 1895, there was a decrease in production of 17 per cent. The coke trade is so closely allied to the iron industry, and so dependent upon the demand from that industry, that a decrease was to be expected. Nevertheless, there was an increase in the average price, chiefly because of the persistence with which the producers who control the Connellsville region maintained their schedule.

Pennsylvania continues to be the chief coke producer, furnishing about two-thirds of the total and nearly all the decrease in production was in this State. There are already indications of approaching exhaustion of the coal deposits in the Southwestern part of the State, from which the Connellsville coke is made, and some of the large operators of that district have already been buying property in West Virginia; and that State may in time become the leading coke producer.

The year 1896 was one of sharp competition, low prices and unsatisfactory results to coal operators and miners all over the country. That it was not a year of serious labor troubles also was due to the apparent hopelessness of strikes probably more than to any other cause. Production was not interfered with by any cause except the decrease in demand. That there were no greater changes than those shown in our tables must be considered as the most notable incident of the year.

NEW PUBLICATIONS.

BRITISH COLUMBIA DIRECTORY OF MINES. Corrected Quarterly. Edited by Alexander Beggs. Vancouver, B. C.; *The Mining Record*. Pamphlet, pages 124. Price 50 cents.

This convenient publication gives a list of the mines of British Columbia arranged by districts and accompanied by brief notes on the nature of the claim and such other particulars as are attainable. It has also a list of the companies incorporated in the Province, with their capital stocks, officers and location. Other information given includes transportation, express and telegraph lines, government officers and other particulars of use to the resident and the newcomer or visitor. The present issue includes a summary of the mining laws of the Province, with full explanations. This has been brought quite up to date, including for the first time all the amendments adopted and changes made by the legislature at its recent session. This is an important point as the prospector and the mine-owner want to understand the exact condition of the law at the present time; and it is fully given in this handy little book.

THE AERONAUTICAL ANNUAL: 1897. Edited by James Means. Boston; W. B. Clarke & Company, and London; William Wesley & Son. Pages, 178; illustrated. Price, \$1.

It is only within a few years that a publication of this kind has become really possible. From ancient times the man who attempted to navigate the air had been a subject of derision, and at best was held to be impracticable and visionary. It was not until a short time ago that the question was taken up by competent men and artificial flight was shown to be scientifically possible. For many years men have risen into the air by the aid of balloons and similar appliances, and a great amount of labor and inventive skill has been expended in the hope of constructing some machine of this kind which might be manageable and so navigate the air as a ship does the water. This attempt has now been practically abandoned as hopeless, and it is not at all probable that the balloon will ever be more than a toy on a large scale, or useful only for a limited range of purposes, where it can be controlled by some rope or similar connection with the earth. The real aeronauts—the balloon builders—have ceased to be considered as an element in the solution of the problem.

The new school is that of the aviators, who believe that success is to be

found in the scientific study and imitation of the flight of birds, and to them is due such measure of success as has been thus far attained. It was easy enough to deride the first beginnings of this school; but it is not so easy now when it is headed by men like Langley, Chanute and Maxim—the trained scientist, the able and experienced engineer and the mechanic of proved ability. These men and others who are aiding them have shown their capacity in different lines; they can give good grounds for their faith and they take no step without sufficient reasons. Otto Lilienthal—a mechanical engineer of great ability—in Germany was the first to accomplish actual flight and to prove that properly designed aeroplanes, which may be likened to artificial wings, would sustain a man and carry him through the air in such direction as he desired to go, with little more attention to the wind currents than must be paid in a sail-boat. Unfortunately, Herr Lilienthal died last year, and his experiments have been discontinued. To soar through the air for half a mile is to have accomplished a great deal, since it proves the possibility of sustained flight. Working in this country on slightly different lines, Professor Langley has designed his aerodrome, which has in it some of the elements of success, and Octave Chanute has completed his gliding machine, with which even more has been accomplished in actual flight through the air than Lilienthal achieved. Mr. Maxim's efforts have been largely in the direction of designing a motor which shall be strong enough and light enough to operate his aeroplanes. The efforts of these leaders have been aided by A. M. Herring, E. C. Huffaker, Karl Müllenhoff, Professor Zahn and others. What they accomplished in the past year is well described in the *Annual*.

The degree of success so far attained, though limited, is sufficient to show the possibility of actual flight through the air, and to point out the way to be followed, which, in time, may lead us to the complete solution of the problem.

BOOKS RECEIVED.

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

Avicultura Practica. Apuntes Sobre el Origen de las aves de Corral. R. de Zayas Enriquez. Mexico City, Mexico; State Printing Office, 1897. Pages, 140.

A Treatise on Arches. By Malverd A. Howe. New York; John Wiley & Sons. London, Eng.; Chapman & Hall, Limited. 1897. Pages, 351; illustrated. Price, \$4.

The Stamp Milling of Gold Ores. By T. A. Rickard. New York and London; The Scientific Publishing Company. Pages, 260; illustrated. Price, \$2.50.

The Chlorination Process. By E. B. Wilson. New York; John Wiley & Sons. London, Eng.; Chapman & Hall, Limited. 1897. Pages, 123; illustrated. Price, \$1.50.

Krupp's Gussstahlfabrik. Von Prof. Dr. Friedrich C. G. Müller. Illustriert Von Felix Schmidt and A. Montan. Düsseldorf, Germany; August Bagel. Pages, 170; illustrated.

Le Mecanisme du Lit Fluvial. Par V. Lokhtine. Traduit par A. M. Danzig. St. Petersburg, Russia; Bureau Technique International, 1897. Pages, 67; with tables and diagrams.

CORRESPONDENCE.

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

The Bingham Copper Placers in Utah.

Sir: Having read in your issue of May 29th a letter from your special correspondent on the copper existing in some of the placer ground in Bingham Canyon, Utah, and having examined the matter in 1874, I submit the following remarks on these deposits. At that time metallic copper had not been found in the upper part of the canyon above a certain point about a half a mile from the tower. At this point the canyon passes out of the stratified rocks, quartzites and shales, through a large mass of porphyry, the whole side of the mountain east of the creek consisting of that rock for over 300 ft. Further up the canyon passes again through stratified rocks, the copper being found altogether below this outcrop of porphyry. Portions of this outcrop contain numerous small veins and threads of quartz carrying various copper sulphides in small quantities. The largest of these veins was at one time worked as a copper mine and produced fine specimens of copper glance. My opinion is that these sulphides by the action of air and moisture have been converted into cupric sulphate to a certain extent and carried down through the rock by means of rain and the water from melting snow to reappear in the form of minute springs at the base of the mountain where the rock formation disappears under the gravel of the creek. The water issuing from some of the springs is at the low-water season quite green, and although small in quantity is ample to account for the copper found in the gravel, granting the long period of time during which this operation has been in progress. The supply of copper in solution being recognized, its deposition is a simple chemical proposition, as the following facts will show: Just below these small springs there is or was a large bank of decomposed vegetable matter, like a small peat bog, the gravel for some distance being much mixed with this material, and as it is well known that vegetable substances precipitate copper from their solutions, there can be no doubt that the peat or cottonwood was the reagent that separated the metallic copper.

On the score of quantity it must be evident that the period of time necessary for the formation of so large a quantity of vegetable matter as is contained in the bog would also be ample to supply an immense quantity of copper from the existing springs referred to. Much of the copper obtained is highly crystalline and sparkling, indicating a deposition in accordance with the existing conditions of slow action and dilute solutions.

There is another instance of a similar, though much smaller, deposition of copper in the canyon leading from Butte to the Park on the line of the

Montana Central Railroad, but it was found in smaller pieces and not so beautiful as the Bingham specimens. JOHN LONGMAID. BOURNE, Ore., June 9, 1897.

Ancient Mining in Rhodesia.

Sir: Mining has probably been carried on in Rhodesia at different periods for hundreds if not thousands of years. Whether the miners were white or black it is impossible to say, but, judging by the ruins of what appear to have been ancient cities and the way in which the mines have been worked in different parts of the country, it seems almost certain the people who inhabited these cities were an intelligent race and that the labor upon the mines was performed by slaves. That the people who worked the mines were acquainted with mining seems a certainty from the systematic way in which it was done, and that there was more than one race engaged in mining is shown by the different systems that were followed in the different districts. In the vicinity of Bulawayo, and, in fact, for a great many miles around, the system adopted, so far as I am able to judge, was that slaves were sent out all over the country where rocks of the slate kind occurred to gather into heaps the small pieces of float quartz which were found scattered over the surface, also to note any outcrops of quartz reefs. These heaps of float quartz and quartz outcrops were examined by men acquainted with metals and minerals for visible gold. Upon the discovery of a reef by them containing the desired metal a small hole was made at the point of discovery, some of the reef taken out and tested; this was done by putting some of the quartz into mortars, made by making a hole about 6 in. deep in a hard rock, crushing it with a piece of diorite rock of an oval shape and panning it in a wooden vessel. When they became satisfied that a reef would pay them to mine they took out the quartz along the reef until it ceased to contain any visible gold, after which they mined the reef down to water-level. The quartz taken from the mine was placed in heaps upon the surface, broken into very small pieces and sorted; that which contained visible gold was saved for crushing and the remainder left at the mine. That this is nearly correct is evident from the fact that large quantities of quartz containing no visible gold still remain near these ancient mines, and it is sometimes very rich in gold.

The mining was performed by making narrow cuttings alongside of the reefs in the soft slaty walls with some sharp tools, leaving the reefs exposed, then the quartz would be hammered off with pieces of hard basaltic rock, which are found in great numbers near the mines with fingermarks upon them. If the quartz was very hard, a fire was built against the reef and water thrown upon the quartz when heated; this would have the effect of fracturing the quartz so that it would scale off when hammered. The quartz was probably carried to the surface in bags made of animal hides, the surface being reached by primitive ladders made of small trees with parts of the branches left for footholds, which were placed at the ends of the open stopes in the mines. Similar methods may be seen in operation at the present day in some of the remote parts of Mexico.

As to who the people were who did the mining I am unable to form an opinion, but I am satisfied that the slaves who performed the actual labor were the natives of this country, and to bear me out upon this point I have investigated the habits of some of the descendants of the people who inhabited this country previous to the incoming of the Matabele. These people are still very numerous in the country; at the present day they mine and smelt iron ore and manufacture all kinds of implements for their own use and for sale to the Matabele. In and around the Selukwe District the system of mining was apparently different. There very little sorting has taken place and very much lower-grade ores have been worked than in the Bulawayo District, while the whole of the quartz mined has usually been removed. In this district also large numbers of furnaces made of pottery exist that have the appearance of having been used for the purpose of sharpening tools. The ancient mines here appear to be far more numerous and more extensively worked than in the Bulawayo District, and large white quartz reefs show that the ancients have prospected them for miles without obtaining any gold, while the same kind of reefs near Bulawayo show no signs of ever having been touched.

These ancient mines are very numerous in this country, and in the majority of instances contain quartz sufficiently rich in gold to pay the white man to mine at the present time; but there are a few points upon which great care must be taken to determine the quantity of ore that may exist. This is one of the most important points in mining in this country. In many instances the reefs contain only very small streaks of ore upon the walls (generally the hanging-wall), and this streak of ore although of good quality is often so small that it will be impossible to mine it at a profit. Another point is in determining the length of ore-body existing upon any one of these claims, as in many instances they are only a few feet in length, forming merely a small pocket. Unscrupulous men have taken advantage of this class of claim and have sunk shafts so as to expose the ore body at its richest point, deceiving the public by quoting the results obtained at the bottom of the shaft as an average of the whole reef. Many of these ancient mines contain large reefs and long ore bodies, and the ore is generally of a very fair grade. In the majority of instances, if they are carefully managed, they should prove dividend-paying mines.

Another point that must be taken into consideration in connection with these ancient mines is their proximity to water, for although most of the districts are well watered, there are a few localities where there will be great difficulty in obtaining water to work them. Some of the ancient mines that have been opened up successfully have proved rich in gold. I may say that in a long experience I have never seen a country containing so many mines from which so many rich specimens have been obtained. GEO. JENKINS. BULAWAYO, April 10, 1897.

Railroads in China.—The contract for building a railroad from Paoting-Fu to Han-Kau in China has been let to a Belgian syndicate, by Sheng-Fu-Jen, the Chinese director-general of railroads. This syndicate is to provide \$20,000,000 as a 4% loan to the Imperial government, and the latter will advance 13,000,000 taels. A part of the material is to be bought in China.

BARNY BARNATO.

Despatches from Funchal, Madeira, by way of London, announce that Barney Barnato committed suicide by jumping from the steamer on which he was traveling from South Africa to England on June 14th. It appears that he jumped overboard after the steamer had reached Funchal, although a man was watching him at the time and was close at hand.

Very little is known of his early life, and all sorts of stories were told about him, but he never saw fit to give his true history. There seems to be little doubt that he was born in London of Jewish parents, that his name was originally Isaacs, and that he grew up with little or no education. When little more than a boy he went to South Africa with a brother, and for a time his career there is also unknown. It is said that he acted in a circus and made a living as a juggler, but this is also uncertain. At any rate he worked his way finally up into the diamond region about Kimberly, and there gathered together money enough--it is hinted, as an illicit buyer of precious stones--to pay his fees and become a regularly licensed diamond buyer. Profits on stones did not content him however, and he soon became a heavy speculator in mines. It is said that he first accidentally discovered the value of the blue ground from which most of the diamonds are now obtained. This, like all other assertions about him, is not at all certain, but he acquired possession of a large number of claims which were either abandoned or sold very cheaply by their original owners. For a time he held these as a means of fighting Cecil Rhodes and his associates, but finally came to terms and joined with Mr. Rhodes in organizing the De Beers Consolidated Company, which now controls the diamond business of the world.

So shrewd a man as Barnato was not likely to neglect the opportunities offered by the discoveries of gold on the Witwatersrand, and early in the history of Johannesburg he was a resident and a large owner of mining claims. He organized a number of companies of which he retained control, and in due time brought them to London. From that time on his name has been identified with the Transvaal boom. Very shrewdly again, he succeeded in securing the friendship of Sir Edgar Vincent, a great authority in London financial circles, and with his aid the great boom was fairly launched. The name of Vincent also was of great assistance to him in Paris; financiers there recognized Sir Edgar's great services in the adjustment of the Turkish debt and other important transactions of the higher finance and his introduction was the start that he needed.

With the rise and culmination of the boom our readers are familiar, and the events themselves are so recent that they need not be repeated here. At its height Barney Barnato was called the richest man in England, and his fortune was estimated at from \$100,000,000 to \$150,000,000. Of course this was in paper and could never have been realized in cash. Nevertheless his wealth was very great, and more than Cecil Rhodes even, he was the London hero. With the culmination of the boom and when stocks began to fall, his losses were very large. Besides the actual depreciation in the values of shares, he is said to have spent large sums in trying to sustain the market at different times. Recent estimates of his estate put the present total at \$15,000,000, which is very probably an exaggerated figure. He did, however, acquire some landed and other property in England outside of his speculative holdings, and this remains for his heirs. His house in London is said to have cost \$1,000,000.

At one time he was the center of attraction in London, and persons of the highest rank, socially and financially paid court to him. Wonderful stories were told of his extravagances--probably not much nearer the truth than such stories usually are. His career recalled--with exaggerations--that of George Hudson, the head of the great railroad boom in England nearly 50 years ago.

He married in South Africa; his wife survives him, with three children, all young. Personally he was not an attractive man in appearance, but he was a good talker, with great persuasive powers, in spite of his lack of education. He was certainly a man of much natural ability.

After the collapse of the boom in London Mr. Barnato lost some of the prestige and popularity which he had enjoyed. The excitement of his position and extravagant living told upon him, and for some months past there have been reports that he was mentally unbalanced. At the time of his death he was returning to London from a long stay at Johannesburg, and it is said that on the steamer he was never left alone.

An Exhibit of Sardinian Mines.—L'Associazione Mineraria Sarda is reported to be taking steps to organize a representative exhibit at the Turin Exhibition, to be held next year, of the mineral products of Sardinia and of the mining appliances used on that island.

THE GENESIS OF THE GOLD ORES IN THE CENTRAL SLATE BELT OF THE CAROLINAS.

Written for the Engineering and Mining Journal by H. B. C. Nitz.

One of the principal belts of gold-bearing rocks in the Southern Atlantic States is the great zone of metamorphic schists and slates, from 8 to 40 miles in width and 200 miles in length, extending from the Virginia line in a general southwesterly direction through the central portion of North Carolina into the northern part of South Carolina. This is the so-called "Carolina Slate Belt." It includes in North Carolina portions of the counties of Granville, Person, Durham, Orange, Alamance, Chatham, Randolph, Davidson, Rowan, Moore, Montgomery, Stanly, Cabarrus, Anson and Union, and in South Carolina the counties of Chesterfield and Lancaster. Among some of the well-known mines situated in this area are, in North Carolina, the Burns, Hoover Hill, Silver Hill, Silver Valley, Conrad Hill, Russell, Steel, Sam Christian, Gold Hill, Bonnie Belle and Howie, and in South Carolina the Brewer and the Haile.

The country rocks are: 1. Metamorphosed argillaceous, sericitic and chloritic slates and schists; 2. Devitrified ancient volcanics (rhyolite, quartz-porphry, breccia, etc.); 3. Sedimentary clay slates.

The argillaceous and sericitic (or hydro-micaceous) slates and schists are perhaps the predominant types. They are usually highly sheared, but show obscure evidences of a primary sedimentary origin, although they are non-fossiliferous, so far as present investigations have gone. They are generally silicified, and sometimes to such an extent that silica

practically replaces all of the other constituents. The chloritic schists are more crystalline, and they probably represent sheared basic eruptives. The general strike of the schistosity is N. 20°-55° E., and the dip varies from 55° to 85° N. W.

The volcanic rocks occupy irregular and disconnected areas along the eastern border of the belt. They comprise both basic and acid types. The latter, which apparently predominate, are chiefly rhyolites and quartz porphyries, though their true character is greatly obscured by devitrification and silicification, and they appear more like chert or flint to the naked eye. They are largely sheared into schists, and some of the silicified schists of the first class may in fact belong here. The basic types are probably pyroxenic in composition, and are usually schistose in structure. The breccias consist of angular fragments of the acid rocks imbedded in a basic matrix.

The sedimentary clay slates are known as the Monroe slates from their typical development in and near the town of Monroe in Union County, N. C. They are but slightly indurated clay slates, lying in nearly flat and gently undulating beds. They cover considerable though isolated areas, chiefly among the volcanic series, to the north and east of Monroe, in Union, Stanly and Montgomery counties, and dip under the Jurassic Trias conglomerates 20 miles east of Monroe. No fossils have as yet been found in these slates. The age classification of these rocks must for the present be provisional. The metamorphic schists and slates are placed in the Algonkian; the volcanic rocks are

believed to be pre-Cambrian; and the Monroe slates must, from the absence of fossils, for the time being, be also placed in the Algonkian. Diabase dikes are of common occurrence throughout the whole region. They strike usually in a northwesterly direction across the schistosity of the country.

The study of the genesis of the gold ore deposits occurring in this region involves a consideration of: 1. The structure of the deposits; 2. The causes of the formation of the spaces occupied by the deposits; 3. The manner of filling these spaces.

1. *The Structure of the Deposits.*—The gold ore deposits exist in two principal structural forms, as quartz fissure veins, and as impregnations in the country schists and slates.

The quartz fissure veins lie apparently interlaminated with the schists, and are more or less lenticular in shape, having irregular boundaries, and swelling and pinching at intervals. Although they do in general conform to the schistosity of the enclosing country, a careful examination will usually reveal that they often intersect the schistose planes at very small angles. Furthermore, clean cut veinlets of quartz and calcite occur, distinctly intersecting the cleavage and schistosity of the country, and the steeply inclined quartz fissures in the nearly horizontally bedded Monroe slates furnish further evidence of the fissured character of the veins. Isolated instances of fissures crossing the strike of the schistosity are met with, but they are rare. The country rock adjacent to these ore bodies is usually impregnated for some distance from the veins with auriferous sulphurets.

The second type of ore deposits is that of irregular and finely divided



BARNEY BARNATO.

disseminations of auriferous sulphurets and fine gold, accompanied by small stringers and lenses of quartz, in the country schists and slates, which latter are usually silicified in varying degrees. They bear some resemblance to the Scandinavian "fahlbands." In shape, these auriferous schist bodies are lenticular; their outline, however, does not necessarily conform with the strike and dip of the schists, but is determined rather by the extent of impregnation. In width they vary from a few feet to several hundred. The character of the mineralization of the quartz veins and the "fahlbands" is very much the same. The gold occurs in the free state and in combination with sulphurets. The latter are chiefly pyrites; galena, zincblende, and rarely mispickel, occur in certain localities, notably at the Silver Valley and the Silver Hill mines in Davidson County, N. C. At times the veinstone is mineralized with chalcopryrite to such an extent as to make a copper ore, but in these cases too the ore is auriferous and valuable for its gold contents. The galenas and zincblendes usually carry silver. The precious metals are not uniformly distributed throughout the ore-bodies. In both the quartz veins and in the "fahlbands" they are more or less concentrated in shoots or chimneys which have a pitch of their own on the line of strike.

2. *The Causes of the Formation of the Spaces Occupied by the Ore Deposits.*—The slates and schists are everywhere secondarily cleaved and sheared, the usual strike being N. 20°-55° E., and the dip steeply to the northwest. Observations show that the resultant dynamic force, which induced this structure, acted as a rule from the northwest downward, developing normal faulting, with but slight compression. These dislocations on larger and smaller scales produced the spaces of dissection which were afterward filled with the ore-bearing solutions. That this fissuring force was subsequent to the force which produced the original schistosity is plainly evident from the fact that in every instance fragments of the schistose country rock are found included in the quartz. The larger and more distinct fissures were opened along maximum lines of faulting in planes of little and unequal resistance. Where the tension, compression, resistance, etc., were more uniform the effect was more like a general shattering of innumerable small fissure openings, which determined the formation of the auriferous schist bodies, so that these may really be looked upon as an aggregation of numberless minute fissure veins.

The strike and dip of all of these veins conform approximately to the strike and dip of the original schistosity of the country rock. And it is perfectly natural that such should be the case, for it is reasonable to suppose that in such material as these slates and schists are composed of the chief yielding planes, the planes of least resistance, should have been in parallel directions to the cleavage. A still later fissuring force, and one of greater magnitude, took place when the openings now occupied by the diabase dikes, but unaccompanied by metallic mineral contents of any consequence, were formed. These fissures intersect the strike of the country and of the ore fissures nearly at right angles. They are usually of considerable width, from a few feet to as much as 150 ft.

3. *The Manner of Filling the Fissure Openings.*—No instances of a metasomatic formation of the ores has been observed in the area under consideration. The most reasonable theory to accept for the manner of filling of the spaces of dissection, is that of the ascension of mineral bearing waters from below. And the origin of these deep-seated waters is connected with the last stages of the volcanic activity that was general along this line of disturbance, the so-called solfataric and fumarole stages.

Heated carbonated alkaline waters are capable of taking silica and metallic elements and sulphides into solution. Such waters, perhaps in a very dilute condition, ascended and circulated through the open fissures and spaces, and deposited their mineral contents on the walls, by virtue of relief of pressure, reduction of temperature and perhaps of certain chemical reactions. The frequent silicification of the slates and schists has been noted, and must be ascribed to this permeation by silicified waters. Mr. Geo. F. Becker, of the United States Geological Survey, who accompanied me on one of my late trips through this region, supposed, very reasonably, that there might be some connection between the fact of this silicification and the richness of the ores, i. e., that the highly silicified schists might be also more highly charged with metallic contents. Close examination into this, however, has shown us that they are not necessarily richer than the softer varieties, when such are impregnated with xenogenous minerals.

It seems probable that the main silicification went on independently, either at the same time with the deposition of metallic minerals or subsequently; it was probably more of a chemical than a mechanical action. Certain portions of the original country rock may have been so composed chemically as to have permitted of partial replacement by silicic acid, while others did not. In two instances (at the Burns and the Howie mines in North Carolina) was free gold found directly in the soft sericitic schist, which was apparently entirely unsilicified and free from quartz. However, the absence of quartz or silicification in even an incipient stage cannot be regarded as favorable to the metallic richness of the ore bodies.

The diabase dikes which occur in this region appear in general to have exercised a notably favorable influence on the richness of the ore-bodies. The ores are often richer in the vicinity of the dikes. At the Haile mine in Lancaster County, S. C., this is particularly marked. Presumably the formation of these dike fissures has stimulated and intensified the circulation of the mineral-bearing waters below, and it is even probable that these waters may have derived part of their metallic contents from the diabasic magma, which is often slightly pyritic, and has, in one case at least, been found to contain free gold.*

The impregnation of small isolated crystals up to $\frac{1}{4}$ in. cube, or of fine crystalline aggregates of sulphurets, usually pyrite, in the soft, unsilicified rock, within the limits of the ore zones and veins, and at a distance from the same, still remains to be explained. One explanation would be that the mineral solutions percolated through minute, pre-existing pores in the country rock in which they deposited their contents. Or their presence might be accounted for by a metasomatic change or replacement, such as suggested by Becker for the genesis of pyritic impregnations in the altered rocks of the Comstock lode in Nevada, by the action

of hydro-sulphuric acid solutions or ferruginous bisilicates.* The presence of free gold in the soft slates at the Burns and Howie mines, above alluded to, might be explained as a residuum from such auriferous pyrites the iron sulphide having been oxidized and leached out.

Mr. Becker has pointed out the tendency to successive deposition from solutions reaching complete saturation for separate minerals at different points in space.† This explanation may be applicable to the local deposition of free gold, unaccompanied by quartz or pyrite, such as is seen in the fine coatings on the cleavage planes of the unaltered slates at the Howie mine.

As a rule the richer ore bodies exist as shoots or chimneys, which have a pitch of their own in the vein, and which must represent the main course of maximum circulation. The position of these shoots may bear some direct relation to the laws of fissuring.

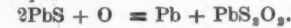
The Age of the Ore-Deposits.—As shown above, the fracturing force which produced the fissures, and hence necessarily the filling of the spaces, took place subsequently to the force producing schistosity. The Carolina Slate Belt is bounded on the east by the basal conglomerates of the Jura-Trias formation. Investigations have shown that these conglomerates contain gold. The origin of the gold must therefore be pre-Jura-Triassic. The presence of gold-bearing fissure veins in the Monroe slates proves that their age must be post-Algonkian or possibly late Algonkian, and the existence of ore bodies in the pre-Cambrian volcanic rocks furnishes additional ground for this statement.

THE REACTION BETWEEN LEAD AND THE OXIDES OF SULPHUR.

By Henry C. Jenkins and Ernest A. Smith.

In this paper, read recently before the Chemical Society in London, the authors draw attention to the fact that when molten lead is exposed, at high temperature, to the action of a current of sulphur dioxide both lead sulphide and lead oxide are found in the product. The paper is the account of a research undertaken with a view to ascertain the precise reaction which takes place under these conditions as well as to see whether it did not account for some anomalies that are met with whenever a full explanation of the chemistry of lead smelting in the reverberatory furnace has been attempted.

Mr. Hannay had sought to explain these anomalies by the assumption that a volatile body, Pb_2O , had been formed. He based the evidence for the existence of this body, that could not be isolated, on the observation that in some experiments he had conducted by passing air over heated galena he obtained only one-half of the lead in the metallic state according to an equation:



The authors on repeating this experiment with air and with oxygen find that the amount of lead that is volatilized in such an operation does not bear any definite ratio to the total amount of lead present, but can be made to vary greatly, and is entirely dependent upon the velocity of the current of air supplied. They, therefore, submit that there is now no evidence of any such reaction, the ratio found by Mr. Hannay being the result of some accidental coincidence of experimental conditions.

In continuing the research it was found that on heating a mixture of lead sulphide and lead sulphate in a vacuum a reaction occurred, having sulphur dioxide as one of the products; also that the amount of residual lead sulphide and oxide was dependent on the duration of the experiment as well as on the temperature. They then proceeded to test separately the pairs of bodies supposed to be present, with a view to discover whether secondary or reversed reactions occurred.

On heating lead with lead sulphate they always obtained lead sulphide in the product in amounts varying with the temperature of the experiment and the length of time that it occupied. On heating together lead and sulphur dioxide they found that at moderately elevated temperatures (300° to 400° C.) lead sulphide and sulphuric anhydride are formed in each other's presence, and that this leads to the formation first of lead oxide and then of lead sulphate.

The action is represented more or less completely by the equations: $Pb + 3SO_2 = PbS + 2SO_3$; $Pb + 2SO_2 = PbSO_4 + SO_2$; or, more simply, $2Pb + 2SO_2 = PbS + PbSO_4$. The main condition determining the relative amounts of the products is the temperature at which the experiment is performed. The last of these equations occurring in the presence of excess of sulphur dioxide is the exact inverse of one of the main reactions of lead smelting as stated by Dr. Percy; in that reaction a supply of air is required to sweep away the sulphur dioxide as soon as it is liberated. It is submitted that as the new equations quite account for the anomalies to which attention has been drawn, there is now no reason whatever to doubt that the reactions given by Dr. Percy, $Pb + PbSO_4 = 2PbO + SO_2$; $PbS + PbSO_4 = 2Pb + 2SO_2$, as well as $PbS + 2PbO = 3Pb + SO_2$, do actually occur and form the basis of the metallurgy of lead.

A Russian Factory.—The Briansk Company, of Ekaterineslav, Russia has just issued its report for last year. It shows a profit of 3,523 583 roubles, which admits of a dividend of 32%. The production of the works last year comprised 142 locomotives, as compared with 118 in 1895, 1,708 railway cars, as against 1,500, and 67,813 metric tons of rails as against 63,390 tons.

Boring for Coal in Essex, England.—The Eastern Counties Coal Boring and Development Association, Limited, proposes to commence boring for coal upon the estate of Mr. E. A. Wedd, of Great Wakering, Essex, says the *London Iron and Steel Trades Journal*. A provisional agreement has been entered into with Mr. Wedd, which gives the association rights over 1,300 acres, and secures to the company one-half the profits arising from the working or sale of coal for 30 years from the date of the agreement.

* *Ores of North Carolina*, Raleigh, 1887. Appendix B. "On some peculiarities in the Occurrence of Gold in North Carolina," by W. C. Kerr, pp. 327-328. Also *Transactions American Institute Mining Engineers*, Vol. X., 1882, p. 475.

* *Geology of the Comstock Lode and Washoe District*, by Geo. F. Becker, U. S. Geological Survey. Monograph III., 1892, p. 210.
† U. S. Geological Survey; *Mineral Resources of the United States*, 1892, p. 150.

THE WITWATERSRAND GOLD-FIELD AND ITS WORKING—I.

THE GEOLOGY OF THE GOLD-FIELD.

BY L. DE LAUNAY.

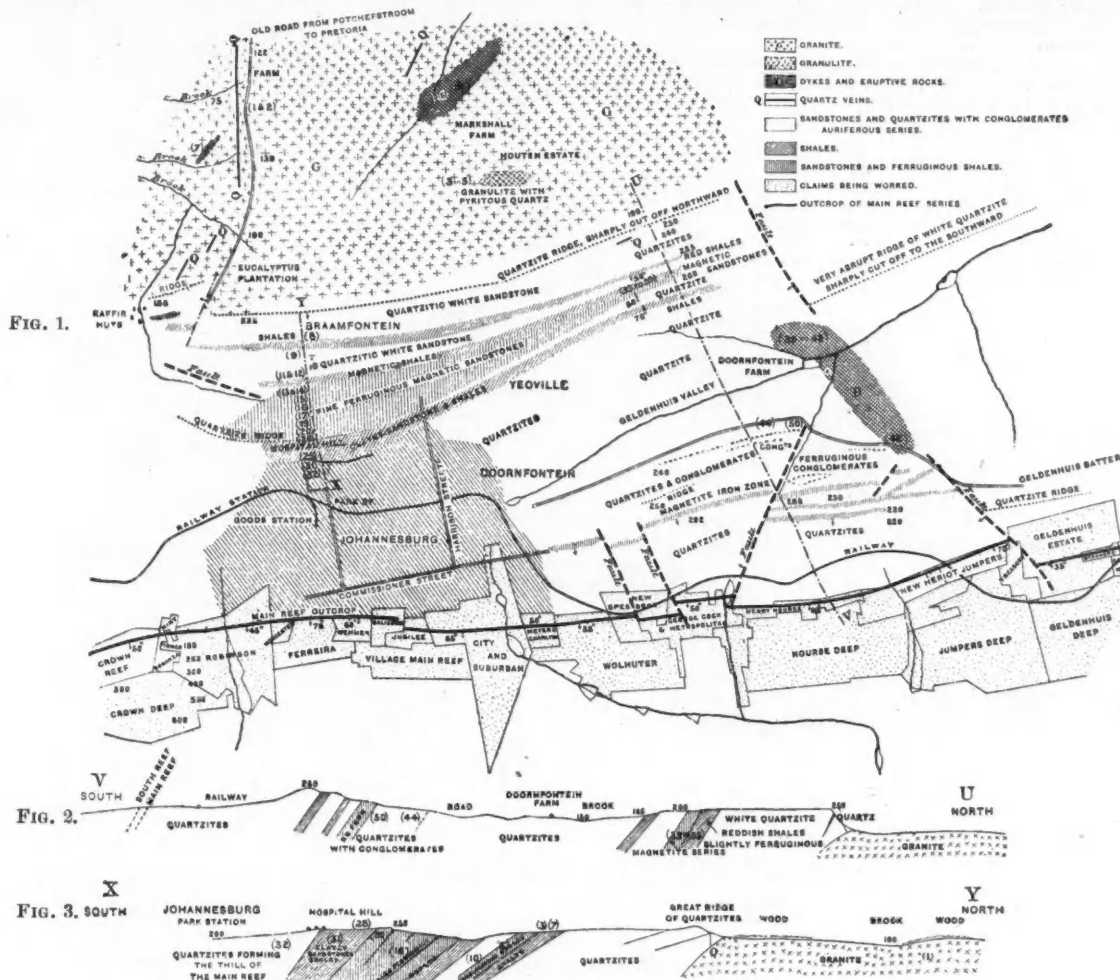
In a summary of his work on the *Gold Mines of the Transvaal* prepared for the Federated Institution of Mining Engineers, M. de Launay says that the gold-fields of the Witwatersrand, including the adjoining districts of Heidelberg and Klerksdorp, have the characteristic feature that instead of containing veins of gold-bearing quartz analogous to those of California or Australia, or of the African fields of Lydenburg, Barberton or Mashonaland, they are formed of gold-bearing conglomerates known as "bankets," of sedimentary origin. This formation has, up to the present time, been observed in these gold-fields only.

The most striking feature of South African geology, taken as a whole, is the existence, overlying a basement of gneiss and granite, of ancient formations—Silurian, Devonian and carboniferous—much folded and corroded. These are unconformably overlain by the great horizontal plateaux of the Karoo, comprising thousands of feet of strata—wherein not a single marine fossil occurs—ranging from the Permian, perhaps even from the upper carboniferous, to the infra-lias. The gold-bearing conglomerates are found in the ancient folded rocks, while the coal beds,

The hard quartzites have resisted erosion when the granite crumbled away, and present sharply broken and jagged outlines. The water system changes with the rocks. In every depression of the granite there are springs and streamlets making marshy meadows and deposits of humus but the quartzites are dry and sterile. From this point as far as the bottom of the synclinal of Springs and Potchefstroom (Figs. 4 and 5) the beds dip continually southward, and the sandstones being fissured and permeable, drain off all the water, carrying it far below the surface towards the Vaal River. No springs are to be found, the *fontains* found in the names of so many of the farms in the Transvaal being merely artificial ponds or reservoirs for the surface water.

The zone of quartzites (Figs. 1 and 3) is about 1,600 ft. thick. Next comes on the two flanks of a small valley, above which rises Hospital Hill, the uppermost point of Johannesburg, a characteristic and important series of shales and fine-grained ferruginous sandstones, all permeated with magnetite.

The section UV, Fig. 2, was taken more to the eastward, near the farm Doornfontein, across the Geldenhuys Valley. In this section the same features are shown, only the thicknesses varying. In the midst of the later quartzites, however, and before coming to the Main Reef, one meets with a zone of slightly auriferous conglomerates—44 to 50 in the drawing—succeeded by another series of ferruginous shales. The granite and gneiss extend a long way east and west from the



GEOLOGICAL SKETCH MAP AND SECTIONS OF THE WITWATERSRAND DISTRICT.

by the help of which it has been possible to work the mines, occur in their immediate neighborhood, in the overlying Karoo formation.

The accompanying sections, Figs. 2 and 3, run north and south and were taken by M. de Launay near Johannesburg. Fig. 1 is a plan corresponding to the sections in Figs. 2 and 3. Going from north to south one finds granite and gneiss, thin quartzite with shales and ferruginous, fine-grained sandstones, followed by another series of quartzites—the Gatsrand series—forming the basin of a synclinal, after which the same beds crop out in the reverse order. These sections furnish a basis for the hypothesis of the arrangement of the gold-bearing conglomerates, in the form of a synclinal striking generally northeast and southwest, which may be extended a long distance in both directions.

One need not go more than 1½ miles north of Johannesburg to find a great mass of granite and gneiss, which extends from that point, striking east and west, parallel with the folds of the area. These plutonic rocks appear, in accordance with a rule which seems to hold good in all countries, in an anticlinal arch of folded ancient sedimentaries. As often happens with the older rocks, the granite is largely masked by superficial drifts, so that it cannot be carefully studied. Veins of granulite occur in the granite; dikes of greenstone are also observed, and quartz veins striking roughly north and south.

After traversing from north to the south the granite—which occupies a broad, gently undulating table-land sloping to the north toward Pretoria—one finds a long, characteristic ridge rising sharply some 300 ft.; this is of fine-grained quartzites, which dip about 50° southward, away from the granite.

point where they are noted above, north of Johannesburg. The map, Fig. 4, shows a great dike of granite running north and south which seems to have uptilted the conglomerate series, and consequently to be of a later date than that series. Finally, to the south, on the other side of a great synclinal of ancient strata, upon which, so far, all the gold workings have been concentrated, the same crystalline rocks are found 12 miles or so east of Heidelberg, and farther westward toward the Vaal, south of Venterskroon. Above the granite comes a series of clay-slates and magnetite-bearing sandstones, with interbedded quartzites.

A curious feature of this series is the banding of red quartz and magnetite, accompanied, according to Goldmann, by titanite. This ferruginous band was characteristic enough to serve as an indicator in the early days of the gold workings to those prospectors who were looking for the Main Reef, which was always the roof of it. The band has been followed to the west up to Krugersdorp, beyond Hartebeestfontein, and as far as Blaauwbank, where it disappears below the Black Reef series. It was also noted at the Zuikerbosch River, where it cuts the valley at right angles; it is again found east of Heidelberg. In short, over the whole area of the Witwatersrand at the base of the ancient sedimentaries, between the granite and the gold-bearing conglomerates, there intervenes a series of ferruginous shales alternating with quartzites identically the same as those that accompany the conglomerates.

Attempts have been made to trace these clay-slates and magnetite-grits over a large area, extending from Cape Colony to Mashonaland.

Following the section southward one comes, above the first series of rocks, to the mass of grits and auriferous conglomerates, the age of

which is still undetermined, owing to the absence of fossils. All the workings are opened in this formation. In a general way the rocks of this formation are almost entirely made up of quartzitic material in the shape of fragments more or less minute, more or less rounded, embedded in a silicious matrix, which is also sometimes pyritous. According to the size of the rolled fragments the quartzites and conglomerates are fine or coarse grained. In these, or more particularly in the conglomerates, at a large number of levels traces of gold have been discovered, and in some of the conglomerates are worked the chief mines.

From north to south—or reckoning stratigraphically from bottom to top—the conglomerate series includes the Rietfontein or Du Preez Reef; the Main Reef group, made up of the North Reef—now seldom worked—the Main Reef Leader and the South Reef; further south the Elsburg or De Paaz Reef; the Bird Reef; the Monarch Reef, unworked; the Kimberley or Battery Reef; finally, the Black Reef, the conditions of deposition or formation of which are quite distinct.

The limestones do not appear at this horizon and the shales only play a subordinated part, though at times they seem to have some relation with the auriferous deposits. The fact that quartz alone is present in the pebbles and gravels of these conglomerates, either in the form of quartz properly so called or in the condition of quartzite which has gone through one stage of sedimentary deposition followed by erosion, simply proves that all these rolled constituents, the evident product of denudation of previously existing rocks, have been subjected to the agencies of mechanical trituration long enough for the destruction of all rocks and minerals less resisting than silica.

The special features of the Witwatersrand gold-bearing series will be discussed in a later article. The descriptions here given relate to the general geological features of the region.

THE MINES OF YAVAPAI COUNTY, ARIZONA.

Written for the Engineering and Mining Journal by John F. Blandy.

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Yavapai County lies near the center of the Territory of Arizona, the major part of the county being in the northwest quarter of the Territory; it has an area of about 8,000 square miles. Nearly all of it is mountainous, there being but two stretches that may be noted as plains. These two are the Chino Valley, with its branches, Williamson Valley and Little Chino, or Lonesome Valley, and the area lying south of the Date Creek Range, extending to the Maricopa and Yuma County lines. The first mentioned, Chino Valley, is especially a grazing district, although small areas of it are under cultivation; the latter section extending from the Hassayampa westward along the Maricopa County line to Yuma County, varies in character, much of the eastern part affording good grass, while the western part is what is called the "cactus plain." The absence of water in it makes it a poor feeding ground for cattle, although there are many patches of it which yield, in season, a good growth of gietta and other grasses. Besides these tracts there are a number of valleys open to cultivation and to a limited extent irrigated, such as the Verde, Agua Fria, Ash Creek, Skull, Peeples, Kirklard, Ferguson and Thompson valleys. As the neighboring mining camps afford a ready market for the products of these valleys, they will always be valuable lands. They are particularly available for orchards and vegetable gardens, the fruits being especially fine in flavor and the orchards very productive. The limited area of cultivable lands insures a steady and high-priced market for the products, as the mining population will continue to grow much more rapidly than the agricultural interests. The registration for 1895

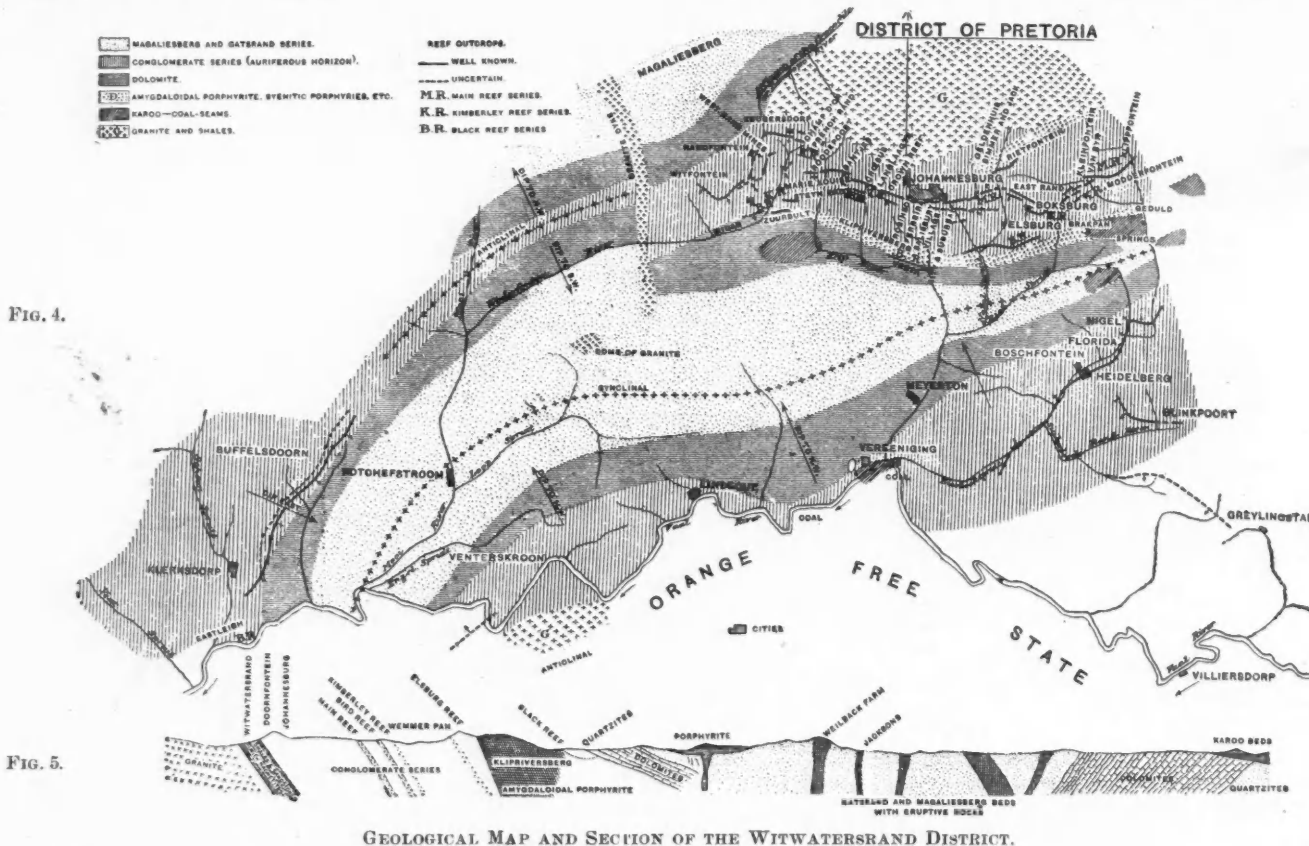


FIG. 4.

FIG. 5.

GEOLOGICAL MAP AND SECTION OF THE WITWATERSRAND DISTRICT.

Reference has been made above to the Karoo formation. This is of importance from the fact that the Karoo beds which are exposed in the Transvaal, Natal and Cape Colony contain in many localities coal deposits of industrial importance. In the Transvaal these are being worked at Vereeniging; near the Wilji River, south of Middelburg; in the Boksburg District at Brakpan, Springs, Cassel and Daggafontein. It was the discovery of these workable deposits near Johannesburg which made the operation of gold mines on a large scale industrially possible. The supply of the Witwatersrand is drawn from the collieries of the Boksburg District almost entirely. They furnish a coal which is not of the best quality, but which gives fair results as a steam fuel and is very easily worked.

New Use for Aluminum.—A new use for aluminum is reported from France, where attempts to construct violins, bass viols and other stringed instruments of this metal have been successful. It is stated that these instruments produce a much richer sound than those manufactured of wood, and that this is especially the case with higher notes.

Railroads in Korea.—Consul-General Sill writes to the State Department from Seoul, April 12th, 1897, that work on the Seoul-Chemulpo road has been begun and is progressing favorably. The concession for this road was granted to James R. Morse, an American, on March 29th, 1896. By the terms of the concession, work had to be begun within one year from the date of the concession, and, in spite of difficulties, this stipulation was fully complied with.

showed that there were 3,405 voters in the county; figuring on the basis of five persons to each voter would give a population of 17,020. Of these 3,405 voters, it may be safely stated that not less than 2,000 are engaged in the mining industry and the balance living indirectly upon that industry. The mining industry is, and always will be, the leading occupation, and the time will come when those employed in it will consume all the food products of the county.

There are four principal mountain ranges traversing the county from north to south, besides several minor and transverse ranges. These four ranges are the Verde, with its extension, the Black Hills; the Sierra Prieta, with its extension, the Bradshaw; the Santa Maria and the Aquarius ranges, the latter being partly in Mohave County. To these may be added the Agua Fria Mountains, Silver Mountains, Weaver, Date Creek and Kendrick mountains.

The Black Hills and the extension of the Verde Range reach a height of 7,500 ft., with an extension of over 6,000 ft. The northern end, or Black Hills, is well set with pine timber. On the Verde, or eastern side, are the United Verde Copper Company's mines and furnaces, with the town of Jerome, a settlement of 1,500 to 2,000 persons, all of whom, directly or indirectly, depend upon these mines. This copper district and deposit has been traced for a distance of four miles to the south of Jerome.

At the distance of 15 miles southward, we come to the gold-mining district of Cherry District, also on the east slope of the range. This district has two gold mills and a third in course of erection. Many excellent veins are known, and at present much development work is being done. The district has a good supply of water and timber. A few miles further south and near Squaw Peak on the eastern and western slopes of the range are deposits of lithographic stone in inexhaustible quantities.

Tests made of the stone in New York prove that though not equal to the Bavarian, it comes nearer to it than any other offered in the market. It can be taken out in any desirable size. Other strata or rock near the lithographic stone furnish a beautiful ornamental stone of variegated colors, which bears a very high polish and will rival onyx. Near Squaw Peak on the west slope some valuable gold veins have been found; also in the valley of Ash Creek, which lies at the western foot of the range.

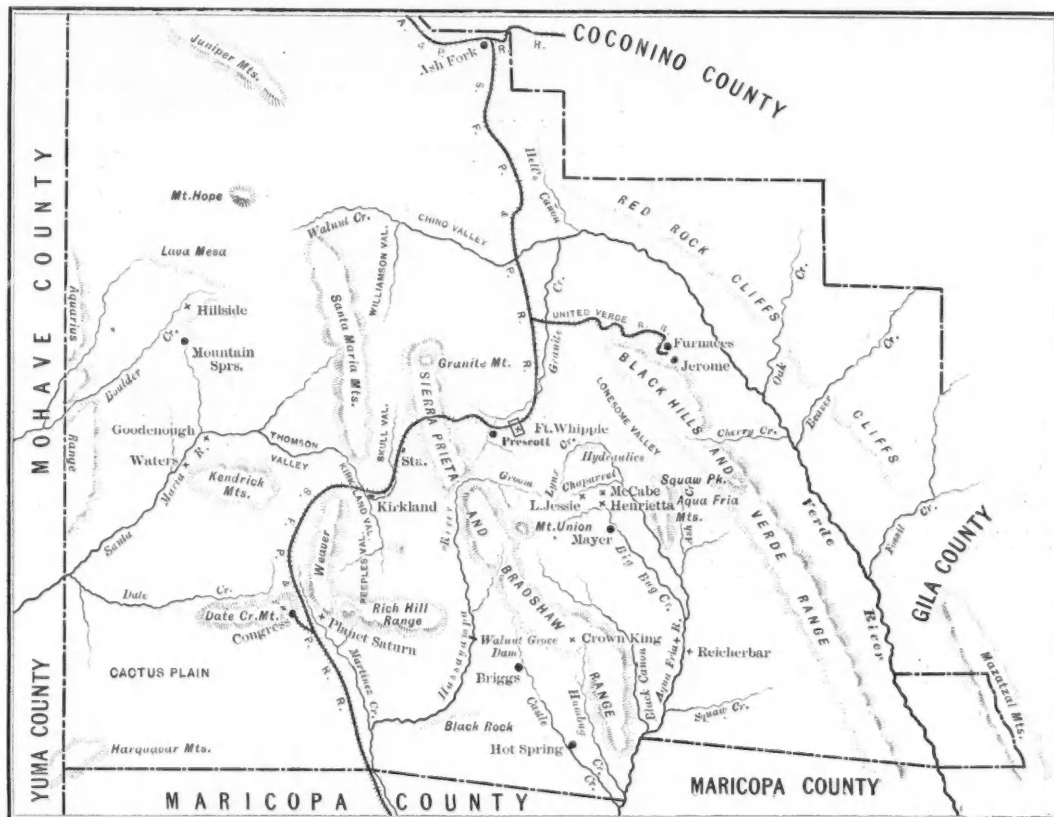
In the valley of the Agua Fria, the stream which drains the country between the Verde range and the Bradshaws for a distance of about 60 miles, there are many gold districts known. Commencing at the north end or the western foot of the Black Hills, the gold district of Lonesome Valley is first, next the Agua Fria Mountains, then the lower Agua Fria about Richenbar and Squaw Creek Cañon and the high ridge between Richenbar and the Black Cañon. Besides the gold veins copper deposits are found in the Agua Fria Mountains and at Copper Mountain.

Mining in the county was commenced in the sixties in the Sierra Prieta and Bradshaw Range. This range varies in height from 4,000 to 10,000 ft. above tide and much of it is covered with timber. In the early days the miners formed districts such as the Peck, Tiger, Turkey Creek, Hassayampa, Walker, Goodwin and other districts. The organization of county government for records finally did away with the mining districts except in name, and since then many localities have grown up under the name of districts without any legal status, the names being taken up from leading streams, peaks or best-known mines of the section. The use of the word district, therefore, in describing the situation of any mine has become only a custom. We speak of mines in Chaparral District, or its neighbor, Big Bug District, without being very close in the distinction, as the residents hardly know where the one

To this list may be added a long catalogue of smaller mines, most of which have sent their assorted ore to the Prescott sampler, not being supplied with mills for working the lower-grade ore. The fact that every district has its list of gold mines and veins will give some idea of the mineral value of the range. The claims located and recorded can be numbered by the hundreds, and still other discoveries are reported almost daily. To these may be added valuable veins of lead containing silver and gold—notably the Silver Belt, Chaparral District, the Belle-Poland and First Home in Big Bug District, Gladiator in Peck District, Sun Dance and Cook in Hassayampa District. This ore is also well represented in the Thumb Butte and Turkey Creek Districts. Probably no range of equal extent and equal value can be found in the United States, valuable mines and veins being found from the extreme north end of Granite Mountain to the desert of Maricopa County.

The Silver Mountain is a southwestern spur from the Bradshaw. Many veins of gold and silver ore are found in it, the principal one being the well-known Mammoth ledge. But little has been done there, as only heavy capital can take hold of it with any promise of success.

The country to the west of the Sierra Prieta and Bradshaw Range, and between it and the Weaver Mountains, is drained by Castle Creek and the Rio Hassayampa, having a nearly south course. Much prospecting has been done throughout this section, notably around Walnut Grove, Placerita, Briggs and Black Rock. In the first-mentioned many valuable ledges are known, as the Red Buck, Leadville and 96. At Placerita a 10-stamp mill was started in 1896 and ran with great success, producing about \$30,000 in gold. This has given a great stimulus to the district; many veins have been found and much development work done. Gold and copper ores have been found about Briggs on Castle Creek, and be-



MAP OF YAVAPAI COUNTY, ARIZONA.

begins or the other ends. On account of the generally mixed character of the ores, no one of these districts is referred to as either a gold, silver, lead or copper district, although in each case one or the other metal may predominate. In Chaparral it is gold, although there are veins in which lead is the principal ore. In Big Bug, the east end is nearly all gold—some copper—and in the west end, lead is the principal ore, but with a liberal accompaniment of silver and gold. In Walker, there is a mixture of all in the veins, the most valuable product being gold; in Groom Creek, silver and gold with some lead; in Slate Creek, rich silver veins and rich gold veins near together, but quite distinct from each other, and so on of other districts, of which there are many, reaching from a little north of Granite Mountain southward to the Maricopa County line, a distance of about 60 miles.

Nearly all the streams in this mountain range have been placered for the gold—notably Granite, Lynx, Big Bug, Hassayampa and Turkey creeks, and they are still being worked by rocker and sluice boxes. Lower Lynx Creek has for a number of years been worked by a little giant hydraulic machine, to which has lately been added a Bucyrus machine. The placer banks at that place are continuous on each side of the stream for a distance of six miles. The most notable mines of this range are the Peck, Black Warrior, Silver Prince, Dosoris, Blue Dick, Catctin, Tiger and Tip Top silver mines, which have produced some millions of dollars in that metal. The fall in the value of silver has closed them all; only two silver mines are working at the present time, the Lorena in the Bradshaw District and the Zero in Slate Creek District, the richness of the ores making them profitable. The most noted gold mines of the range are the Crown King, The Henrietta, McCabe, Little Jessie, Fortune, Senator and Jersey Lilly, which produced in 1896 about \$450,000 in gold.

tween them and the Hassayampa large gold veins have been found and opened to a limited extent, the best known being the Amazon, Mayflower and Mahoney groups. The best known deposits of the Black Rock District are those of copper, although many gold veins are also found.

The Weaver Range has an irregular course and is about 25 miles in length. The most noted point in the mining of Arizona—Rich Hill—lies in this range. The first discovery in the range was the coarse gold found on Rich Hill in the year 1864. It has been estimated that half a million was picked up on an acre of ground. The placers around the foot of Rich Hill, in Weaver Gulch on the east side and Antelope Gulch on the west have been worked ever since, and, at the present time, yield about \$20,000 per year. A number of gold veins have been found in that section, and are being developed. At Yarnell, the head of Antelope Gulch, a 20-stamp mill has been running for the last three years. On the edge of Peoples Valley is the Model Mine, one of the richest ledges in the country. On the southwest side of the mountain in Martinez District, is the Planet-Saturn Mine. This mine has been opened within the past 18 months. In that time over a mile of shafting and drifting has been done and a cyanide reduction plant with a capacity of 75 tons per day has been erected.

Next west of Weaver Range, and separated from it by Martinez Creek is the Date Creek Range, about eight miles long and running nearly east and west. Many gold veins have been found in this mountain, the most noted of which is the Congress Mine, the largest producer of gold in the Territory. It has now attained a depth of 1,700 ft., has a 40-stamp mill and a cyanide plant.

The Santa Maria Range, lying west of Williamson and Skull valleys,

has a length of 30 miles. So far no veins of note have been found in it, and it has had but little attention from the prospectors. In the country lying west of this range, and reaching to the Mohave County line, are vast fields of lava covering nearly half of that section. On the southern edge of this lava mesa lies the Eureka District, in which is the well-known Hillside gold and silver mine. To the south of this mine are large copper deposits; south of that and distant from Hillside about six miles are the lead veins around Mountain Springs. On the Santa Maria, at the northwest side of the Kendrick Mountains, many gold veins have been found and a 20-stamp mill has been erected. Active work is going on, and it is a district of great promise.

From this hasty sketch of the mineral field of Yavapai County, it can be seen that the field covers a large part of the area of the county. The miner can find gold, silver, copper or lead, nor is he confined to any one district in which to make his choice. The ores of the gold mines—gold mining being the main industry—vary in value from \$10 to \$40 per ton, run of vein. Of course, ores are sometimes found running up into the thousands of dollars per ton, but are not common. The fact that there are many "chloriders" who earn their living by shipping gold ore to the smelters, leaving the second class ores on the dump, is the best proof of the high-grade character of many of the veins. The second-class lots must await the erection of mills. There are now in the county 32 stamp mills having 390 stamps. To this may be added a few Huntington mills.

There are two smelting plants, the United Verde Copper Works at Jerome and a copper furnace at Curtis on the Big Bug Creek. The addition of general reduction works at a central point would be of great advantage to the whole county. Such an establishment would set many mines to work that cannot afford to ship their ore out of the Territory, and would also draw ore from Mohave County on the west and Maricopa County on the south.

Prescott, a town of 2,500 inhabitants, is easily reached from all the districts, and is the main point for supplies of all kinds. The Atlantic & Pacific Railroad skirts the county on the north boundary line and the Santa Fe, Prescott & Phoenix Railroad passes from the Atlantic & Pacific southward through the middle of the county to Phoenix. In time we expect to see it reach out branches to the various mining centers.

Among other valuable products of the county are the onyx-beds on Big Bug Creek, some 30 miles from Prescott, to the southeast. These beds cover an area of about 200 acres and average about 10 ft. deep. The quality of the stone is equal to the celebrated Mexican onyx which it greatly resembles.

There is an abundant supply of timber in the Black Hills and Bradshaw ranges, or it can be supplied from the vast timber areas on the line of the Atlantic & Pacific Railroad. No finer climate can be found in the United States; not excessively hot in mid-summer nor very cold in mid-winter, the working man need lose but few days in a year from stormy weather.

It is well to state that mining in the county is now in its infancy, especially deep mining. The Congress has reached a depth of 1,700 ft.; the Planet-Saturn, 700 ft.; Crown King, 400 ft.; Little Jessie, 500 ft.; McCabe, 400 ft.; Jersey Lilly, 350 ft. With these exceptions all the mines are shallow, below tunnel levels.

The mining industry is progressing is best shown by the record of production as follows:

	Copper, lbs.	Gold.	Silver, oz.
1883.....	1,325,534	.....	.....
1884.....	3,834,290	.....	.....
1885.....	168,388	.....	.....
1886.....	.....	.....	.....
1887.....	272,124	.....	.....
1888.....	3,085,651	.....	.....
1889.....	1,923,748	.....	.....
1890.....	5,475,573	.....	.....
1891.....	7,550,000	.....	.....
1892.....	10,000,000	.....	.....
1893.....	9,500,000	\$339,755	266,640
1894.....	12,000,000	867,840	256,931
1895.....	16,000,000	1,238,831	322,033
1896.....	19,800,000	1,579,659	181,389

It is impossible to find the county statistics of the production of gold or silver previous to 1893, as all reports previous to that date have included them in the production of the Territory. The falling off in the yield of silver has been solely due to the depreciation in the value of that metal. Nearly all the silver now produced is that which accompanies the gold. For the same reason no lead returns can be obtained, as no exclusive lead mine is worked. The few thousands of pounds produced are from the mixed ores carrying gold and silver. As soon as local smelting works can be established, the yield of lead will become quite an item. At present, the whole force in the county is devoted to the mining of gold and copper.

Every gold mine in the county, with two exceptions, that is now working at a profit has been developed and equipped by the wealth taken from the mine. This has necessarily been a slow process, and better results could have been obtained in much shorter time had capital been used at the start. At Prescott there is a sampler at which ores can be sold, and whence they are shipped to the smelters at Denver, Pueblo or El Paso. The erection of smelting works at Prescott would be of great advantage to the miners, as it would make a market for ores that cannot afford the long freightage to distant smelters. To the railroad it would give a much larger tonnage, as the coke coming in and the metal going out would much surpass the tonnage of the ores now shipped.

In this article we have made no attempt to set forth any individual interest, but to present the mineral wealth of the county as a whole. A long chapter might be written of its most noted mines, whose history reaches back to 1874. The want of railroad facilities in the early days did much to retard the development of the county, but that is now changed, and the progress that has been made in the past two years has excited the attention of the outside world and parties are constantly in the field seeking for investments.

French Imports of Iron Ore.—No less than 476,096 tons of iron ore have been imported into France from Germany during the first four months of the present year, as against only 396,470 tons in the corresponding period of 1896. Nearly all the imports are of minette ore from the mines of Eleass-Lothringen.

HEAT REQUIREMENTS OF THE SILVER-LEAD BLAST FURNACE.

Written for the Engineering and Mining Journal by L. S. Austin.

While the chemical changes and the heat requirements of the iron blast-furnace have been carefully investigated, the question, important as it will be shown to be, has not, as far as the writer knows, been undertaken for the silver-lead furnace. Guyard,* in 1880, gave a statement of the reactions which might be expected in the reduction of lead-bearing ores, Schertel† analyzed the escaping gases, and both he and Iles‡ measured their temperature. The latter likewise attempted to determine the heat of the escaping slag. These results, combined with what is attainable in the case of iron smelting, have enabled the writer to approximate to the requirements of the lead furnace. He could wish that sufficient data were available in the case of copper blast-furnace smelting to enable deductions to be made in regard to that. The analysis and final temperature of the outgoing gases, yet undetermined, are very necessary to the solution of the problem.

Let us assume a charge as follows, deducing from it the requirements under the ordinary working conditions of a furnace 36 in. X 120 in. in size, putting through 100 tons in 24 hours with a consumption of 15% coke:

	Weight.		Pb.		SiO ₂ .		Fe.		CaO.		S.		Speiss.	
	Wet.	Dry.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.	%	lbs.
Foul slag.....	400	400	4.0	16.0	33.0	132.0	25.0	100.0	21.0	84.0	0.8	3.2	.....	.....
Bedded ore.....	350	335	14.5	48.5	15.0	50.2	30.0	100.5	2.0	6.7	1.4	4.7	5.0	16.7
Silicious ore.....	160	150	6.0	9.0	60.0	90.0	10.0	15.0	1.0	1.5	0.7	1.0	.....	.....
Roasted ore.....	285	275	15.0	41.2	12.0	33.0	44.0	121.0	2.0	5.5	3.0	8.2	2.0	5.5
Flue dust.....	70	6.15	0	10.0	10.0	6.5	30.0	19.5	1.0	6.7	7.0	4.5	2.0	1.3
Oxidized lead ore	380	350	37.0	129.5	25.5	89.2	3.0	10.5	1.5	5.2	10.0	35.0	4.5	15.7
Limestone.....	375	375	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fuel 15%=300 lbs.	.....	.....	.....	6.0	.....	18.0	2.0	6.0	1.0	3.0	.....	.....	.....	.....
Total	2,000	1,940	.....	254.2	.....	430.1	.....	372.5	305.3	.....	.....	.....	.....	39.2
Slag = SiO ₂ = 34% = 430.1 lbs.														
FeO = 30% = 380.0 lbs.														
CaO = 24.2% = 305.3 lbs.														
88.2% 1,115.4 lbs. or														
Slag = 1,290 lbs.														
S in the Slag = 10.6 56.6														
S loss, 25% = 14.1 24.7														
Available sulphur = 31.9 = 55.8														
of Fe = 79.2														
Total Fe needed														

Corresponding to the above we have the following heat requirements of a blast furnace per ton of charge:

	Coke %.	Calories.
Gases passing from the furnace.....	0.63	9,000
Evaporation of water of coke and charge.....	0.35	49,400
Expulsion of CO ₂ from limestone.....	1.01	145,440
Reduction of Pb CO ₃ to Pb.....	0.26	37,855
" " Pb SO ₄ to Pb.....	0.47	67,600
" " Fe ₂ O ₃ to FeO.....	0.83	119,320
Decomposition of H ₂ O in blast.....	0.82	118,800
Fusion of slag (1,290 lbs.).....	5.38	774,060
" " matte and speiss (200 lbs.).....	0.83	120,000
" " lead to 1,000° C.....	0.07	9,245
Decomposition of CO ₂ to CO.....	3.01	437,400
Losses by convection, tyure water, etc. (by diff.).....	1.31	188,240
Total	15.00	2,157,300

Carbon burned to CO₂, 253 lbs. @ 8,000 cal. = 2,024,000.
FeS " " FeO, 41 " " 1,300 " = 53,300.
2,157,300

Let us review the results above given: The gases passing from the furnace are assumed to contain 5% CO and 17% CO₂, together with the nitrogen and the hydrogen and aqueous vapor of the charge. When the furnace is in good working condition, the temperature of the gases may be taken at 115° to 120° C., or 100° above the atmosphere. This figure is much exceeded, however, when there is overfire or a disposition toward it, but normally it is not a serious item. Fuel in excess is apt to expend itself in heating these gases, making trouble by overfire, and by increasing loss by volatilization of lead.

The amount of fuel used in evaporating the moisture of the coke and the charge is, as the table shows, small in quantity, and is more than counterbalanced by the lessening of flue-dust, where water is freely used for wetting down the charge. The wetting should, of course, be confined to the finer ore. Since the amount of lime, as well as of the slag, increases with the silica, we must look upon the heat requirements due to silica as being the most serious of all.

The fuel needed for reducing the ore is smaller in amount than has generally been thought. It shows that the increase of fuel by one or two per cent. for the purpose of obtaining better reduction is an exaggeration, and that the improvement in cleanness of slag should often be sought in other directions. Here comes in the question of the use of the hot blast, which has been thought to increase the loss by volatilization of the lead. The idea that there is such a loss arises from the supposed results of experiments early conducted in Germany; we would venture to say, however, that were the fuel decreased so that the initial temperature at the tyures were no greater than when not using the hot blast, there would be no greater loss by volatilization. The advantages of the hot blast, aside from some saving in fuel, are an improved condition of the hearth, the localization of the intenser heat at that point, the consequent increase in height of the zone of reduction and the diminution of the quantity of solid fuel, from which results a faster running of the furnace. It would probably turn out that the above-named objection would fall away, as indeed Blake's experiments§ with natural gas and iron blast-furnace practice indicate. In the Western United States, where the air is comparatively dry, the item of water decomposed by the blast would be much less than what is here given. The decomposition thus effected in the hot zone of the furnace may, however, have some useful effect upon the easily reduced lead ores.

* U. S. Geological Survey, Vol. XII.
† Berg & Hüttenmanische Zeitung, 1880, p. 80.
‡ School of Mines Quarterly, November, 1895.
§ Transactions American Institute of Mining Engineers, XV, 661.

We come now to the most important of the heat requirements of the furnace, the formation, namely, of the slag. When we consider that the items of reduction of the iron ore to FeO, the expulsion of the Co, from the limestone and the fusion of the components with the silica to form slag, takes up at least half of the fuel used in the furnace, and, where a sulphide charge is run, even more, we are compelled to conclude that the serious expense in smelting is the silica present; and that its cost of treatment, in light of such results, should be correspondingly modified. It illustrates also the importance of reducing the reused slag to a minimum by effective separation.

The heat needed to keep the lead liquid is trifling because of its low specific heat and its low latent heat (heat of solidification).

In those cases where the furnace is working to the best advantage, and where the amount of CO which passes off is small, there is a notable saving of fuel. Hence, the causes which vary the quantity of this gas, influencing its production, are important to be known.

The losses due to convection, jacket-water, etc., are quite variable. As the jackets become more coated with slag so the cooling water diminishes. Accretions which form the shaft, increasing the thickness of the containing walls, also act in the same manner. The figure given in the table is a low one, the amount often being in excess of this, and is proportionately more in the case of smaller furnaces. Its amount remains the same whether the furnace runs slow or fast, so that the percentage loss decreases with increasing tonnage.

Finally, the figures above given are to be modified according to the nature of the charge, and to the practice of the works where it is used. The data upon which they are based are approximate, and require

guides and connecting-rod bearings are self-oiling, and the pumps have an extra large valve area, which permits a high speed of piston travel. Ample room has been allowed for getting at the moving parts to adjust the packing, etc., the idea throughout being to make this the most perfect machine of its type. The pumps are made in a number of sizes and weights adaptable to all kinds of service.

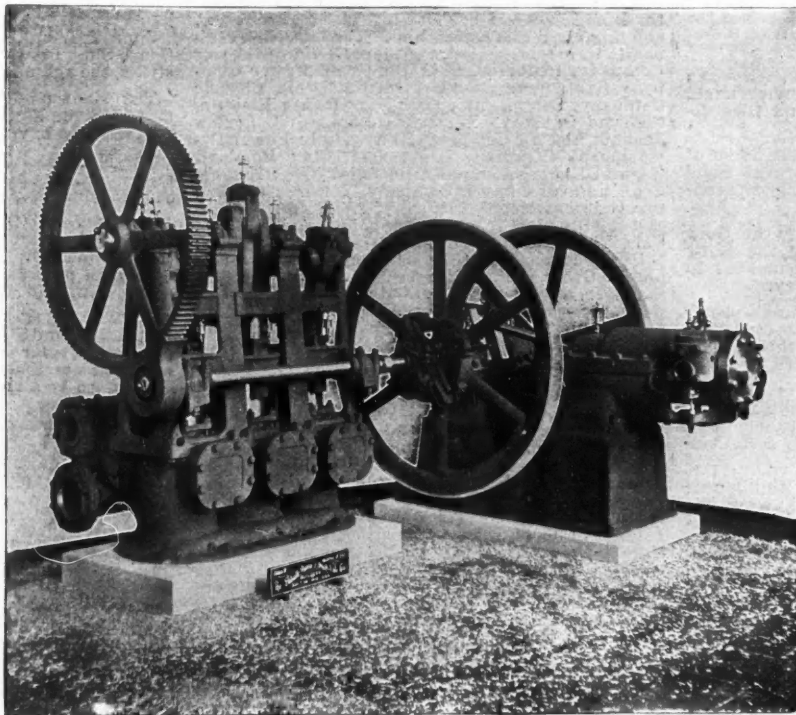
In the triplex pump shown, combined with a gas engine as a motive power, the connection is made with a friction clutch, so that it can be quickly thrown out or in. This makes a very compact outfit and one easier to operate than belts. These pumps were built by the Stilwell-Bierce and Smith-Vaile Company, of Dayton, O.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

(Specially Reported for the Engineering and Mining Journal.)

WRITTEN AND VERBAL CONTRACTS.—A written contract for the completion of an oil well partly drilled is admissible in evidence to explain a subsequent verbal contract between the parties to put the well in the condition in which it was supposed to have been at the time the written contract was made.—Taylor vs. Sattler (36 Atlantic Reporter, 323); Supreme Court of Pennsylvania.

MEASURE OF DAMAGES FOR CONVERSION OF COAL IN MINING.—The measure of damages for inadvertently encroaching upon and removing coal from adjoining property is the value of the coal *in situ*, before it is



TRIPLEX PUMP DRIVEN BY GAS ENGINE.

special investigation for exactness. It has not been until of late years that even these approximations have been possible owing to a lack of data. To attain such results a particular case should be taken, where all the elements for the calculation could be determined together. There would be needed the temperature and analysis of the escaping gases; an analysis of the charge and of the fuel; the losses by convection, jacket-water, etc.; the temperature of the furnace at different heights, and that of the escaping slag and matte.

The writer believes that the study of these matters would lead to unexpected and important results—the more important because the value of the materials operated on and of the saving in the precious metals which might be expected. It opens a vista wide and complex—a field in which little has been done and whose extent is unknown.

A GAS ENGINE PUMPING PLANT.

The application of the gas engine to a pumping plant for mining purposes may often be the most desirable solution where economical operation is necessary, or where fuel is expensive. In the accompanying illustration such an engine is shown connected to a triplex pump, of a class that is coming into use in many places for pumping water for mill and other purposes. Those pumps are built on the principle that a continuous action of the plungers produces a constant flow of water and resultant high efficiency. They have three plungers connected to a three-throw crank shaft, with the cranks set at an angular advance of 120°; the crank shaft is supported by four housings and bearings, forming a very rigid construction and perfectly balancing the strains, which in this type of pump are very unequal. The plungers are provided with crossheads and guides. The crossheads have adjustable bronze shoes for taking up wear. The connecting rods have strap heads, brass boxes and taper-key adjustments. The pumps are made both single and double acting. The double-acting pumps are provided with removable cylinders. The gears are machine cut; the countershaft,

mined, together with any other injury which may have been done to the land.—Warrior Coal & Coke Company vs. Mabel Mining Company (20 Southern Reporter, 918); Supreme Court of Alabama.

EMPLOYMENT OF FOREIGNERS IN MINES.—It is not, of itself, negligence for a coal-mining company to employ non-English speaking foreigners to work in its mine, nor by so doing does it forfeit the right to recover from the municipal or township organization for the loss sustained by the destruction of their property by a mob composed of such employees.—Spring Valley Coal Company vs. Spring Valley (65 Illinois Appellate Court Reporter, 571); Illinois Appellate Court.

MISSOURI MINING LAW—CARELESS BLASTING.—An information averring that one was the agent of a corporation which owned a coal mine in which coal was removed by blasting off the solid, and he willfully and unlawfully operated such mine without then and there having shot-firers to shoot the shots after the employees and others had retired from the mine, properly states a violation of the law of Missouri, Act of April 11th, 1895.—State vs. Murin (38 Southwestern Reporter, 923); Supreme Court of Missouri.

WHEN SUPERINTENDENT CANNOT RECOVER FOR INJURIES.—A field superintendent of a natural gas company, whose duty it is to supervise the testing of wells, cannot recover for injuries caused by the explosion of a valve on a fitting which he himself selected from the stock of the company and adjusted for the test, whether the explosion was due to the lightness of the fitting or to some defect which a proper examination could not have detected. The fact that an explosion occurred at a pressure of 720 lbs., and that an officer of the company told him before the test, but after the fitting had been selected and adjusted, that fittings of that size were supposed to withstand a pressure of 1,000 lbs., did not make the company liable for the injury.—Toohey vs. Equitable Gas Company (36 Atlantic Reporter) 314; Supreme Court of Pennsylvania.

PERSONAL.

MR. HENRY BRATNOBER has left San Francisco for Alaska in the interests of the Exploration Company of London.

MR. GEORGE D. ROBERTS, of New York, is prolonging his Utah visit, finding the gold regions of the State very attractive.

MR. ELLSWORTH DAGGETT, after a month in California, returned to Salt Lake for a few days, then departed for a fortnight in Idaho.

JUDGE W. A. SHERMAN has taken his family for a month's outing to Sunshine, Camp Floyd, Utah, where he is directing exploration undertakings.

MR. CARL ANDERSEN, mining and metallurgical engineer, has left Denver for a professional trip in the San Juan country, in Colorado, in the interest of Denver capitalists.

MR. JOHN DERN, president of the Mercur Mining Company, devoted the first week in June to the Grand Encampment District, Wyoming. His impressions are favorable.

MR. JAMES CRONAN, ex-superintendent of the Hale and Norcross mine, Storey County, Nev., has left the Comstock region for Rossland, B. C., going by way of San Francisco.

MR. JOHN SHEAHAN, general manager of the Montana Mineral Land Development Company, has returned to the property at Basin, Mont., from a four weeks' business trip to Ohio.

MR. GEO. W. MAYNARD, of New York, arrived in Salt Lake from the Gold Mountain District, Utah, early last week. He visited Mercur and then departed for San Francisco, Cal.

MR. JOSEPH E. SCHWAB, lately superintendent of the 33d street (Pittsburg) mills of the Carnegie Steel Company, Ltd., has been made assistant superintendent of the Duquesne Steel Works.

MR. HOWARD PASCHAL, secretary of the Gold Mountain Mining Company, operating the Ruby mine, in Jefferson County, Mont., has gone East to consult with the directors of the company.

MR. GEO. H. ROBINSON made a sudden reappearance in Salt Lake from a 10 days' trip to Montana. He found things in the Butte mining world prepared to welcome the advance wave of prosperity.

MR. JAMES E. MOYER has resigned his position as superintendent of the blast furnace of the Youngstown Steel Company, to become superintendent of Hannah Furnace of the Mahoning Valley Iron Company.

MR. H. VAN F. FURMAN, the well-known metallurgist, leaves Denver in a few days for Arizona, where he will take charge of the development of some copper properties for a Philadelphia syndicate. His address until September 1st will be Dragoon, Cochise County, Arizona.

MR. BERNARD MACDONALD, mining engineer of Butte, Mont., will spend the coming year in the Canadian Mining Provinces, in which he is commissioned to find mining property for a strong Canadian and European syndicate organized to carry on mining operations on an extended scale. His address in future will be 1759 Notre Dame street, Montreal, Canada.

MR. VICTOR GUTZU, a prominent engineer of Bucharest, Roumania, who has for several months past been traveling in America in the interest of his government, specially examining into the oil fields of the United States, is at present in Colorado looking over the oil-producing districts around Florence. He expects to return to Europe within the next few weeks.

MR. FRED D. SMITH, of the Department of Chemistry of Cornell University, and instructor in assaying in the same institution, left this week for Wyoming, where he will examine property for the Imperial Mining Company. The work will consist of a very thorough test and assay of each stratum of the cement ore on several claims owned by the company with a view of determining which layers are the gold bearing ones, and of obtaining an average value of this property. The mines are in the Big Horn Mountains, near Sheridan.

OBITUARY.

JOHN W. SHAW, formerly president of the Hocking Valley Railway, and a prominent California capitalist, died June 15th in New York. He was born at Kingston, N. Y., and was about 62 years of age. He was an original forty-niner, and was actively identified with the development of California, where he made his fortune. He had large holdings in Mexican silver mines.

C. REMIGIUS FRESENIUS, the well-known chemist, is dead. He was born in 1818 at Frankfort-on-the-Main, Germany. He was made professor of chemistry at the institute, at Wiesbaden, in 1845, and founded a laboratory, which has resulted in great developments, particularly of an industrial and agricultural nature. Professor Fresenius was

the author of several works on chemistry. Those best known in America, where they are extensively used as text books in colleges, are his *Manual of Qualitative Chemical Analysis* and *A System of Instruction in Quantitative Chemical Analysis*.

SOCIETIES AND TECHNICAL SCHOOLS.

BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.—The officers of sections at the Toronto meeting, which begins August 18th, have been selected, although others may subsequently be added to the list. All the officers expect to attend the meeting, and American men of science who are able to present will thus have the privilege of meeting many of the leaders in science of Great Britain. The officers of the Chemical Section are: President, Prof. W. Ramsay; vice-presidents, Prof. H. B. Dixon, R. Dunstan, Prof. B. J. Harrington, Prof. W. H. Pike, Prof. W. C. Roberts-Austen, T. E. Thorpe; secretaries, Prof. W. H. Ellis, Arthur Harden (recorder); C. H. Kohn, Prof. R. F. Rutlan. The officers of the Geological Section are: President, Dr. G. M. Dawson; vice-presidents, Prof. C. Le Neve Foster, Dr. H. Woodward; secretaries, Prof. A. P. Coleman, G. W. Lamplugh, Prof. H. A. Miers (recorder).

PACIFIC COAST TRANSMISSION ASSOCIATION.—The representatives of the electric companies of the Pacific coast met on June 7th and 8th at the office of the Blue Lakes Water Company, in San Francisco, and organized this association. The following companies were represented: Southern California Power Company, Redlands, Cal.; Big Creek Power Company, Santa Cruz, Cal.; Central California Electric Company, Sacramento, Cal.; Sacramento Electric, Gas and Railway Company, Sacramento, Cal.; San Joaquin Electric Company, Fresno, Cal.; Power Development Company, Bakersfield, Cal.; Portland General Electric Company, Portland, Ore.; Nevada County Electric Power Company, Nevada City, Cal.; San Gabriel Electric Company, Los Angeles, Cal.; and the Blue Lakes Water Company, San Francisco, Cal. The following officers were elected: C. P. Gilbert, manager of the Sacramento Electric, Gas and Railway Company, president, H. H. Sinclair, manager of the Southern California Power Company, vice-president; Robert McF. Doble, secretary of the Blue Lakes Water Company, secretary and treasurer; W. Frank Pierce, president of the Blue Lakes Water Company, and J. J. Seymour, president of the San Joaquin Electric Company, executive committee. The objects of the association will be mutual protection and collection and dissemination of information relative to the generation, transmission and distribution of electrical energy. The membership of this association will be representatives of the long-distance transmission companies. No dealer or representative of manufacturer will be eligible. The annual meeting will be held in June of each year; other meetings from time to time at the various electric plants on the coast. The next meeting will be held at Santa Cruz about the middle of August, when papers are to be presented on "Insulators," to be followed by discussions on the same subject.

FRANKLIN INSTITUTE, PHILADELPHIA.—The monthly meeting of the Mining and Metallurgical Section was held June 9th, Mr. Benj. Smith Lyman, president, in the chair. Mr. H. B. C. Nitze, chemist to the Wetherill Concentrating Company, Bethlehem, Pa., presented a paper "On Monazite," giving its chemical and mineralogical characteristics, occurrence (chiefly in North Carolina and Brazil) and industrial application for manufacturing the rare earths used in the production of the mantels for the Welsbach light. The interesting facts were noted that the annual production of this once so-called rare mineral is about 1,000,000 lbs. The finding of the mineral, naturally concentrated in sea-beach deposits on certain portions of the Brazilian coast, whence it is shipped as ballast, has so greatly reduced the price that the mining of the mineral in North Carolina has been abandoned as unprofitable. The paper was illustrated by a fine exhibit of the salts of the rare earths produced from monazite, which were shown by Mr. Waldron Shapleigh, chemist to the Welsbach Light Company.

Mr. Charles James, superintendent of the steel department of Henry Diston & Sons, described "A Special Process for Treating Cast Iron." White iron with approximate 2.40% combined carbon and 0.4% graphite carbon, and small proportion of Mn and SiO₂, is used for the purpose. The castings are placed in a muffle furnace, in which they are subjected to the action of a secret composition—said to be a powerful volatile oxidizing agent—and maintained at a temperature slightly below fusion for five or six hours. The product can be forged and tempered, and shows a remarkable increase in tensile strength. The total carbon in the product seems to be the same as in the untreated iron, but combined carbon has been substantially altered into a finely disseminated uncombined carbon. Doubts were expressed in the discussion which followed whether the result was not due entirely to the annealing, rather than to the medicine. The prolonged annealing was thought to be a sufficient explanation of the facts. The process is in commercial operation in a large foundry in Philadelphia, producing hatchets, hammers, etc.

Dr. D. K. Tuttle, melter and refiner at the United States Mint, in Philadelphia, gave an in-

formal account of the examination he had been officially called on to make in connection with an alleged discovery of a process of transmuting base metal into gold.

The investigation, as could be predicted, proved the fallacy of the alleged discovery, but disclosed the interesting circumstance that practically all the product sold as "pure" antimony by the best known dealers, contains distinct traces of gold.

The section adjourned over the summer recess, to reconvene on Wednesday, September 8th, when Captain Zalinski will lecture on "Japanese Swords," illustrating the subject with the aid of his large and valuable collection of these remarkable products of the metallurgical art.

At a meeting of the chemical section on June 15th, Dr. Joseph W. Richards, of Lehigh University, president of the section, gave a lecture on "A Critical Review of Methods for Determining Minerals." The programme at the Institute meeting on June 16th included a paper by Howard Murphy, civil engineer, entitled "A General System for the Sewerage of Suburban Philadelphia," and one by Col. C. Walseley Cox on "The Hutchinson Smoke-Consuming Furnace."

INDUSTRIAL NOTES.

The Falcon Iron and Nail Company, of Niles, O., has made a 10% reduction in wages, which took effect June 10th.

Jones & Laughlin Steel Company's mills on the South Side, Pittsburg, Pa., affected by the recent strike, are again in full operation.

The Montour Rolling Mill, at Danville, Pa., operated by the Reading Iron Company, is still being run, the men having accepted a reduction.

The Norwegian Iron Company's furnace at New Castle, Pa., has been leased by Naylor & Company, of Pittsburg, Pa., who will start it soon.

The Bellaire (O.) Edge Tool and Steel Casting Company is making preparations to remove its plant to Columbus, O. The company will utilize the new Hastings process of making edge tool steel from scrap iron, and will largely increase its force of men.

The Maryland Steel Company has received an order for steel rails for a railroad in India. They will be rolled at its Sparrow's Point works. The mill at that place is also engaged on rails for export to England.

Oliver Brothers' Tenth street mill in Pittsburg, Pa., resumed operations June 14th in the puddling, finishing and nail departments, after an idleness of a week due to lack of orders. About 300 men went to work.

The Union Iron Works of San Francisco recently shipped nine steel barges to Russia. They are to be used for the navigation of Siberian rivers in connection with the construction of the Trans-Siberian Railway.

The Delaware Iron Works, of Newcastle, will shortly ship 100 tons of trolley and telegraph iron poles for North and South Africa. Two hundred tons of these poles were recently shipped by this concern to Cairo and Cape Town.

The Niles Boiler Company, organized at Niles, O., by J. H. Orwig, T. F. Pendlebury, F. A. Gilbert and others, will engage in the manufacture of boilers, heaters, steel plate chimneys, annealing boxes, ladles and converters, molding flasks, crane girders, etc.

The Lockhart Iron and Steel Company, of Pittsburg, Pa., started three furnaces in the 16-in. bar mill on June 14th, and a large number of men were put to work in the puddling department. The mill has been idle for some time, owing to lack of orders.

The Reading (Pa.) Iron Company has posted a notice at the tube mill that the entire plant will be shut down indefinitely. This is owing to the mill not having enough sheet iron to continue at work, because of the puddlers' strike. At least a thousand men are affected.

The Pottstown (Pa.) Iron Company made a general assignment June 11th to the Equitable Trust Company for the benefit of creditors. The company has been in existence since 1866. It failed in 1893, at which time receivers were appointed. The capital was \$1,000,000.

The McKeesport Illuminating Gas Company's property and franchises have been transferred to the United Coke & Chemical Company, of Glassport, Pa., for \$100,000. Gas will be furnished from the by-product coke ovens of the company and the prices reduced from \$1.25 to 75c.

The Pioneer Manufacturing Company's furnaces at Thomas, Ala., which went out of blast some time ago, blew in last week and the Alabama Rolling Mills at Gate City followed example. There are now 17 furnaces in the Alabama District in blast, and the output is something like 3,000 tons per day.

Messrs. Stein & Boericke, Limited, Philadelphia, Pa., have closed a contract for a very complete coal-washing and separating plant with the Jefferson

Coal and Railway Company, of Baltimore, Md.; Mr. Henry S. Jenkins president and manager. The plant will be built at Lewisburg, Ala., near Birmingham.

At the American Tube and Iron Company's works, Middletown, Pa., four furnaces have been started this week, two in the butt mill and two in the lap mill. The galvanizing department will also resume work in a few days. Indications for continuous operations at these works for the summer are encouraging.

The Madison Car Company's plant was sold June 12th by the Master in Chancery of Madison County, Ill. The sale was held to satisfy bonds to the extent of \$500,000, issued four years ago, on which the interest had been defaulted. Over \$1,000,000 is said to have been expended in the purchase of the site and making the improvements.

At the Ellwood Tin Plate Company's plant at Ellwood City, Pa., five mills are now in full operation. Two stands of rolls have been added to the original four mills, and these six stands constitute four complete mills, one roughing stand to two stands of finishing. A single stand, with especially long rolls, has also been added, making five mills in all.

The St. Joseph (Mo.) Bar & Axle Company has been reorganized and the works are expected to be in readiness for shipping orders about June 15th. The company will manufacture railroad supplies, cut nails, shovel plate, boat and dock spikes, etc. The cut-nail department has been equipped with 50 machines. The company has decided to produce shovels complete, instead of making only the plate, as heretofore.

The Mount Pleasant Mining Company, of which Mr. Benjamin Nicoll is president, is now sole agent for the Wharton iron in all sections of the country, having been appointed by Mr. Joseph Wharton, of Philadelphia. The furnace has just blown in and is making a high-grade foundry iron from New Jersey magnetites and Lake Superior hematites. With the new laboratory connected with this plant they are enabled to guarantee the chemical analysis of each shipment.

The American Tin Plate Company of Anderson, Ind., has had its lease canceled by Erastus Foote, Adrian Vanderkloot, W. D. Kent and Robert Vierling, of Chicago, constituting the directory of the Premier Steel Works of Indianapolis. The tin plate company leased the plant, conditioned that at the expiration of one year, if found not profitable, the same could be surrendered. The breaking of the pool and the reaction of steel billets from \$22 to \$14 made its operation unprofitable, and the plant closed down some time ago. There is no immediate likelihood of a resumption of business.

The Baltimore & Ohio Railroad Company's receivers will apply to the United States Court for authority to issue \$680,000 additional receivers' certificates, to bear interest at 5%. They will be a lien prior to mortgage and also to the \$5,000,000 6% receivers' certificates issued June 1st, 1896. The obligations will be turned over to the Carnegie Steel Company in payment for 40,000 tons of steel rails at \$17 a ton. It is said that the Carnegie Company has already negotiated the sale of the certificates. The issue will be vigorously opposed by the bondholders, and the indications are that a stubborn fight will begin in the courts when the receivers file their application.

Fraser & Chalmers, Limited, held the ordinary annual general meeting of the stockholders in London on June 4th. The notice read by the secretary (Mr. T. Gurdon Palin) is in part as follows: "You will notice with satisfaction that at last we have entered upon the dividend-paying stage again, and we will ask you presently to declare a dividend at the rate of 5%. I think it wants some explanation that this amount is not higher, as our accounts show a result very much superior to the sum we are distributing. Our earnings during the year have been nearly £50,000, whereas we are distributing only between £15,000 and £16,000. The reasons are principally these, that, although our accounts show that we have had a favorable year, we are not exactly very flush of cash, and we always thought it was best in the interests of the shareholders to stand as much as possible upon our own resources, so that we should not have to borrow money when required. Another reason is the position of the American corporation, of which we are shareholders, as you know. It is true that we have done in America a larger business last year than we have done for several years preceding, but the conditions of trade in that country unfortunately are not favorable yet, and the profit earned has been an extremely small one, being only sufficient to meet the debenture interest and leave a small balance over. We have made several important changes of an expensive nature, and these have come out of the current expenditure; therefore, the position is really somewhat better than it appears from the accounts. We have thought it desirable to make a change in our representation in Africa. Our new representative is Mr. W. E. Perk, who knows the business thoroughly, and has been our agent in other parts of the world for many years, and in whom we can place most absolute confidence. Our operations at Erith have fully justified our existence there, and have made a very satisfactory show for 1896. We had to create this business entirely; we had to buy the land, build

the factories and establish a connection; and it takes time to get into full swing. We have done a large and profitable business, and we have given great satisfaction to all we have supplied. As you see from the balance sheet, we have beside a very handsome profit which we carry forward, provided liberally for depreciation of all kinds, and I can conscientiously say that every figure appearing in our Erith balance-sheet is well represented by value. We have undertaken a great many alterations and improvements from time to time which do not appear in the balance sheet, and which come out of current expenses. These have added greatly to the value of our property, and we have really now at Erith a very fine estate. Last year was a somewhat exceptionally good one; there was great activity in the mining market; many companies were started and large installations were ordered. We benefited very much by these happy circumstances."

A dividend of 5% on the ordinary shares was declared; the retiring directors, Messrs. J. C. Werner and Hamilton Smith, were re-elected, as also were the auditors, Messrs. Deloitte, Dever, Griffiths & Company.

NEW PATENTS.

UNITED STATES.

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

WEEK ENDING JUNE 5TH, 1897.

- 583,915. APPARATUS FOR GENERATING GAS. Burdett Loomis, Hartford, Conn. The combination with the furnace-shell having tangential openings near the top and an escape-flue at or near the bottom and vertical retorts, of the injector burners set in the tangential openings for giving the flame and hot products a spiral movement around the retorts from top to bottom, an air-heating chamber connecting with the escape flue at the bottom of the retort-chamber and containing series of connected air-heating pipes and a pipe connecting the air-heating pipes with the injector burners.
- 583,936. ELECTRIC FURNACE. Edgar F. Price, Niagara Falls, N. Y. Assignor, by mesne assignments, to the Electro Gas Company, of West Virginia. The combination with a hearth having a slab of carboea and forming one electrode, of inclosing walls, a wall and roller for supporting one end of the hearth, and an adjusting-screw for regulating the inclination of the hearth, and carbons adjacent to the hearth forming the other electrode.
- 583,964. MINE-CAR. James S. Woodcock, New Lexington, O. The combination with the car-body and axle-binder boxes oppositely located thereon, each of the binder-boxes being provided with base extensions, and wheel-carrying axles supported in the boxes, of binder-bars connecting the outer and inner ends of the box extensions.
- 583,974. PROCESS OF ENAMELING METAL. John Boston, Chicago, Ill. The process consists in treating an article with a solution of aluminum acetate, and then decomposing the acetate of aluminum by means of heat and moisture, leaving the article covered with an alumina coating.
- 583,993. PROCESS OF AND MEANS FOR DISINTEGRATING QUARTZ. Adolf Gutensohp, London, England. Assignor to Louis Henry Goodman, Joseph Edward Lilley and John Chapman, same place. Patented in South African Republic June 25th, 1896, No. 1,15; in France July 13th, 1896, No. 258,056; in Austria July 27th, 1896, No. 49,461; in Hungary July 27th, 1896, No. 6,626; in Spain, July 28th, 1896, No. 19,423; in Cape Colony August 7th, 1896, No. 587/1,199; in Natal August 10th, 1896, No. 64; in New Zealand August 17th, 1896, No. 8,749; in Victoria August 19th, 1896, No. 13,398; in South Australia August 20th, 1896, No. 3,565; in New South Wales August 21st, 1896, No. 6,827; in Tasmania August 22d, 1896, No. 1,691; in Brazil September 11th, 1896, No. 2,124, and in Orange Free State September 28th, 1896, No. 89. The process consists in heating the ore as to its upper portion to dull red heat by reducing or hydrogenized products of combustion, and as to its lower portion to white heat by radiant heat alone without contact with air, products of combustion or free hydrogen; chilling the ore repeatedly *in situ* and finally dropping the finely divided pieces of ore when white hot into cold water.
- 584,037. EXCAVATOR. William H. Fulcher, Stockton, Cal. Assignor to the Stockton Trench Excavating Company, same place. The combination of a wedge-shaped knife, side-cut knives, connecting-rods, a lifting bar, a shaft, rack bars and interposed pinions mounted on the lifting bar.
- 584,051. MACHINE FOR CHARGING OPEN-HEARTH FURNACES. Joseph P. Eck, Muncie, Ind. Assignor of one-half, to John H. McGrath, same place. The combination with the furnace doors, of a track arranged over the front of the furnace for supporting one end of the charging mechanism, means for elevating and lowering the track, and means connecting the doors of the furnace and track.
- 584,080. SEPARATOR AND AMALGAMATOR. Peter Litter and Hippolyte L. Vandre, San Francisco, Cal. An apparatus consisting of a shaking-screen surfaces disposed at levels upon which the sand and gold are distributed in thin strata, the screen surfaces having perforations of successively decreasing areas whereby a separation occurs in each screen, means connected with one portion of the screen for shaking it, vertically-mounted screens on opposite sides of the other portion of the screens and having gears upon their upper ends, and a shaft having like gears whereby the inclination of the screens may be varied.
- 584,086. ORE-GROUNDING MACHINE. William A. Woods, San Francisco, Cal. Assignor of one-half to Solon Pattee, same place. The combination of a grinding-pan having a rounded inner concave of a grinding-piece at the sides and bottom, a central vertical sleeve, a vertical driving-shaft, a driver secured thereto extending down into the pan, a die fitted within the pan with a space between it and the inner concave of the

- pan, the die having an annular chamber in its bottom between its inner periphery and the bottom of the pan, in which the amalgam or mercury may collect and remain undisturbed.
- 584,104. ARTIFICIAL FUEL. Henry E. Brissett, Lowell, Mass. Assignor of one-fourth to Benjamin Benoit, same place. A composition of crude petroleum, rosin, crude paraffin and vegetable fiber mixed in about the proportions specified. Also the process of producing an artificial fuel-brick.
- 584,105. ARTIFICIAL FUEL. Henry R. Brissett, Edward Cousins and Benjamin Benoit, Lowell, Mass. The composition of an absorbent material, crude petroleum bituminous pitch and a binder or cementing medium formed of pitch, rosin and fluid coal-tar, and the process of manufacturing artificial fuel-bricks.
- 584,112. COAL-CONVEYOR. Robert C. Greener, Boston, Mass. The combination of a yard track extending longitudinally of the yard, an elevated portable track mounted to move thereon, and two shed-tracks, one above the other, with a carriage mounted to move on the upper shed track and on the portable track, and a portable elevator mechanism having wheels adapted to run on the upper shed track and on the portable track, provided at its lower end with rollers to run on the lower track.
- 584,126. SEPARATING SIEVE. Hans Bittenger, Berlin, Germany. Patented in France, June 6th, 1890, No. 206,698; in Germany June 25th, 1890, No. 55,790, and October 5th, 1890, Nos. 59,378 and 62,934; in England July 19th, 1890, No. 11,331; in Switzerland November 10th, 1890, No. 3,145; in Belgium, November 12th, 1890, No. 92,689; in Spain February 3d, 1891, No. 11,571; in Austria-Hungary, May 5th, 1891, No. 47,351 and No. 76,155, and in Italy June 30th, 1891, XXV., 29,545, LVIII., 110. The combination of a fixed frame, a sieve frame, a plurality of resilient rods arranged at each end of the sieve frame, and rigidly secured at their lower ends to the fixed frame and at their upper ends to the sieve frame, and a crank or eccentric on a vertical shaft located centrally of the sieve frame, whereby an elastic and equal support is afforded at opposite sides of the crank or eccentric and the centrifugal impulse counteracted.
- 584,142. STONE-CRUSHER. Philetus W. Gates and Charles L. C. rman, Chicago, Ill. Assignors to the Gates Iron Works, same place. The combination of a stationary crushing jaw, a reciprocating crushing jaw arranged opposite the stationary crushing jaw and adapted to have equal or different motions at each end thereof.
- 584,169. PLANT FOR ANNEALING METALLIC TUBES, WIRES, &c. Samuel A. Sague, Cleveland, O. The combination of a furnace having an oven or annealing chamber wide enough to receive the closed cylinder or container laterally, and provided with a doorway that leads to the forward end of the chamber and is wide enough to accommodate the introduction of the closed cylinder or container, a door for closing the doorway, a track or path arranged transversely of the bottom of the rear portion of the chamber, a cradle or trolley arranged to rest upon and move endwise of the track or path, a door formed in the rear portion of the furnace in line with the path of the trolley or cradle and having the dimensions required to accommodate the passage of the laden trolley or cradle therethrough, and a door for closing the last-mentioned doorway.
- 584,242. PROCESS OF MAKING COMMERCIAL LEAD FROM LEAD ORE. Pedro G. Salom, Philadelphia, Pa. The process consists in subjecting the ore to the action of nascent hydrogen, electrolytically developed, producing thereby a spongy mass, and afterward, while the mass is in a non-oxidized condition, applying a consolidating pressure thereto.
- 584,260. SAFETY-GRIP FOR MINING-CAGES. William H. Beakey, Walkerville, Mont. The combination of vertical guides in the shaft, and locking mechanism for engaging the guides, of the lever-arm connected with such mechanism, the pivoted crab which normally engages the arm, the lever and connecting-rod for operating the latter, and a catch for supporting the lever.

MACHINERY AND SUPPLIES WANTED.

If any one wanting machinery or supplies of any kind will notify the *Engineering and Mining Journal* of what he needs he will be put in communication with the best manufacturers of the same. We also offer our services to foreign correspondents who desire to purchase American goods, and shall be pleased to furnish them information concerning goods of any kind, and forward them catalogues and discounts of manufactures in each line. All these services are rendered gratuitously in the interest of our subscribers and advertisers; the proprietors of the *Engineering and Mining Journal* are not brokers or exporters, nor have they any pecuniary interest in buying or selling goods of any kind.

GENERAL MINING NEWS.

OIL EXPORTS—According to the monthly statement of the Bureau of Statistics the exports of mineral oils in May, 1897, were as follows: Crude, 8,780,425 gals.; naphthas, 615,563 gals.; illuminating, 70,291,800 gals.; lubricating and paraffin, 3,590,021 gals.; residuum, 1,437,576 gals.; total, 84,714,904 gals., against 84,562,853 gals. in May, 1896. For the five-months ending May 31st, 1897, the exports amounted to 365,156,673 gals., showing an increase of 14,686,358 gals. over 1896.

ARIZONA.

COCHISE COUNTY.

COMMONWEALTH MINING COMPANY.—The construction of a 60-ton mill on this company's property at Pearce is being pushed.

GOLDEN QUEEN CONSOLIDATED GOLD MINING COMPANY.—In our issue of June 12th it was stated that the Golden Rule mine had been sold to G. W. Bibbens, of Philadelphia, for \$50,000. We are now informed that the purchase was made for the above company. Mr. Bibbens is on the ground in charge of the development work, which is being pushed. Large bodies of ore have been blocked out, and it is expected to begin shipments at once to Pueblo, Colo., and El Paso, Tex. The secretary and general

manager of the company is Frank Playter, and the offices are at 708 Fourteenth street, Washington, D. C.

MARICOPA COUNTY.

PHENIX GROUP.—A vein of 18 in. of gold ore was struck in one of the mines that is said to assay well. The ore is exposed in the face of the 250-ft. tunnel, at a depth of 135 ft.

PIMA COUNTY.

SAGINAW MINING COMPANY.—This company is developing the Saginaw mines, 3 miles south of Tucson, with a view to doing deep work. The ledge on the 50-ft. level is 10 ft. wide and between good walls. When ground is opened to supply sufficient ore they will erect a 300-ton concentrating plant and pump water from the river, 3 miles distant.

SAN XAVIER.—New York capitalists have closed the purchase of this group of mines from the Boston owners. The group comprises seven mines extensively developed. They were first discovered and worked 30 years ago, and are considered to contain the largest deposits of copper, silver and lead ores in Southern Arizona. The mines are situated 16 miles south of Tucson.

TRES AMIGOS.—In driving a tunnel on the vein recently a 6-in. streak of ore was struck which yields high values in gold. This rich streak has widened to 12 in., continuing its richness, and the remaining body of ore keeps up its grade as the drift is pushed forward. The ore is shipped to Denver. They have a 10-ton mill on the mine, but find it pays better to ship the ore than to work it. The mine is bonded to Eastern parties, and the lease expires next week.

YAVAPAI COUNTY.

(From Our Special Correspondent.)

BIG BUG ONYX MINING COMPANY.—George C. Underhill, a marble expert of Rutland, Vt., with five Eastern quarrymen, is on his way to the mines of this company, located about 28 miles southeast of Prescott. A large force of men will be put at work and the property will be opened up on a large scale. The mine was recently purchased by Eastern parties for \$50,000.

YUMA COUNTY.

KING OF ARIZONA MINING COMPANY.—The development shaft in this company's mine is now down 30 ft. and shows the ore richer and wider than on the surface. The rich streak is 3 ft. in width and the balance of the ledge is high grade.

CALIFORNIA.

(From Our Special Correspondent.)

On June 5th, Gov. James H. Budd appointed the following named persons as delegates to the International Gold Mining Convention, which will meet at Denver on July 7th: E. M. Preston, F. H. Thomas, W. R. Eckhard, A. Fregridge and W. F. Prisk, from Nevada County; Edward Coleman, Louis Glass, S. K. Thornton, Robert McMorry, Almarin B. Paul, W. S. Keyes, John D. Seibe, D. Gutmann, Charles D. Lane, Louis Garnett and W. C. Ralston, from San Francisco; F. Todd, Los Angeles; W. C. Chapman, from El Dorado County; J. N. Neff, from Placer County; E. Ginocchio, W. F. Detert, J. F. Park, John Ross, Jr., and T. T. Lane, of Amador County; James O'Brien, from Yuba County; J. J. Crawford, from Alameda County, and Frank Wehe and Harry G. Stow, from Sierra County.

AMADOR COUNTY.

(From Our Special Correspondent.)

UNION CONSOLIDATED GOLD MINING COMPANY.—At the last regular meeting of this company the following officers and directors were elected: Wm. Matson, president; J. F. Plageman, vice-president; W. S. Davis, treasurer; G. E. H. Baker, secretary; F. C. Seibe, Jos. Martin and M. J. Madison, directors. This company is operating the property formerly known as the Clinton mine located about 6 miles southeast of Jackson.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

ALTAVILLE GOLD MINING COMPANY.—The Keystone mine, 1 mile north of Angels Camp, is to be worked by this company. The present development work consists of two shafts down about 100 ft., connected at the bottom by a 65-ft. drift. There are three parallel veins on the property about 25 ft. apart. The average assays are \$4 per ton. The new management will sink to a depth of 400 ft.

BLACK DIAMOND.—These copper mines, located 10 miles northeast of Redding, have been sold to a New York syndicate represented by Homer Wilson, for \$115,000. These mines are believed to be as extensive as the Mountain Copper mines, the ore body, as far as prospected, showing a width of 250 ft. and a length of 1½ miles. The copper assays show from 7% to 20%, besides the gold and silver.

GHOST.—This mine, one-eighth of a mile east of the Utica, just outside of the town of Angels Camp, owned by Drake & Tryon, has been sold to L. R. Vandermeulen and Leopold Meyer, of London, for \$330,000.

GWIN.—At this mine, 4 miles south of Mokelumne Hill, the management has decided to reopen and repair the old south shaft, pump out the water and then sink a new shaft to the east of it. In the stopes between the 1,200 and 1,300-ft. levels, a streak of iron pyrites has been encountered which assays very high in gold.

LAST CHANCE.—A controlling interest in this property at Angels Camp has been purchased by a Belgian syndicate. This is one of the oldest mines in the State, and has produced some very rich ore. The new company will put a large force of men at work at once.

MAY DAY MINING COMPANY.—This company, operating five claims in the Murphy District, is at present driving a 200-ft. tunnel to tap the ledge at the 700-ft. level.

MOKELUMNE & CAMPO SECO CANAL AND MINING COMPANY.—At the annual meeting of the stockholders of this company held June 1st, the following officers and directors were elected: S. Foorman, president; I. S. Foorman, secretary; C. E. Prindle, superintendent, and Thomas Peters, Sr., and M. S. Eisner.

KERN COUNTY.

(From Our Special Correspondent.)

RAND MOUNTAIN MINING COMPANY.—This company has brought suit against the Sunlight Gold Mining Company, Rose L. Burcham, John Singleton, Patrick Reddy, J. C. Campbell and W. H. Metson, alleging that the Sunlight company owns an interest in the one-half of the mining claims known as the Rand, Olympus, Tribby, Singleton, Johannesburg and Desert View, held by Rose L. Burcham and John Singleton; the exact nature of which is to the complainants unknown, but for which the respondents gave a contract of sale to Patrick Reddy, by which they agreed to sell to Reddy their interest for the sum of \$100,000, which was accepted, but Reddy conveyed all his interest by virtue of contract to the Sunlight Gold Mining Company. The complainant asks that this matter be adjudicated and that a receiver be appointed and the property sold, as it cannot be partitioned.

LOS ANGELES COUNTY.

(From Our Special Correspondent.)

SOUTHERN CALIFORNIA POWER COMPANY.—This company has been organized to develop the water power in Southern California. It is proposed to transmit electric power from Santa Ana Canyon to Los Angeles, a distance of 80 miles. The power is derived from the waters of the Santa Ana River and is taken from the river by canal, flume and tunnel work along the side of the canyon to a point where it suddenly drops through 2,200 ft. of pipe a distance of 750 ft. to the water wheels. This will give an enormous pressure. The power generated will be sold to companies in Los Angeles and Pasadena, and will be used both for street railway and for lighting purposes.

NEVADA COUNTY.

(From Our Special Correspondent.)

GASTON RIDGE MINING COMPANY.—At the California mine, 4 miles west of Grass Valley, which is being worked by this company, Superintendent Harmon reports having run through a number of quartz stringers, then through a slate formation and is now in solid quartz which looks well.

NORTH BLOOMFIELD GRAVEL MINING COMPANY.—United States Circuit Judge Ross on June 8th granted an injunction enjoining this company from carrying on hydraulic mining until it has complied with the law as laid down by the Caminette Act passed by Congress. Judge Ross in his decision upholds the constitutionality of the Act of Congress, and the right of the Debris Commission to regulate and control methods and means of this class of mining. This company operates one of the largest hydraulic systems in the State.

SUMMIT.—This mine, 1 mile south of Nevada City, is rapidly filling with water on account of an accident to the pumps.

RIVERSIDE COUNTY.

INDIANAPOLIS & CANYON SPRINGS GOLD MINING COMPANY.—This company was recently incorporated with a capital stock of \$1,000,000. The directors are A. C. Hogaboom, W. C. Hogaboom, E. E. Bowles, of Los Angeles; W. H. Webster and G. R. Wyson, of Indianapolis. The company's mines are in the Salton region.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

WATERLOO MINING COMPANY.—In an opinion handed down on June 8th by the Judges of the United States Circuit Court of Appeals, in the suit brought by the executors of J. S. Doe against the above company, to restrain the latter from sinking a shaft through its own grounds into the Doe claim, Judge Ross held that if the defendants could show that their shaft ran on one continuous vein, no injunction could be granted, and that the Waterloo people could follow their Silver King vein into the Doe property, but could not touch the third vein, known as Oriental No. 2 vein. The above mines are located in the Calico District.

SISKIYOU COUNTY.

PORTLAND MINING COMPANY.—This company has acquired about 1,500 acres of placer mining ground on the lower Klamath River, in the Happy Camp Section, near the Oregon line, and shipped out two carloads of machinery and supplies from Portland to Yreka, including a sawmill with a capacity of 35,000 ft. per day.

TRINITY COUNTY.

ALTOONA.—The flood from the artesian well at this mine at Cinnabar is hard to conquer. Three new huge steam pumps are kept running steadily

night and day. It is believed the water will soon be lowered enough to put men at work on the upper levels.

COLORADO.

BOULDER COUNTY.

BELCHER.—The water is being taken out of this mine, at Caribou, with a view to working it on a more extensive plan. This property has produced some rich silver ore and at present the different levels and stopes are said to show fine bodies of high-grade mineral.

ST. LOUIS.—This mine has stopped operations for the present on account of the surface water and while idle will erect a shaft-house and put in a hoisting plant.

EL PASO COUNTY—CRIPPLE CREEK DISTRICT.

ROCKY MOUNTAIN.—This property, on Beacon Hill, under bond and lease to Blunt Bros. and associates, has made three shipments, the last one returning \$105 per ton. Work is now suspended temporarily, negotiations being under way for a sale of the lease.

GILPIN COUNTY.

GREGORY-BOBTAIL.—A rich strike is reported to have been made in the 9th level of this mine, at Central City. The value of the ore cannot be known, as the operators of the mine refuse to make it known, and have placed an armed guard at the mine, but it is known that the vein struck is 2 ft. in width, and is full of wire gold.

HUERFANO COUNTY.

VICTOR COAL AND COKE COMPANY.—This company has secured a lease on the State coal lands, near Walsenburg, which have formerly been held by the Colorado Fuel and Iron Company. The award was made at the meeting of the land board, where three different parties bid for the land, the Victor Company offering the highest royalty to be paid the State for the privilege of holding the lease. The company has bound itself to pay the State a royalty of \$41,000 for the coming 10 years, while under the terms of its lease the Colorado Fuel and Iron Company would only have paid \$600 for the 10 years. This company, however, will contest in the courts the validity of this lease, as they have expended \$250,000 in improvements on the land which the Victor Coal Company has secured, and they regard this as too large a sum to lose in this manner. When their lease was about to expire that company asked for a renewal, agreeing to pay a minimum annual royalty of \$200. It was voted to grant the lease; the company made out a bond and everything was done except the issuance of the lease. The present board reconsidered this action and it was decided to allow the different companies to prospect the land, which resulted in the award by bidding.

LAKE COUNTY.

(From Our Special Correspondent.)

BIG SIX.—Since VanCamp and others have taken hold of the Nettie Morgan shaft under lease they have done a great deal of important work and are now shipping about 40 tons a day from the strike made a few weeks ago. The stuff runs well in gold and it is stated the lessees have plenty of it. But little information is given as yet, but work is being pushed ahead quietly with about 25 men.

CATALPA.—Very nearly 200 tons a month of manganese iron is being shipped from the different shafts on this property, and a good share of this goes to the Illinois Steel Works. Some new development work is being carried on, and the ore bodies are being extensively operated in all directions.

CORONADO.—Twenty carpenters are now at work at the Coronado ground and are fast reconstructing all the buildings, etc., which were burned to the ground during the riot. The Coronado people have a fine plant of machinery already on the ground, and Manager Estey states that they will be ready to resume by the time the pumps are in position.

DODDRIDGE LEASE.—This lease, on the Vivian, is a big thing and the lessee is now to run a winze to again locate the iron ore body which is dipping. This body was caught but a few weeks ago and shows a width of 60 ft.

DOWNTOWN PUMPING.—At this writing it looks as if the pumps are to be at Leadville even earlier than was anticipated, and if all goes well that early in July they will be in place and at work. Word was received last week that the pumps would be completed and ready to turn over to the purchasers by June 15th. Accordingly the designer of the plants left for Buffalo and if the pumps are made as per order they will be accepted at once and shipped direct to Leadville. In this case they will be here about July 1st, and almost in position if not at work. The fact that the machinery is about ready has stirred up the other downtown propositions, which will be worked with balers and tanks and the managers of these mines are having their preparatory work done. The idea is not to delay the work a moment after the arrival of the machinery, and if all goes well a general resumption will be recorded in July.

LUZERNE.—This property is at the head of East Sixth street, Leadville, and the owners are pushing work in very good contact and expect to cut the ore chute almost any day.

NIL DESPERANDUM.—Thos. Ovens, the manager of this property, returned from Denver a few days

ago and is preparing to start up again and to develop the find which was made some weeks ago. I understand that it is the intention to put down a new shaft.

PAWNOLAS.—The new shaft on the north side of Evans gulch is being sent down rapidly and three shifts of men are at work. It is now down about 300 ft.

REVELLE.—This property, on Printer Boy Hill, is being developed again by lessees. The old tunnel is being driven in and some free-milling gold ore is being taken out. It is the belief that in conducting this work the lessees will open up a good ore chute.

TWIN LAKES SECTION.—Seventy-four sacks of ore were shipped from the Laester property this week to the Arkansas Valley smelter. Assays of the ore shipped gave as high as 2½ oz. gold, 25 oz. silver and 11% lead. The vein, which is from 2 to 3 ft. wide, carries a pay streak of from 3 to 14 in., and is improving every day. On the Terrible property a great deal of work will be carried on this season. They are at present working on a vein from 8 to 10 ft. wide, the character of the ore being a fine gold quartz, and the lowest assay of which returned 6.16 oz. gold while the best return ran something over 2 oz. gold. Besides this gold the vein also carries a good streak of lead ore which assayed 21% lead, 35 oz. silver and \$46 gold to the ton. A number of other Twin Lake properties will be on the producing list within a very short time.

WYVIAN MINING COMPANY.—These people control the Rock, Dome, Stone and '76 claims. The last is being operated under lease in the No. 2 shaft, down 60 ft., and in drifting they have broken into a nice body of lead carbonates, which assay well and from which shipments are to be made.

YANKEE DOODLE.—As announced in my special telegram last week, this property, on Carbonate Hill, has been sold to an Eastern syndicate, the sale, it is understood, being made by Mr. F. C. Kaye, of New York City. But few particulars have been learned since my dispatch. The mine is well located on Carbonate Hill, but outside of work done by lessees has not been extensively operated of late. It is developed by an incline and two shafts. The incline is 1,300 ft. long and the shafts are 200 and 450 ft. deep. Large bodies of iron and carbonates, it is said, have been opened up and the showing is a remarkably good one. Mr. P. W. Balcom, of Denver, represents the Eastern purchaser, while Mr. G. P. Goodier, of Leadville, has been made manager by the new owners, who have not yet incorporated. The rich strike made a short time ago in the William Wallace is certainly encouraging to the Yankee Doodle people, as it lies directly adjoining this property and is in the very heart of the silver-lead area.

MINERAL COUNTY.

BRISTOL HEAD MINING COMPANY.—The long-standing dispute between the Amethyst Mining Company and the Commodore Mining Company of Creede, over the Sunnyside mine, has been amicably adjusted. The settlement arrived at results in the organization of the Bristol Head Mining Company, with David H. Moffat as president; A. E. Reynolds, vice-president, and James A. McClurg, general manager. The territory in dispute, known as the Sunnyside mine, embraces 517 ft. in the center of the mining property owned by the Amethyst and the Commodore Company. Four years ago when it was not supposed that this little strip of vacant territory had any particular value, the two companies each secured a half interest in it by purchase. The purchase was made solely to protect themselves from any possible interference from outside parties. But as the Amethyst and Commodore workings progressed it soon became evident that the small extent of territory was the most valuable of all and that it contained the principal ore chute of the veins being exploited by the two companies. This discovery immediately threatened expensive litigation to determine which of the two should have the ore. About one year ago both companies began to develop the disputed territory, and it was this that made more imminent a legal fight. But six months ago an understanding was reached whereby the development of the disputed strip has been prosecuted along certain lines for the purpose of ascertaining what rights each of the two companies had. This work was recently completed, and the settlement that has been reached was based on the determination shown by the development work.

PITKIN COUNTY.

ARGENTUM-JUNIATA MINING COMPANY.—The annual meeting of the stockholders of this company was held at Council Bluffs, Ia., on June 8th, when the following board of directors was elected: R. J. Bolles, J. H. Bolles, H. K. Devereux, Geo. B. Lott, A. T. Jeffery, J. J. Hagerman and J. A. Haynes.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

ADELAIDE.—Colorado Springs capitalists have secured a lease and bond on this mine and will start active operations soon. The mine is near Gladstone and contains a large body of concentrating ore.

AGGIE.—Lessees on this property shipped their winter's product June 1st to the San Juan sampler, with the following result, after all charges were paid: Twenty-five sacks of first-class, 1,975 lbs., \$1,071; 36,600 lbs., second-class, \$156 per ton.

ARIADNE.—The force has been largely increased and some fine ore is being shipped.

COPPER KING.—Nelson Bros. have an 18-in. streak of quartz in the shaft, which samples 25 oz. silver, slight values in gold and 15% copper. Several hundred feet of work was done last season, and considerable ore was shipped.

DEEP TUNNEL.—This enterprise has again assumed a state of animation. Mr. C. F. Keely, the promulgator of the scheme, announces that he has succeeded in raising sufficient capital to carry it through, and will lose no time in beginning operations. The tunnel is to be run under Deer Park, with Silver Lake basin as its objective point. Ex-Governor Pattison, of Pennsylvania, is said to be one of the chief movers in the project.

GOLD KING.—Several of the piers are in place, and most of the lumber is on the ground for the new tramway to connect the mine and mill. The mill is running but one shift at present, owing to the lack of facilities for transporting the ore from the mine.

GREEN RIBBON.—Operations have been resumed with a large force of men and this old producer is again turning out ore. The mineral is of a silicious character and adapted to smelting purposes. The ore carries about 30 oz. silver, besides gold in small quantities.

HAMLET.—The output is 15 tons daily, which is being shipped to the Howardsville concentrator.

LAST HOPE.—This property has a vein of milling ore in the slope 12 ft. wide. The mill will be started in a few days.

LUCY.—Mr. Frazee, of Chicago, and Wilbur Thomas, of Denver, have instituted work on this claim. Although the vein is a large one, but little development has been done, the sum total consisting of a 30-ft. shaft and a 20-ft. tunnel. Both of these workings, however, have a 3-ft. vein of ore, averaging \$13 a ton in gold and silver.

M. E. HARRISON.—This property, in Ross Basin, which has been working a small force during the past winter, will shortly increase the number of its employees and commence regular shipments.

MYSTERY.—This property, near Red Mountain, will be started up as soon as the roads can be placed in condition for packing. A shaft was sunk which yielded handsomely from grass roots, but at a depth of 110 ft. the ore chute was lost owing to a fault. Eleven carloads of high-grade ore were shipped in sinking to that depth.

NORTH STAR.—J. J. Crooke has his new mill in first-class shape, and 25 tons per day are being treated, although the plant was supposed to have a capacity of only 18 tons. It is effecting a saving of 87% of the gross values.

PORTLAND.—This property is near the Gold King, above Gladstone, and is owned by Jackson & O'Driscoll. The tunnel, which is now in 150 ft., followed a large streak of low-grade ore from the adit, and a force of men is now breaking ore for early shipment.

REED.—Butler Brothers have opened up a good streak of ore in this property and are shipping regularly.

SAMPSON.—Judge Jackson Orr, of Denver, has asserted his intention of resuming operations on this property in the near future, and will himself superintend operations.

SILVER LEDGE.—Anderson and others are preparing to do considerable work during the summer. This mine has one of the largest bodies of milling ore in the county, but requires a mill to make it a profitable producer.

TOM TURNER.—This old property, above Gladstone, has been started up with a small force of men, who are engaged in cleaning out the workings preparatory to the addition of a much larger force.

WASHINGTON.—Mr. Malone and others are doing considerable work on this property with excellent prospects. A handsome offer to lease and bond was recently refused by the owners.

SAN MIGUEL COUNTY.

TOM BOY GOLD MINES COMPANY.—This company has purchased the iron mining claim in Savage basin from Gus Anderson for a consideration of \$11,000 cash. On the surface the lead of this property is about 150 ft. distant from and runs parallel to the Tom Boy vein. It is a large vein, but on and near the surface the ore matter is said to be badly broken up.

GEORGIA.

FLOYD COUNTY.

AMERICAN BAUXITE COMPANY.—The New York parties who recently contracted for the erection of a bauxite plant at Rome, have incorporated the above company with a capital stock of \$100,000 for the development of their property. Among the incorporators are I. N. Terry and Joseph Rudd, of Utica, N. Y., and H. L. Selleck, of New York City.

UNION COUNTY.

PRINCETON MINING COMPANY.—This company, of Princeton, Ind., has opened up a large vein of quartz on Coosa Creek, 18 miles from Blue Ridge, and has bought the Hunt mine at Young Harris, 15 miles north of Coosa Creek.

IDAHO.

ADA COUNTY.

ALEXANDER.—In sinking the first 10 ft. on this ledge ore was produced rich enough to pay all expenses and leave a little over as profits.

BLACK CROOK.—The tunnel is in about 150 ft. and has struck the ledge. From a test of the ore, it is claimed to be a concentrating proposition.

GOLDEN AGE.—This claim has two tunnels of 150 and 175 ft. in length, and both in a good grade of galena ore which is rich in gold but base. An additional force of men will soon be employed.

IDA.—Some of the ore from the lower tunnel run at the sampling works gave returns which showed an average of \$33 per ton.

RED BIRD.—This property has an 85-ft. shaft and a 125-ft. tunnel which open up a body of good-looking ore. It is the intention to sink the shaft to 100 ft. and then develop by crosscuts.

SUNRISE.—This is the west extension of the Black Crook, with the same size ledge and same character of ore. Crosscutting and development work is being done on the ore veins.

BLAINE COUNTY.

MINNIE MOORE.—About a dozen men are employed on the tailing dumps, and more will be put on right along as they can be worked to advantage.

BOISE COUNTY.

IOWA.—This mine, at Quartzburg, gives employment at present to 23 men. The clean-up of last month amounted to \$6,000. New hoisting works will soon be placed in operation which will greatly facilitate the working of the property.

ELMORE COUNTY.

DAISY.—At this mine, near Neal, there is 6 ft. of ore in the face of the drift that is being run on the vein at a depth of some 400 ft. from the surface. It is not high-grade ore, but there is a large body of it which is adapted to milling.

IDAHO COUNTY.

(From Our Special Correspondent.)

BANNER.—The hoist for this property has arrived in camp and will be put in position at once. Active operations, under the management of H. M. Glidden, are being carried on. This property will commence milling 1,000 tons of ore in a short time.

FLORENCE CAMP.—This camp, like all other Western camps, has its quota of wild cats, and they are being boomed for all that is in sight. But the properties which are being legitimately operated, have ore exposed which for quantity and quality cannot be excelled on the Pacific slope. Warren and Pierce City are showing up considerable ore bodies, and stamp-mills are being put in all over. The preparatory work on the Florence tunnel is well under way, but it is doubtful whether active work can be commenced before November. The actual depth at which the Florence Basin will be tapped will exceed 3,500 ft.

GOLD BUG.—This property is showing up better every day as development work proceeds. A large amount of \$40 rock is on the dump awaiting crushing, which will soon commence. A 10-stamp mill will be installed at once.

HIVU.—This property, formerly one of the largest producers in Idaho (under the name of the Washington), will soon be in a position to produce more ore than ever. Under the management of Homer King this property is being systematically developed with a large force of men. Sufficient ore is now exposed to justify a 10-stamp mill.

OZARK.—This property continues to produce high-grade ore. The shaft at present shows 2½ ft. of excellent ore. Two shifts are at work on the shaft and one shift on the lower tunnel. Under the management of A. Walker, this property is fast paying off the old encumbrances and will soon be on a paying basis. No ore has yet been milled except such as was extracted in development work, and it more than pays expenses. The mill has been entirely remodeled, and considerable new machinery added.

OWYHEE COUNTY.

DE LAMAR MINING COMPANY, LIMITED.—Mr. D. B. Huntley, the manager of this company's mine at DeLamar, reports as follows for the month of April: Crushed (wet), 4,260 tons; crushed (dry), 3,834 tons; average assay value of pulp, \$16.14, of which \$14.08 was gold and \$2.06 silver; average assay value of tailings, \$4.73, of which \$4.21 was gold and 52c. silver; total percentage saved, 70.69%; number Doré bars produced, 9; number ounces fine gold produced, 1,803.325; number ounces fine silver produced, 13,513.72; value of gold produced (at \$20), \$36,066.50; value of silver produced (at 60c.), \$8,108.22; ore sales, estimated, \$600; miscellaneous revenue, \$58.75; expenses for the month, \$32,747.74; estimated profit, \$12,085.73.

IDAHO & PITTSBURG MINING AND MILLING COMPANY.—The Black Jack mine, owned by this company, has been in continuous operation 4 years. It is under the management of Fred Irwin, and is employing about 90 men at present. They are now sinking a shaft starting from the 1,200-ft. level to open the mine to a greater depth.

MORNING STAR MINING & MILLING COMPANY.—This company's property near Silver City is under the management of Mr. David Adams. They have sunk the main shaft 100 ft. deeper and extended the 4th level north 100 ft. and now started the 5th level drifting north and south and still pushing and stopping in the fourth, getting out a good quality of ore in the slope. The ledge is showing well in the north and south. They are compelled for the present to stop sinking on account of water.

SHOSHONE COUNTY.

CONSOLIDATED TIGER & POORMAN MINING COMPANY.—The Tiger-Poorman mine, owned by this company at Burke, in the Cœur d'Alenes, shipped 1,980 tons of concentrates for the 27 working days in May. Its mammoth new plant is hoisting 400 tons of ore daily from the 1,100-ft. level. About 150 men are employed, and the mine and mill are working night and day. In the mine development work is well ahead. The main shaft, which is now down 1,200 ft., has a 14-ft. ore body.

INDIANA.

VERMILION COUNTY.

TORRY.—This coal mine, near Clinton, was destroyed by fire June 13th. Fifteen men were in the mine at the time, but they escaped by various passages. The loss is placed at \$50,000, with \$12,000 insurance. The coal company is a Chicago corporation, of which D. M. Bogle is president.

VIGO COUNTY.

VIGO.—This other mine at West Terre Haute, is being operated at a capacity of 4 tons per day. There is a great demand for the product of the mine, which is being run both day and night.

MICHIGAN.

COPPER.

FRANKLIN MINING COMPANY.—In the official report of Superintendent Graham Pope, under date of June 11th, the following is given regarding the Franklin, Jr., mine: "The fifth level is opened about 600 ft. south and 470 ft. north of shaft. On sixth level we are in 250 ft. north of shaft, and seventh level about 100 ft. The fourth level is about 300 ft. south and 250 ft. north. The drifts in fifth level are both showing fine copper. We have resumed the sixth level drift north. The sixth level drift is going into good lode. The stope is showing good stamp rock with some heavy pieces. The seventh level drift, going south, is in a good lode, showing fine stamp rock. The shaft is going down in a very good lode. The lode deposit back of shaft, in seventh level, shows some fine stamp rock; we will continue this drift until we reach the fork. We are now raising the shaft-house and getting along well. No. 2 shaft will be stopped June 15th for the timbering to begin. The rock blasted to-day was, as usual, of a good character and had a little fine copper."

INGHAM COUNTY.

There is every indication that the coal mines at Williamston will be reopened. Thomas Redfern, George M. Robson, Samuel Griffith and Joseph Franklin, of Pittsburg, Kan., have formed a partnership, and are sinking a new shaft. They will at present work only the top vein, which lies 18 ft. below the surface, is from 30 to 40 in. thick, and covers territory, as far as known, 1 mile in width by 4 miles in length, following the course of the river. At a depth of 45 ft. there is a second vein.

IRON—MENOMINEE RANGE.

ANTIONE ORE COMPANY.—Operations at the Traders' mine, owned by this company, have been resumed with a force of about 100 men, which will be increased later.

MANSFIELD IRON MINE.—At this property, says *Iron Ore*, the work of unwatering the old mine is still in progress. The water is below the back of the fourth level. On this level is a No. 12 Cameron pump, which was in use when the mine was drowned, so that the question of the condition of pumps and other machinery that have been under water in this mine for the past four years will soon be settled. All operations, except pumping, in the old mine are confined to removing the ore to the north and south of the pit left by the cave. There is a face of ore exposed about 50 ft. high and 20 ft. wide on each end. On the south they are stripping off the surface, which is about 4 ft. in depth, for a distance of 300 ft. On the 50-ft. level they are drifting this body and raising to the surface at intervals along the length of the drift. The intention is to begin at the south end of this drift and come back with the stope, leaving arches to support the walls until the ore on each side has been removed, when these arches will also be removed, thus enabling the operators to win practically all the ore. Operations on the north end of the vein are being carried out in practically the same manner.

MINNESOTA.

(From Our Special Correspondent.)

Ore shipments from Two Harbors last week were 34 vessels, averaging about 3,500 tons each. From Duluth in the 17 hours ending with Saturday midnight there were 40,733 tons shipped, the greatest record made on the docks of the Duluth, Missabe & Northern, or probably on any other road. Shipments over this road's docks are averaging considerably more than 20,000 tons a day. There is more demand for freight room, and the outlook for shipments from other lake ports is better than it has been at any time this season. The steamer *Crescent City* has just taken a load from Two Harbors of 4,954 gross, or 5,548 net, tons of ore, the largest taken out of Lake Superior.

Several diamond drill corps are at work in the northeastern corner of Minnesota in the iron-ore fields along the southern side of the international boundary, in Cook County, and are said to be meeting with favorable results. Surveys for a railroad to Grand Marais, the nearest available point on the lake shore where there is an excellent harbor, have been begun and will probably be completed this

year. The indications are that if iron indications prove as good as expected by those who are at work, there is to be considerable development thereabouts.

IRON—VERMILION RANGE.

PIONEER.—A despatch from Duluth states that "Thomas B. Arden, of Ashland, one of the managing directors of this mine, at Ely, is authority for the statement that the entire allotment of the Pioneer under the Bessemer ore pool, amounting to 225,000 tons, has been sold at about \$1 a ton, the highest price paid for Lake Superior ore this season. This sale insures the operation of the mine for the balance of the season. Shipments are being made direct from the shaft, the stock pile of 160,000 tons remaining untouched."

(From Our Special Correspondent.)

CHANDLER IRON COMPANY.—This mine is shipping about 90 cars of ore daily and is giving employment to some 400 men.

MINNESOTA IRON COMPANY.—This company is adding to its forces at Soudan hard ore mines, and now employs about 900 men there. It has made no change in wages since last season and does not expect to reduce this year. It is now hoisting about 2,000 tons a day and is loading some 3,000 tons more from stockpiles. It is stated that the company has made sales from all its mines, Vermilion and Mesabi, of about 2,000,000 tons, which is almost exactly its total shipments of last season. Two railway inclines are now being built by the company, one from Lake Vermilion to the summit of the hill on which are the mines, and the other from the coal docks to the engine-houses. The ground about No. 5 shaft is sinking, the pillars having been removed. The shaft is dismantled.

PIONEER IRON COMPANY.—This company is shipping some 50 cars of ore daily and is employing about 240 men. The newspaper rumor that it was under option at \$1,000,000 to the Minnesota Iron Company is denied at that or any other sum.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

JOPLIN ORE MARKET.—The output last week was about the same as the sales, and the shipment was but one carload less of zinc ore and one carload more of lead ore than the preceding week. Compared with corresponding period of last year, the sales were a gain of 20 cars of zinc ore and 2 carloads of lead ore. The top price paid was \$21.50 per ton for zinc ore, a drop of \$1 a ton from last week, and Friday there was a second drop of 50c. per ton. The high-grade Scotia and Tuckahoe ores were not sold. A few choice lots of lead ore sold at \$21.50, but the bulk of the ore sold at \$21 per 1,000 lbs. The corresponding time of last year zinc ore sold at \$21 per ton, top price, and lead ore closed the week at \$16 per 1,000 lbs. There is only a small surplus of lead ore in the entire district, and the surplus of zinc ore has been greatly reduced during the last four weeks, until there is only about 800 tons on hand. A. O. Ihlseng has bought about 1,000 tons of zinc ore, which will be sacked and shipped this week to Liverpool, England.

Following are the sales of zinc and lead ores for the week ending June 12th: Joplin zinc, 828,900 lbs.; lead, 216,100 lbs.; value, \$13,034. Carverville zinc, 1,042,720 lbs.; lead, 169,890 lbs.; value, \$13,932. Webb City zinc, 856,810 lbs.; lead, 48,830 lbs.; value, \$9,603. Galena zinc, 2,530,000 lbs.; lead, 501,710 lbs.; value, \$34,571. Aurora zinc, 630,000 lbs.; lead, 25,000 lbs.; value, \$4,250. Granby zinc, 297,500 lbs.; value, \$2,678. Alba zinc, 97,080 lbs.; value, \$1,027. Oronogo zinc, 75,760 lbs.; lead, 6,270 lbs.; value, \$896. Stotts City, zinc, 29,100 lbs.; value, \$306. District totals for last week: Zinc, 6,388,590 lbs.; lead, 967,800 lbs.; value, \$80,347. District totals for 23 weeks: Zinc, 140,984,600 lbs.; lead, 26,962,470 lbs.; value, \$1,882,227.

CHATHAM COMPANY.—They started up their two 16-in. pumps on the north end of their lease at Webb City and are lowering the water 4 ft. per shift and will soon have the water out so that operators can get into the ground.

GROUNDS & IRWIN.—They have purchased the Marion Cheney 80-acre tract for \$8,000. It lies west of the Scotia mines, and southward of Jackson Station. The ground was laid out into mining lots last week and several prospect shafts were started.

HULIN, BROWN & SIMPSON.—They have been cutting a new drift in their mine on the Moonshine land to shorten the run to the shaft from the face of the drift. They have a big face of rich ore to work on.

JACK POT COMPANY.—This company, on the Perry lease at Lone Elm, has about 15 tons of zinc in its bins, but the water is getting so strong that they will be obliged to put in a pump. The shaft is over 90 ft. deep.

MURDOCK, BRICE & DRYDEN.—They have started to work on their 10-acre lease east of Mound City plant, near Carverville. They have just put in a boiler and pump rig, having cleared out an old 164-ft. shaft, in the bottom of which there is pay dirt.

PORTER & STILLWELL.—They made a big strike on the Rex land adjoining the Butcher Boy mine. They think this strike will be as rich as the one they made a week previous.

SMITH, MUNSON & COMPANY.—This firm, operating the Center Valley mines, have commenced work again, as the water is sufficiently low so that they

can get into the drifts. They expect to produce 45,000 lbs. of lead ore this coming week.

MONTANA.

GRANITE COUNTY.

AMERICAN GOLD MINING COMPANY.—This company was incorporated recently, with a capital stock of \$65,000 by Oscar McKee and others of Anaconda. It proposes to operate in Granite and Deer Lodge Counties, making Anaconda its headquarters.

JEFFERSON COUNTY.

ALICE, MOLLIE AND IDA.—This group, near Winston, has been bonded by Frank Nevins to Victor Taft and the Lofgren Brothers. The shaft is down only 25 ft. The ore is pure galena, assaying, it is said, 74% lead, 72.3 oz. of silver, with a trace of gold. Taft & Lofgren Bros. will at once begin development work.

BIG & LITTLE CASINO.—This property, near Winston, better known as the Irish Syndicate, is under the superintendency of Fred Stoltz. The property is owned by Rooney, Maher & Roach, and is being operated under lease and bond by Kleinsmith Bros., of Helena, who are pushing development work night and day. They have a steam pump and whim hoist in operation, and are 200 ft. on the level from the shaft and raising to the surface for a permanent work shaft. They expect to break through very soon, and will put in a permanent work shaft 4½ by 6 ft., and about 50 ft. in depth.

MOCKING BIRD.—Drifting has commenced again in this mine at a depth of 150 ft. There are about 7 or 8 tons of ore on the dump, taken out during the sinking of the shaft. Three 8-hour shifts of miners are employed.

MADISON COUNTY.

MAYFLOWER.—All the miners employed at this mine, except the sinking crew, have been laid off owing to the fact that the ore chute pinched out.

MEAGHER COUNTY.

FLORENCE MINING COMPANY.—Owing to the continued fall in the price of silver this company has decided to decrease its working force and stop dividends.

PARK COUNTY.

HORR COAL AND COKE COMPANY.—A meeting of this company was held at Helena June 10th, when C. E. Conrad was chosen president and general manager to succeed his brother, J. H. Conrad, and it was given out that J. H. Conrad, on account of his mining in Arizona, would no longer continue his active connection with the company. The statement was authorized that the company expects to resume operations at the mines within a week. The following directors were chosen: C. E. Conrad, Capt. C. H. Palmer, J. A. Coram, Barton Sewall and James T. Stanford. The Horr mines have been closed ever since the recent strike. They employed, together with the coke works, about 300 men.

MONTANA MINERAL LAND DEVELOPMENT COMPANY.—Operations have been resumed at the Eva May mine, at Basin. About 40 men will be worked at present. The mine is equipped with a concentrator of 75 tons daily capacity, and has been developed to the 450-ft. level, where the ore body is said to show strong. The property has always worked steadily except during the spring months.

SAMSON MINING AND DEVELOPMENT COMPANY.—This organization is capitalized at \$500,000, with shares of a par value of \$1 each. The principal office is in Butte, Mont. The officers and directors are: Stephen Tredennick, president; L. S. Lahm, secretary-treasurer; J. H. Stinson and H. S. Potts. The properties of the company are the Samson, Lydia, C. C., the Rosa and U. S. Mint, all located in the New World District. N. J. Tredennick is the general manager. The prospectus of the company states that it is the intention of the company to develop and work these claims the coming season and a force of men sufficient for this purpose will soon commence work. This will consist of sinking shafts on both the Mint and Rosa, as shipping ore can be taken out from the time work is commenced. These shafts will be continued to a depth of 200 ft., when levels will be run and the shafts connected. The shafts will be 400 ft. apart. As soon as circumstances will permit a working tunnel will be started on the Lydia, which will also tap a number of the surrounding mines, some of them at a depth of 800 ft.

NEVADA.

ESMERALDA COUNTY.

(From Our Special Correspondent.)

BLAIR GROUP.—These mines, that were famous 30 years ago, and are located in Silver Peak, are reported as sold to a strong syndicate, composed of J. B. Haggin, Marcus Daly, J. B. Canda, of New York, son-in-law of the late owner; John I. Blair, John W. Mackay and George Roberts, for \$1,000,000 cash. With the title to the mines goes a law suit, planted by L. J. Hanchett, who had a lease and bond on the property, and, failing to get it renewed, attempted to withstand the Haggin-Daly experts with force. For years the property has been worked only under lease, one lessee, John Chadwick, having milled 10,000 tons, recovering \$15 in the mill and afterward obtaining \$6.50 per ton from his tailings by cyanide. Another lessee worked 1,900 tons, saving \$21. The mine is a huge quarry, the ledge said to be over 100 ft. thick and averaging \$7.80 in gold. Through the

main quartz body are two parallel veins of richer stuff, one 15 ft. and the other 25 ft., and it is from these that the lessees have taken their ore. Mr. Hanchett, during his bond, carried his ore to water 12 miles distant, part of the way on burros, and the operation was expensive. George D. Roberts secured title to all the water in the neighborhood, and also to a portion of the waters of Fish Lake, prior to the consummation of the sale, for John W. Mackay, hence, whatever the outcome, he holds the key to the situation. A pipe line 30 miles long is to be constructed, which will furnish water-power for mills and dynamos. The initial battery to be erected by the new owners is to be of 100 stamps.

UREKA COUNTY.

(From Our Special Correspondent.)

Negotiation is pending for the transfer of a mine on Prospect Mountain—substantially a gold-bearing property—to California people, but no particulars can be given at present.

ADAMS HILL PROPERTIES.—Parties are expected here about the last of June to examine and report on the Barton & Altoona and Oriental & Belmont mines, situated upon Adams Hill. These properties have produced gold and silver to the value of about \$200,000, and are under bond to a Louisville, Ind., company, which will conclude a purchase, and set up machinery to sink a shaft and carry on exploration to a depth of 500 or 1,000 ft. if the mines suit them. No work has been done on them deeper than about 100 ft.

PATROON GOLD MINING COMPANY.—This company, of Saratoga, New York, has organized to do a general mining business here. They are driving a tunnel to open a mine in what is locally known as the Hamburg limestone belt. The property is situated midway between the Jackson and Dunderberg mines and has good prospective possibilities. The tunnel is being driven under contract and supervision of Mr. John Hageman, the manager of the company.

STOREY COUNTY—COMSTOCK LODE.

CROWN POINT MINING COMPANY.—At the annual meeting in San Francisco last week, 69,629 shares were represented, and the old directors and officers were re-elected without opposition, as follows: C. L. McCoy, president; James Newlands, secretary; J. P. Martin, Thomas Anderson and James Newlands, Jr., directors. H. M. Gorham was reappointed superintendent.

NEW MEXICO.

GRANT COUNTY.

COPPER KING.—The Apache camp, in the Little Hatched Mountains, in the southern portion of the county, was in the early eighties a good producer of lead and copper ores, but the mines have been for some time dormant. About two months ago Weems & Anderson took a lease upon the Copper King mine. With a small amount of development work they uncovered a large body of ore. With 12 men they are making regular shipments ranging from 160 to 200 tons per month.

GOPHER.—J. D. Weems, one of the owners of the lease on the Copper King, has purchased from Gleason & Anderson one-third interest in this mine. Work was started at once and the mine has already become a producer. The ore body is from 6 to 16 ft. in thickness.

GUADALOUPE, OXIDE AND CHINO.—At Santa Rita J. B. Gilchrist has 30 men working upon these mines. On the Guadalupe the new Gilchrist shaft is down about 70 ft. and shows a 3-ft. vein of ore which runs 24% copper.

WESTERN BELLE MILL.—The building for this mill has been completed and the machinery is being placed in position. On account of the scarcity of water in the vicinity of the mill and mine two 20-H. P. gasoline engines will furnish the power for mine and mill.

SOCORRO COUNTY.

CONFIDENCE.—At Mogollon the main adit level on this mine is in 1,524 ft. The ore body in the breast of the tunnel is over 4 ft. in width, and is of much higher average grade than the ore mined during the past year. This new ore body in the breast of the main level is directly under a big outcrop of ore of the same grade which shows in an open cut upon the same surface.

COONEY.—Another strike is reported on this mine. Schaible, Cooney, Freeman and Jerry Bradd, lessees of this mine, have, at 55 ft., struck a peacock base ore, high in copper.

TAOS COUNTY.

EDISON.—This mine, on Bitter Creek, 7 miles north of Red River City, is now being worked by a large force of men, and a mill to treat the ore will soon be on the ground.

KEYSTONE MINING COMPANY.—This company has four men at work, continuing its tunnel to reach the extension of the Edison lead, and expects to reach it at a depth of 600 ft.

MIDNIGHT.—This mine, lying one-half mile west of the Edison, has 20 men continuing work on its shaft, which is now 175 ft. deep. Two levels have already been run on this property and a large body of good ore is on the dump.

NEW YORK.

POTNAM COUNTY.

TILLY FOSTER.—These iron mines, near Brewster, have been closed for an indefinite time with a large

quantity of ore lying on the dumps. A rich vein of iron ore had just been struck, but the price of iron is so low that it could not be worked at a profit.

OHIO.

MINERS' WAGE CONFERENCE.—A conference of coal operators and Ohio miners was held in Columbus June 15th, on the mining rate. The operators were represented by M. D. Woodford, president of the Wheeling & Lake Erie Railroad, and the miners by National President Rachford and State President Farms. The operators insist upon the enforcement of 9c. differential, which would make the rate 45c. a ton, as they claim that the bulk of the coal produced in the Pittsburg District is mined at 54c. The miners refused to accept the proposition of the operators, and a strike may be ordered.

OREGON.

BAKER COUNTY.

OREGON GOLD MINING COMPANY.—James Ferguson, W. E. Grace, W. McCarty, Joseph McKay, Joseph Manaudas, M. S. Foss, N. E. Inhans, J. R. Burns and John L. Rand have incorporated this company, with an office in Baker City and a capital stock of \$100,000 divided into shares of \$1.

DOUGLAS COUNTY.

A. B. C. COMPANY.—John Addison, of Chicago, president of this company, which now owns the Victory mine near Glendale, is on the ground superintending the construction of new ditches. He has a corps of engineers surveying a 24-mile ditch which will tap Perkins, Rattlesnake and McCulloch creeks, which will furnish water for the entire year. Forty men are doing the work of excavation.

GRANT COUNTY.

ASHLAND.—The shaft on this mine is now down over 200 ft. The ore which runs high is being shipped. Work is being done by contract.

HENRIETTA.—A tunnel 120 ft. in length has been run on this property. The vein is over 60 ft. in width.

HILL MINE.—In T. W. Hill's cinnabar mine the extent of this vein has never been ascertained. A crosscut tunnel, 75 ft. in length, has been run and but one wall found. A shaft 100 ft. in depth has been sunk on the vein, showing a fine body of cinnabar and gold ore. The average samples of cinnabar are said to run from 1 1/2 to 7% and the gold \$2 per ton. Native quicksilver can be panned in several places.

LITTLE PITTSBURG.—A crosscut tunnel is being run. The vein is in porphyry and granite, and mills over \$20 free. The concentrates run high. The owners are Garvin and Illingsworth.

LYNCHPIN.—The shaft is down 117 ft. and a body of ore over 8 ft. in width has been encountered. From the surface to a depth of 169 ft. the vein was small, assaying \$38 in gold, \$44 in silver and \$145 in pyrites. It is the property of Russell, Gendar and West.

MARY JANE.—A tunnel over 300 ft. in length has been run to crosscut the vein. On this property are two shafts over 70 ft. in depth, showing an average width of ledge of 3 ft. that carries base ore, assaying from \$32 to \$58. This is the property of H. L. Hatch.

RED BOY.—The owners of this group, in the Granite District, have purchased a sawmill to get out timbers and lumber for a new 20-stamp mill building, which they will install as soon as possible. At present they are crushing but 8 tons of ore in a Crawford mill, yet the ore is good enough to pay for all dead work and new machinery to the plant. They are running a 1,000-ft. crosscut tunnel to cut the Golden Monarch and Red Boy veins some 400 ft. below the upper workings.

SHORTY-HOPE MINING AND MILLING COMPANY.—This company lately made a thorough test of their ore. A ditch is to be built to give power to run the 15 stamps that are to be added. The vein varies from 3 to 8 ft. in width, and is in quartzite and porphyry contact.

JACKSON COUNTY.

COAST RANGE MINING COMPANY.—This company, of which W. H. Payne is manager, is preparing for extensive placer mining operation on the Stidham bar, about two miles below Woodville, on Rogue River. A 225-H. P. engine has been received from Portlar, which will immediately be adjusted on the company's property, after which operation will commence.

PENNSYLVANIA.

ANTHRACITE COAL.

The committee appointed by the Pennsylvania Legislature to investigate the condition of the miners in the anthracite regions presented its report on June 14th. "The testimony taken," says the report, "shows conclusively the deplorable condition of affairs for a period covering about two years, and particularly since January 1st of the present year, since which time the men in and about the collieries have been employed not more than two or three three-fourths days per week, earning on an average about \$4 per week, upon which, in many instances, they are compelled to support large families. The greatest destitution and want is found in Mahanoy City and its vicinity, Shenandoah and its vicinity, Hazleton and its vicinity, Shamokin and its vicinity and Wilkes-Barre and its vicinity."

The report then goes on to say that it seems that the wages now paid are upon the basis agreed upon by the operators and the miners as far back as 1875. The committee says that "the manner or custom of regulating the wages certainly appears to be one which shows a strong disposition on the part of the employers to treat labor fairly."

"The committee especially inquired into the subject of company houses," the report continues, "and found in all cases that the houses were roomy and comfortable, and that the rents charged were not in excess of those charged by individuals for houses of the same character in the villages and towns adjoining."

The committee also inquired into the causes which have brought about the present condition of affairs, and although numerous reasons were advanced, the majority of witnesses thought it due to the depressed condition of the business throughout the country. "The surplus labor in and about the mines," asserts the report, "contributes largely to the present condition of affairs."

Speaking of the foreigners working in the mines, the report says: "Non-English speaking miners and laborers, with English-speaking superintendents and foremen, must necessarily produce trouble and render the miner more liable to accidents. The committee is of the opinion that there will be no general prosperity in the anthracite regions until Congress shall have passed a restricted immigration law."

It was charged that the high price charged for coal at tidewater, thus decreasing the consumption, was the cause of the deplorable condition of the miners, but the committee say, that for a number of years none of the coal companies, save one, have declared dividends. Upon the question of freight rates the committee is of opinion that the rates charged are not greater than those charged for other classes of freight.

The committee makes these recommendations: 1. The enactment of a law abolishing company stores; 2. The prohibiting of discounting or negotiating money orders belonging to the miners; 3. The enactment of a compulsory semi-monthly pay law; 4. The repeal of the Miners' Examining Law and the enactment of a law providing for a State Board of Examiners and that certificates issued by the board shall entitle holders thereof to be employed in any mine in the State; 5. The enactment of a law providing for the appointment of an inspector of coal, to examine the coal as it comes from the mines; 6. The passage of a resolution requesting Pennsylvania representatives in Congress to vote for and urge the passage of a law restricting foreign immigration.

CANAVAN COAL TRACT.—Negotiations have been completed for the lease of 70 acres of this tract in the Tenth Ward of Scranton and the southeastern part of Dunmore, and according to agreement a colliery will be in operation there within six months' time. The breaker will be located between the Delaware, Lackawanna & Western and the Erie & Wyoming Valley railroad tracks. The shaft will be sunk 500 ft. Three veins will be worked in co-operation, one of these being 8 ft. thick of the best coal. The new company consists of John G. Gilligan, formerly foreman at the Richmond colliery; Patrick McNulty, inspector of the Pennsylvania Coal Company; Anthony McHale, foreman of the Nay Aug Coal Company, and Philip Hastings. Operations will be begun at sinking the shaft on July 1st.

WORKING SCHEDULE.—An order which is so general as to include about all the large operating companies in the upper valley of the Lackawanna, and which has put the mines on a five-day per week schedule, has gone into effect. The working average has been but two or three days per week. The Delaware, Lackawanna & Western collieries are all included in the order. The Delaware & Hudson mines will work about four days a week for three weeks, when the time will be increased to five days.

TEXAS.

MAVERICK COUNTY.

DOLCH.—J. B. Dibrell and M. Mosheim, of Seguin, and Louis F. Dolch, of Eagle Pass, have about completed arrangements for the extensive development of these coal mines.

UTAH.

(From Our Special Correspondent.)

A useful and novel idea is presented in *The Prospectors' Map of Utah*, just issued in the form of a folder by the Rio Grande Western. All the mining districts of record in the surveyor general's office, with their correct boundaries, are shown, and on the back of the map is a concise story of the achievements of the prominent regions. It cannot fail to prove of use to mining men generally, and the idea should be carried out for other States. This is not the first instance where the Rio Grande Western has taken the lead in effectively directing attention to the mining resources of the Rockies.

OUTPUT FROM THE LARGE SHIPPING POINTS.—Production continues to show a falling-off in all the old reliable silver-lead camps, particularly Bingham, Park City and the three Tintic towns. Although there are generous ore reserves opened in these different localities, the danger line between profit and simply mining to furnish men employment, to supply rail traffic and forward desirable products to smelters is reached. When silver dropped below 60c. an ounce the last straw was

added. Utah has vast stores of silver-lead mineral, which is greatly needed by smelters beyond the State that will not be marketed—save sparingly—until existing conditions have had a thorough overhauling and equitable readjustments been made. The mines cannot longer be taxed in the way they have been in the past, and, until this is fully appreciated and acted upon, the tonnage from Utah's camps will steadily diminish. Are the railroads, the smelters and others so blind that they cannot read the writing on the wall?

RECORDS OF MINING CLAIMS.—Thursday, June 10th, was the last day of grace for recorders of the different mining districts to deliver their official archives to the county recorders at the county seats of the counties where the districts are situated. So far as can be learned the provisions of the law passed last winter by the second general assembly have been quite generally complied with. In two instances there was a slight complication, where a district overlapped from one county to the adjoining county, as to which county recorder was the proper custodian, a confusion liable to occasion further annoyance. Several of the boards of county commissioners failed to make provision for transporting the records from the various districts to their respective county capitals, as the statute provided, but nothing further has been mooted of the instituting of legal proceedings to contest the constitutionality of the law in the courts. In brief, it can be said that the organized threatened opposition is at an end, and hereafter all records of mining claim locations will be at the county seats in which the claims are situated.

SHIPMENTS FROM SALT LAKE.—For the week ending June 12th there were shipped East 39 cars, or 1,399,435 lbs., lead-silver bullion; 2 cars, or 92,540 lbs., copper bullion; 45 cars, or 857½ tons, lead-silver ore, and 1 car, or 23¼ tons, argentiferous slag.

BEAVER COUNTY.

(From Our Special Correspondent.)

HORN SILVER.—Manager P. T. Farnsworth went to Denver last week. The report sent out of the closing of the mine is entirely without foundation. There is no particular change underground and so long as there is a reasonable profit work will continue as at present.

INDIAN CREEK GOLD MINING AND MILLING COMPANY.—The Golden Fleece, Farr Fraction, Alaska, Alaska Extension, Ute, Eagle's Nest, King Solomon, Defender, Rival, Kangaroo, Australia and Vigilant, in the Newton mining district, form this group of claims; capitalization, \$3,000,000; divided into \$10 shares, with 100,000 shares in the treasury. C. W. Miles is president, Thomas Ferguson vice-president and manager, H. Elsemann secretary treasurer. President Miles went to Indian Creek last week to direct the exploration under way on the ground, where a quartz ledge in porphyry is found to carry \$8 to \$17 gold. There are several strong veins, the worth of more than one of which will be tested this season. It is said the main vein is 30 ft. thick, from which assays have returned \$4 to \$456 gold and 3 to 947 oz. silver. Since the recent activity in Gold Mountain, just east of the Beaver County boundary, the Indian Creek region is rapidly coming into favor.

DAVIS COUNTY.

(From Our Special Correspondent.)

PROSPECTORS' GOLD MINING COMPANY.—Inquiries are being again made for information of the prospectors and an outline sketch of the company may prove of interest to others. Certificate of incorporation was issued February 24th, 1896; capitalization 500,000 shares, par value \$1. Incorporators, William Munro Howat, Hugh Craney, James E. Mosley, Brigham Mikessell and Mayo Lee Perry, all of Salt Lake. None are known in the mining world and the city directory designates them "laborers." The realty consists of the Philadelphia lode claim in Bountiful Mining District, Davis County. From this neighborhood sensational stories of rich gold finds were sent abroad, though no ore of moment has been discovered. Only surface cuts and shallow holes are to be seen; the property is idle and the little work done was not directed by skilled mining men. About two months ago a machinist of St. Louis wrote to the Chief of Police of Salt Lake for information of the company, stating that a man had been through the shops there selling a goodly number of shares. One of the incorporators says that stock has been sold in Pittsburgh, Philadelphia, Belfast (Ireland), and elsewhere for 10c. a share, or at a valuation of \$50,000 for the property—possibly it might be sold for \$350.

JUAB COUNTY.

(From Our Special Correspondent.)

AJAX MINING COMPANY.—What is liable to prove a valuable uncovering of ore was made a few days ago at a depth of 350 ft. in virgin ground. A sample from a 4-ft. face showed 43% copper. The extent of the chute is being determined. Manager Henry M. Ryan states that no more Ajax mineral will be handled at the Sioux mill before August. The company is considering the best method of treating its different grades of ore.

HOMESTAKE MINING COMPANY.—At a special stockholders' meeting a week ago, every share being represented, it was unanimously voted to make the stock assessable, with the proviso that no single assessment exceed 1c. a share and not more than four in any one year, or a maximum in 12 months of \$16,

000. Directorates will levy first assessment so soon as legal formalities can be complied with, and exploration will be resumed in July. The five claims composing the realty have passed the 60 days' publication for patent, with but one small adverse filed. All in all the forecast is rosy, as the property is an alluring one, big with promise.

LOCAL SITUATION.—In its review of the week the *Tintic Miner* is of the opinion that bottom is reached and from now on there will be a steady improvement. This is the best of good news if it should prove true. There are unmistakable signs that the project of establishing a smelter is under serious consideration. Natural conditions favor the move, as everything is at hand save fuel and an abundant cheap water supply, but opposition from railroads and established smelters is to be counted on. Possibly this has not a little to do with the improved outlook. Tintic is a remarkable metalliferous region, sure of a long life, and it is a safe prediction that it will not remain under a cloud for a considerable period.

ORIENT.—In addition to the silver-lead vein that recently brought to light a seam of lead carbonates, a second vein is exposing ore carrying \$10 to \$18 gold, 35 oz. silver and 20 to 30% copper. This latest find was at the surface. The Orient is in West Tintic.

SIoux MILL.—After a shut-down of a few days the mill is now handling ore from the North Star, also from the Sioux and Utah. There seems no reason to question but that there will be an abundance of custom work to keep the plant going the remainder of the season.

TINTIC SHIPMENTS.—For week ending June 12th: Bullion Beck, 20 cars ore; Centennial-Eureka, 3 cars ore; Eureka Hill, 12 cars concentrates; Uncle Sam, 6 cars ore; Mammoth, 6 cars ore; 7 cars concentrates; Carisa, 4 cars ore; Swansea, 4 cars ore; South Swansea, 3 cars ore; North Star, 3 cars ore; Joe Bowers No. 2, 1 car ore; Domingo, 1 car ore; Luzerne, 1 car ore.

PIUTE COUNTY.

(From Our Special Correspondent.)

BRECKENRIDGE-MAMMOTH.—A well-situated compact tract of about 190 acres, beyond the Surprise, in Gold Mountain District, is being exploited under the direction of Manager James Long, Jr. On the face of a steep mountain side are croppings of two distinct quartz ledges, possibly others, prospected by open cuts, a tunnel and drifts showing alluring gold values. On May 17th a main working cross-cut tunnel was started, now in 125 ft. in decomposed porphyry wash. Tunnel is 4 ft. 6 in. by 6 ft. 4 in., well timbered, straight, by far the most miner-like working in the district. One vein is liable to be cut at 300 ft. and what was first supposed to be the back vein at 700 ft. or more; affording 150 to 300 ft. vertical height above the tunnel's horizon. Both the Sevier main veins and those in Surprise ground cross the Breckenridge-Mammoth. Manager Long has secured valuable water rights, not the least important feature of this promising mining venture.

STANDARD MINING AND MILLING COMPANY.—On June 12th the articles of incorporation were filed; 350,000 shares, par \$1. Officers and directors: Michael Hennessy, president; Patrick Holland, vice-president; A. M. Bartholdi, treasurer and manager; Francis M. Houghy, secretary, and Valentine Kraemer. The president and secretary reside at Marysville, the others at Eureka. The claims are: Standard, Standard No. 2, Black Jack, Jennie Maud, Osso, Gold Medal, Gold Medal No. 2, Mountain Lion, in Ohio District. Systematic prospecting is in progress.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

BINGHAM SHIPMENTS.—Tonnage for May was 3,599, a light output. The four largest contributors to this total were Old Jordan & Galena, 1,400; Old Telegraph, 697; Dalton & Lark, 420, and the Fortune, which but a year ago was a prospect, furnished 200 tons.

DALTON & LARK GOLD, SILVER AND LEAD MINING AND MILLING COMPANY.—On June 10th, at Salt Lake, the annual meeting of this company was held. Of the 2,500,000 shares there were said to be 2,417,076 represented. The following officers and directors were chosen for the current year: J. Schenk, president; H. H. Rea, vice-president; J. H. Bacon, treasurer; James K. Schenk, secretary; W. S. Henderson, J. M. Rea and David Schenk. At present only a small force is employed, and from the vast reserve just sufficient ore is mined to meet the requirements of the pay-roll. Something of moment may be looked for from this company before the end of summer.

NEW STATE MINING AND MILLING COMPANY.—Little Cottonwood gives signs of returning activity. The New State Company owns two patented claims at the mouth of the canyon, where a rich paying seam is opened. This is 4 to 8 in. thick, carrying over 20% copper, 3 oz. silver and \$40 to \$120 gold. The copper content was a surprise, as it was entirely unexpected. Shipments will soon be in order. The capitalization is 150,000 shares, par \$2. R. P. Morris is president; W. J. Wolstenholme, vice-president and manager; G. A. Gibbs, secretary-treasurer, and M. C. Morris and B. F. Redman complete the directorate.

TOOELE COUNTY.

(From Our Special Correspondent.)
BRICKYARD.—Last week ore was taken from this

ground to the Golden Gate test cyaniding mill. The several grades of mineral will be thoroughly experimented on. Again it is rumored that Captain De Lamar has an option on all shares not owned by him and whisperings of a big deal, embracing the Gold Dust, are in the air.

CAMP FLOYD RECORDER.—On Saturday, June 5th, was held the annual election for recorder of the Camp Floyd Mining District. Recorder Higgins, who has served for three years, moved that the secretary cast the vote of all present for J. F. Connor, who, accordingly, was unanimously chosen for the ensuing year. It is probable Recorder Connor will have little to do. A move is on foot to have a certified copy of claim records for use in this district, but, as from now on the only legal record of claim locations is the one at the county seat, the office of district recorder can be maintained in its usefulness only through old-time sentiment. This cannot long continue; for most locators will pay but one fee—i. e., the legal one to the county recorder—for having their claims recorded.

GEYSER-MARION.—The pioneer Marion mill is closed. This does not indicate a falling off in output, for the contrary is true. Increased tankage is being put in at the Geyser mill—a more modern plant—where 100 tons daily are treated. At the Marion mill the dump has about reached its limit; extending well into Mercur town. Physical condition of mine is excellent.

HERCULES.—The tunnel by which it is proposed to cut the Northern Light ore chute on its dip is in over 200 ft. It is expected the face will be in mineral within 50 ft.

MERCUR.—Since the mill rebuilding and enlargement all moves smoothly, from 280 to 300 tons are handled daily and already additional tanks are being added—a further capacity increase. Shortly this cyaniding plant can be scheduled at 350 tons in 24 hours, which tonnage the reserves can supply for an indefinite period.

SILVER STATE MINING AND MILLING COMPANY.—On Wednesday of last week this company was a year old and at the first annual meeting these officers and directors were chosen: G. W. Snow, president; H. J. Hayward, vice-president; Fred Lyon, secretary-treasurer; Joseph Pugsley and R. P. Morris. The capital stock is \$100,000; shares par \$1. Uncle Joseph lode claim, in process of patenting, in Ophir District, is the realty, though the company has a bond on Magnolia East and Magnolia West, two adjoining claims, and has recently located the Aztec. Exploration is under way on Uncle Joseph. The ore is silver with some gold values.

SUNSHINE.—Some small stir is occasioned by a lead-silver ore seam about 50 ft. above the gold zone. This is not a new find, as it was uncovered over a year ago in digging a posthole for the telephone line, though its worth is just being tested and it is a very pretty showing for so near the surface. The mineral is good grade galena; quantity as yet undetermined. Nothing is given out as to resuming operations on the gold ore body and mill.

WASHINGTON.

(From Our Special Correspondent.)

PRESCOTT PLACER DREDGING COMPANY.—This company has been organized by C. H. Prescott, S. G. Maxwell and Louis D. Campbell, incorporators, to use the Bowers Dredge to excavate the beds of the various rivers on the Pacific Coast for gold deposits. Operations will begin in Oregon.

KING COUNTY.

According to the *Spokesman-Review*, it is reasonably certain that Seattle will be selected as the location for the smelter and refining plant which a syndicate of Milwaukee, Salt Lake and Portland capitalists is about to establish in the Northwest. The authorized agents of the syndicate submitted a proposition to a citizens' committee, substantially as follows: That Seattle donate a ground site, easy of access and near to the water front of the city, of 20 acres, and her citizens subscribe for \$100,000 of stock in the concern, to be paid for only after the plant is established. This much is to be done by the citizens in lieu of the construction of a smelter and refinery to cost \$375,000, the management to have in addition a bank account or working capital of \$300,000. The smelter shall have a capacity of 400 tons per day. The smelter people have been given to understand that their terms as submitted in the original proposition will be complied with. It seems to be generally understood that the site of the smelter and refinery will be on the tide flats between the city and Ballard, a suburb of Seattle.

STEVENS COUNTY.

CLYDE-MOHAWK MINING COMPANY.—This company, which commenced work one month ago near Bossburg, has driven the shaft on the Clyde to a depth of 20 ft. The ore thus far developed is charged with iron and copper pyrites, with oxide of copper coming in. The width of this vein has not been determined. Superintendent J. F. Rice, of Spokane, is pushing the work with three shifts.

LE BON GOLD MINING COMPANY.—This company, controlled by Messrs. Cheney, Grote, McNace and other Spokane parties, is establishing a camp on Toulou Mountain for the purpose of prosecuting development work on the Black Knight & Warrior claims, recently acquired by this corporation.

LITTLE GIANT.—At this mine a force of eight men is working in the 80-ft. shaft, and the crosscut at the

70-ft. level is in 20 ft. Over 300 ft. development work has been done on the property, and it is reported that shipping ore has been encountered in every opening made. More than 300 sacks of ore, that it is claimed will run an average value of \$100 per ton in gold alone, have been stacked up for shipment. The 10-H. P. steam hoist has been placed on the property, and the mine is now producing each day about 5 tons of shipping ore from the 2½-ft. vein in the deepest shaft. Freight outfits coming empty from Grand Forks to Bossburg and Marcus have arranged to carry the ore to railway transportation for \$5 per ton.

WYOMING.

CARBON COUNTY.

ELDORADO.—J. S. Watkins reports that he has opened up a 25-ft. lead on this mine, on Cooper Hill.

FREMONT COUNTY.

ROCK SPRINGS COMPANY.—The incorporators of this company, recently organized, are: John B. Zeigler, W. H. Mellor, A. J. Matthews, Robert Smith, Otto Nelson, O. A. Hamilton and C. A. Snyder. John B. Zeigler is president, and Robert Smith, A. J. Matthews and W. H. Mellor, directors. The company will operate principally in the Sweet-water mining district.

JOHNSON COUNTY.

An investigation by experts of the coal measures on Piney Creek, near Buffalo, has resulted in a number of findings being made by Messrs. Bedford of Omaha, Hemingway, Stotts and Rogers of Sundance. The coal is semi-anthracite, and is believed to be equal to the Newcastle coal of Weston County.

LARAMIE COUNTY.

HORSE SHOE PARK.—Reports received from these prospects near Wheatland, where Messrs. Johnson and Hammond have been developing claims, show them to consist of silver-bearing galena. A vein 2 ft. thick is being worked and ore taken out for a trial shipment to Denver.

FOREIGN MINING NEWS.

AFRICA.

TRANSVAAL.

NATIVE LABOR ON THE WITWATERSRAND.—The Johannesburg Chamber of Mines and the Association of Mine Managers lately agreed upon a schedule of wages for native laborers, to take effect June 1st. The rates are an average reduction of about 30% from the old wages, and the immediate result was that many natives left the mines, though it was believed that most of them would return. The schedule is given below; in reading it one must remember that in the Transvaal "boy" means a native laborer, no matter what his age. The shilling may be taken at 2c. and the penny at 2c. The company furnish quarters and food of a very simple kind.

Mine.—Machine helpers, 1s. 8d.; hammer boys, 1s. 6d.; shovel boys, 1s. 3d.; tram boys (10 feet trucks), 1s. 2d.; tram boys, (16 feet trucks), 1s. 6d.; dry shaft and winze boys, 1s. 8d.; wet shaft boys, 2s.; wet shaft boys (when developing only), 2s. 6d.; boys cutting hitches for timber, 1s. 6d.; timber boys, 1s. 2d.; stope ganger's assistants, 2s.; station boys, (where white men employed), 1s. 2d.; station boys (where no white man employed), 2s. 6d.; air-hoist drivers, 2s.; pumpman's assistants, 1s. 8d.; platelayers' assistants, 1s. 6d.; pipe-man's assistants, 1s. 6d.

Surface.—Stokers (12 hours), 2s. 6d.; stokers (8 hours), 1s. 8d.; engine cleaners, 1s. 6d.; sorting boys, 2s.; headgear boys (where white man employed), 1s. 4d.; headgear boys (where no white man employed), 2s. 6d.

Mill.—Elevator boys, 2s.; vanner boys, 2s.; mill boys (12 hours), 2s.; mill boys (8 hours), 1s. 4d.; blanket and sluice boys, 2s.; crusher boys, 1s. 4d.; surface trammers, 1s. 9d.; mule drivers, 2s. 6d.

Cyanide.—Solution shed boys, 1s. 4d.; boys (filling and discharging), 1s. 9d.; zinc cutters, 1s. 6d.; tramming residues, 1s. 4d.

General.—Fitters' boys, 1s. 6d.; blacksmiths' boys (strikers), 2s. 6d.; blacksmiths' boys (helpers), 1s. 4d.; carpenters' boys, 1s. 2d.; masons' boys, 1s. 4d.; police, 2s. 6d.; compound cooks, 2s.; drill packers, 1s.; drill sorters, 1s. 6d.; surface laborers, 1s. 2d.; office and store boys, 2s. 6d.; assay office boys, 2s. 6d.; coal boys (off-loading), 1s. 6d.

Notes.—Timber boys assisting in timbering shafts to be paid at the rate of wet and dry shaft boys. Not over 7½% of the natives employed may be paid special rates. The month is to be reckoned as consisting of at least 30 working days.

AUSTRALASIA.

NEW ZEALAND.

WAIHI GOLD MINING COMPANY.—The report for the year 1896 states that 34,410 tons of dried ore were treated, producing 100,720 oz. of bullion; 2,522 tons of tailings were also treated, producing 2,275 oz. of bullion. This bullion realized in London £137,344, and after adding sundry receipts the total gross revenue amounted to £135,329. The expenditure in New Zealand and London amounted to £58,684, leaving a net profit of £76,645. This added to £13,677 brought forward makes a total of £90,322, out of which the directors have paid dividends amounting to £64,000, being equal to 40% on the share capital (tax free), and a balance of £22,752 has been carried forward.

QUEENSLAND.

Mr. P. F. Sellheim, under-secretary of the Mines Department, furnishes the statement of gold production for the month of April, which shows a total of 64,223 oz. Of this 2,000 oz. were from alluvial or placer workings, and 62,223 oz. from quartz mines. The total ore reported worked was 52,709 tons, giving an average yield of 1.2 oz. per ton. The Charters Towers District leads, with a total of 28,935 oz., the Mount Morgan coming second with 13,055 oz. For the four months ending April 30th the yield is reported at 232,094 oz. in all.

WESTERN AUSTRALIA.

GOLD EXPORTS.—The London *Economist* says: "It is to be regretted that at present the statistical information regarding the results obtained from the Westralian mines is of a very incomplete character; but taking the official figures of the gold entered for export, it is satisfactory to find in them evidence of considerable expansion. The subjoined particulars show these exports for the past five months and for the corresponding periods of last year and the year before in ounces:

Month.	1895.	1896.	1897.
January.....	18,686	16,350	40,386
February.....	15,309	17,992	32,526
March.....	19,619	11,085	40,250
April.....	19,118	16,772	39,660
May.....	19,208	22,286	59,111
	91,950	84,465	211,973

"Last month's entries for export, it will be seen, amounted to fully 50% more than the average of the preceding four months, which largely exceeded that of any similar period in the history of the Westralian industry. The increase of 19,451 oz. in May over April was mainly obtained in the Hannan's or Kalgurli District, whence the shipments were more than twice as large as for the corresponding period of last year."

CANADA.

BRITISH COLUMBIA—KOOTENAY DISTRICT.

ANNIE MAY.—Free gold has been found in this claim on Forty-nine Creek. The property, which is owned by W. G. Robinson and S. Johns, is the extension of the well-known Majestic. There is also on the claim a 3-ft. lead of copper ore.

COPPER CLOWN.—Assays of rock taken from this claim, situated near the line of the Columbia & Kootenay Railway, seven miles from Nelson, show \$22.44 in gold and copper. The ledge is traced across the property and also across the King Copper and Copper Age, the adjoining claims. In the process of development work the ledge has been uncovered 12 ft. Perkins Bros. & Duhamel, the owners, state that they will do considerable work on it this summer.

BRITISH COLUMBIA—SLOCAN DISTRICT.

AMERICAN BOY.—Superintendent Henry Callaghan, of this mine, near Sandon, reports a strike of a 4-ft. lead in tunnel No. 1, of which he says about 2 ft. is solid ore. The company has started another tunnel 125 ft. below No. 1, which is in about 20 ft. They expect to run about 175 ft. to get below the upper winze and then drift.

FREDDIE LEE.—It is reported that work is to be resumed on this property by Charles G. Griffiths, formerly ore buyer for the smelting works at East Helena and Great Falls. The Freddie Lee is one of the old properties in the Slocan, and was the first in the district from which ore was shipped. At that time it was under the control of James F. Wardner, and passed through many vicissitudes until it was finally closed down. It has remained idle ever since, although said to be a fine property.

WASHINGTON MINING COMPANY.—This company owning and operating the Washington mine, in the Slocan country, held its annual meeting in Spokane June 8th and elected the following officers and board of trustees: President, J. L. Montgomery; vice-president, A. E. Jefferson; secretary, R. L. Clarke; and treasurer, John L. Retalack. The report of President Montgomery showed that "the development work during the winter disclosed a streak of ore all along the hanging wall of the vein in the intermediate tunnel for a distance of nearly 70 ft. back from its present face. The cross-cut from the bottom of the winze in No. 3 tunnel disclosed from 2 to 3 ft. of mixed quartz, galena and zinc on the hanging wall of the vein. A large flow of water compelled the discontinuance of the work before the foot wall of the vein was reached. All of the stopes show concentrating ore, the major portion of them having continued to show improvement as the work progressed. Nearly 60 tons of clean ore have been taken out in the course of development and shipped to smelters, the average assay of which was 120 oz. of silver and 72% of lead." The report shows that the mill has been working since May 7th, and that the present force of mine and mill is about 50 men.

BRITISH COLUMBIA—TRAIL CREEK DISTRICT.

(From Our Special Correspondent.)

BLUE BIRD AND CURLEW.—These properties adjoin each other, but are owned by different parties. Considerable development work has been done on each, and the surface and other indications are unusually favorable. Work for this season, however, has not commenced.

DERBY.—This claim lies beneath the ore train of the Le Roi and a 35-ft. shaft has been sunk with the view of tapping the Le Roi vein, but work at present is suspended owing to the lack of funds.

MAYFLOWER.—The shaft on this property is filled with water and up to June 9th no work had been done for the season. It is reported that work in the shaft and tunnel would shortly commence. A small quantity of ore has been stored over the dump.

O. K.—Some difficulties having arisen with regard to the management of this mine, the mill has been temporarily closed. Mr. J. L. Warner, who has been local manager for some months past, resigned some days ago and his place has been filled by H. W. Goodhue, who is now local manager and in charge of the property.

There has also been a reorganization of the directorate. The mill will resume operations at once. The I. X. L., an adjoining claim, has 400 tons of ore ready for treatment in the O. K. mill. This will be run through at once. In the meantime it is proposed to work some new ore bodies on the O. K., which have been kept in reserve. One of the results of the recent difficulties has been a marked depreciation of O. K. stock. This may be restored to its former level under conservative management.

RED EAGLE.—At a depth of 75 ft. in the shaft of this property a vein of chalcopryrite was encountered. It is of a fair quality but as yet no great body of it has been uncovered. The development work in the shaft is being vigorously prosecuted.

ROSSLAND HOMESTAKE.—This property has been frequently described. It is situated about 1½ miles south of Rossland, in the South Belt. After passing through the hands of the original locators, who did a small amount of development work, the present owners came into possession. The ledge on this property is very evasive, and it has been traced all the way up the east face of Deer Park Mountain. It is believed to be the same ledge on which the Sunset is located, and, in a southeast direction, on which the Gopher, R. E. Lee and Maid of Erin are situated. The surface showing of the iron cap on these properties is very promising, and led the first locators to make their selections on this ledge. In the autumn of 1896 W. G. Johnson and D. M. Lennard, of Rossland, acting for themselves and some English and Provincial investors, made an arrangement by which they obtained control of the Homestake, Gopher, R. E. Lee and Maid of Erin, and brought this group more or less under one management. W. G. Johnson was elected president of the Homestake Company and D. M. Lennard secretary and treasurer, and the same gentleman became president of the Gopher, while W. Spink was elected president of the R. E. Lee and Maid of Erin. W. S. Hawkins, formerly superintendent of the Jumbo, was appointed manager of the entire group. Machinery was at once installed in the Homestake, but not until recently has there been permanent development work. The machinery comprises an Ingersoll 80-H. P. engine and boiler with a 5-drill compressor, and a 20-H. P. hoist. "The shaft," said Mr. Haskins, "is down 125 ft. We are running down to the Gopher. We are crosscutting in that direction, and are in about 400 ft. We are running to the Gopher shaft, and it will probably be continued for a distance of 1,400 ft. down the hill. We expect to have 80 men at work on the group within the next month pushing development to the utmost." At present no work is being done on the Lee or Maid of Erin.

WHITE BEAR.—The management of this property is vigorously pushing the work of sinking the shaft having reached a depth of 145 ft. on June 9th. The hoist has been greatly strengthened by a new cable. It will take fully two months to reach a depth of 200 ft.

NOVA SCOTIA.

This season there will be four members of the Canadian Geological Survey at work in Nova Scotia. Dr. Ellis, Mr. Fletcher and Dr. Ami will visit the coal measures and complete surveys that have been going on for some time. Mr. Fairbault will resume his study of the gold-bearing rocks along the Atlantic coasts of that province. Mr. Fairbault, it is said, is persuaded by a study of the country, as compared with Australia, that the gold mining in Nova Scotia has only been superficial, and that much greater profits will be found in deep mining. Hitherto the operators have only scratched the surface, and Mr. Fairbault believes that in most of these places there are gold-bearing saddles of quartz much better worth opening up than the surface seams.

NOVA SCOTIA—GUYSBORO COUNTY.

(From Our Special Correspondent.)

GOLDENVILLE DISTRICT.—Perhaps the most important movement in gold-mining circles in Nova Scotia in many years is the purchase of areas aggregating about 100, including the several well-known mines Wellington, Palmerston, Little Palmerston, Dominion, Mayflower, Boulder and others, all in the Goldenville District. The importance of this purchase is chiefly in the character of the men who have acquired the property, who include some of the wealthiest and shrewdest men in the Province. They are Hon. William Stairs, John F. Stairs, president, Nova Scotia Steel Works; Graham Fraser, manager-director Nova Scotia Steel Works; Hon. David McKeen, vice-president Dominion Coal Company; Thomas E. Kenney, president Merchants' Bank of Nova Scotia; Michael Dwyer and Wiley Smith, directors Merchants' Bank, and Major R. G. Leckie. The purchase was made from Prof. John E. Hardman and Geo. W. Stuart, who remain stockholders in the company. It is the in-

tention of this company to equip and work this large property on the most modern scientific principles known to mining men, a principle entirely new to the working of gold mines in Nova Scotia.

RICHARDSON.—Since the installation of the new manager, Mr. Cox, the returns from this mine in the Isaacs Harbor District have been most satisfactory. The expense of mining has been much reduced by the introduction of the steam drills. Last month's returns were 276 oz., making a valuation of \$17,500 for the last 90 days, leaving a good margin of profit, the working expenses being about \$2,000 per month. The belt of ore is large, about 16 ft., and low grade, running from 3 to 4 dwt. per ton.

NOVA SCOTIA—HALIFAX COUNTY.

(From Our Special Correspondent.)

LAKE LODI.—Mr. W. A. Sanders, of Caribou District, has just completed the sale of this mine, of which he was the owner, to American capitalists. The purchase price is said to be \$50,000. There is a large belt of low-grade ore in this mine, although at times very rich deposits are found, the character of which requires different treatment from that which it has been receiving. The purchasers, however, have had tests made and intend erecting the required appliances for treatment, as well as a power drill plant, the drilling having all been done by hand heretofore.

TORQUAY.—At this mine, in Caribou District, recently an extraordinarily rich lead was found by surface prospecting. The quartz vein is about 14 in. thick, and from less than a ton of the first taken out 250 oz. of gold was taken. The shaft is now being timbered for permanent work. Your correspondent had the pleasure of examining some of this rich ore and thinks it belongs to a "pocket," although the workmen and owners claim it is from the cropping of a fabulously rich "chimney" of ore, which at the present stage of development would be somewhat difficult to determine. Nevertheless, the owners have good reason to be pleased with their showing. Last March they bought this property for \$24,000, equipped with a 15 stamp water mill. Since the acquirement they have mined 541 oz. of gold, which runs 965 fine, and have paid dividends amounting to 20% on the capital invested. The officers of the company are E. E. McNutt, Truro; E. C. Bigelow, Truro; Robert Kaulback, Mid. Musquodoboit.

ONTARIO—RAT PORTAGE DISTRICT.

(From Our Special Correspondent.)

MINING CONVENTION.—The first convention held in connection with the local mining industry has come and gone, and the universal verdict is that it was an unqualified success. The convention was held under the auspices of the Rat Portage Mining Exchange, of which Mr. George Dawey is president and Mr. Morrice is secretary. It was held during three days, June 2d, 3d and 4th, and was largely attended by gentlemen from different parts of Canada and the United States. Among those who read papers before the convention and participated in the discussions were T. A. Rickard, State Geologist of Colorado; Prof. A. P. Coleman, School of Practical Science, Toronto; A. Blue, of the Ontario Mining Bureau; Rev. Geo. Rice, of Manitoba College, Winnipeg; M. W. Hopkins, T. A. B. Purchase, late of South Africa; Prof. Wilmot McMaster, University, Toronto; Thos. R. Deacon, Rat Portage, and a large number of others. Mr. Deacon's paper was especially interesting, inasmuch as it gave the result of his five years' experience in the gold region of Western Ontario. One remark he made is significant of the impression conveyed to his mind of the extent and magnitude of the mineral resources of the district. He said in this connection that the prospecting of the district will not be completed fifty years from to-day. He also referred to the rich properties which are now being developed in the district. The convention attracted very wide attention, and there was a particularly strong representation present from the neighborhood of Duluth. Many of those who attended are now scattered over the country prospecting or looking at properties with a view to purchase.

The great point of attraction was undoubtedly the exhibit of specimens, held in the office of the Mining Exchange, where samples of rock were to be seen from a large number of properties under development in the district. Those from La Mascotte and the Cornucopia mines attracted great attention from the amount of free gold visible in them. It is felt that the convention will give great impetus to the local industry and result in a much wider knowledge of its gold-bearing properties.

MEXICO.

It is stated that the Kansas City Smelting and Refining Company has made contracts with the Southern Pacific Company to transport 2,000 tons of ore monthly from its mines in Mexico to El Paso and other points in the United States.

SOUTH AMERICA.

BRAZIL.

OURO PRETO GOLD MINING COMPANY.—In April the company's mill treated 4,545 tons of ore from the Passagem mine, the product being 1,771 oz. gold, or an average of 0.39 oz. per ton.

COAL TRADE REVIEW.

NEW YORK, Friday Evening, June 18.
Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending June 11th, 1897, compared with the corresponding period last year:

Pennsylvania Railroad.....	1897.		1896.
	Week.	Year.	Year.
	62,672	1,494,825	1,606,131

PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs., for week ending June 11th, and for years from January 1st, 1897 and 1896:

Shipped East and North:	1897.		1896.
	Week.	Year.	Year.
Allegheny, Pa.....	53,415	1,021,012	1,030,175
Barclay, Pa.....	444	22,102	20,296
Beech Creek, Pa.....	68,951	1,665,383	1,430,105
Broad Top, Pa.....	18,347	176,410	195,219
Clearfield, Pa.....	81,155	2,010,258	2,133,301
Cumberland, Md.....	81,267	1,618,557	1,344,449
Kanawha, W. Va.....	\$14,901	1,520,729	1,415,567
Phila. & Erie.....	772	156,683	31,426
Pocahontas Flat Top.....	1142,597	1,085,773	.....
Totals.....	491,849	9,274,907	7,650,638

Shipped West:	1897.		1896.
	Week.	Year.	Year.
Monongahela, Pa.....	29,676	608,045	466,195
Pittsburg, Pa.....	37,994	772,277	860,066
Westmoreland, Pa.....	43,572	836,357	929,625
Totals.....	111,242	2,216,679	2,255,886

Grand totals..... 603,091 11,491,586 9,906,524

Production of coke on line of Pennsylvania Railroad for the week ending June 11th, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 83,517 tons; year, 1,866,197; to corresponding date in 1896, 2,063,824 tons.

* For two weeks ending June 5th. † For week ending June 5th. ‡ For week ending June 7th. † For week ending June 14th.

Anthracite.

The trade in hard coal is unmistakably dull. Buyers without exception hold off, the only orders coming from them being small ones that enable them to piece out their immediate needs. The only activity noticeable is in the newspaper reports sent out from the mining regions that certain companies are going to work five days each week, and that full time will follow later in the year. At the selling end of the industry this activity is generally discredited, and when it is investigated turns out, in most cases, to be without substantial foundation; for, although more time is to be made by some of the collieries next month, it is also true that others will not be operated at all, so that matters in this way are equalized and the present production will, on those grounds, not be materially increased. The July tonnage will undoubtedly be greater than the present 2,500,000 monthly output, 3,500,000 and 4,000,000 tons being the amounts spoken of. The producing interests have talked this matter over during the week, as well as the question of prices, but whether or not they have reached a conclusion as to what the market conditions warrant cannot be positively stated. It is said 3,500,000 tons is the probable July limit. The Eastern market shows no demand that leads to the belief that more coal can be sold next month than at present, especially if prices are advanced. It is said much of the larger tonnage would go West, not because people there are buying more coal than those in the East, but for the winter business, for which preparation is always made during the summer months. The feeling that if the 40,000,000 yearly tonnage is to be reached for 1897, something must soon be done to sell more coal, is also a factor in determining a greater output in July. The companies report prices firm at circular rates, with sales of all the coal mined except chestnut.

Bituminous.

In the Eastern soft-coal trade there is nothing of importance to note; such business as there is, moves along quietly and without effort on the part of the handlers of the coal, as the bulk is not coming up to what could be done if it were necessary. Once in a while there is an offer made by a transient customer at a figure based on both a low price for the coal and low ocean freight, but these offers come in more as a surprise to the operator than an ordinary business routine affair, as it should be, and are rather looked upon as something to the good. The coal going forward is upon previous contracts, and it is likely that this will be the report from week to week for some time to come. The low prices are pretty well known to every one and appear to be down to bedrock at this time, as we have not heard for a number of weeks any lower figures quoted for coal than we did earlier in the season.

Trade in the far East is quiet, though orders are coming a shade better than they were from this consuming territory. The Sound ports show a quieting down of the demand; this is thought to be to a considerable extent brought about by the quantity of coal piled into this territory in the last few weeks. The New York harbor trade is quiet, the demand being apparently delayed as much as possible.

All-rail trade keeps moderately active. Transportation from mines to tide is fairly good. Car supply is up to all demands where the individual operator unloads his cars at destination promptly. In the coastwise vessel market vessels are in fair supply and vessel rates have fallen slightly. There seems to be a fairly large offering of barges, which

would indicate that this class of vessels is in larger supply than the demand requires.

We quote current rates from Philadelphia to Boston, Salem, Portland and Portsmouth, 55c.; Providence, New Bedford and Sound ports, 50c.; Wareham and Lynn, 65@70c.; Newburyport, 65c.; Dover, 90c. and towage; Saco, 85c. and towage; Bath, 55@60c.; Gardiner, 60c. and towage; Bangor, 65@70c. Five and 10c. above these rates is asked from Baltimore, Norfolk and Newport News.

NOTES OF THE WEEK.

In the House of Commons at Ottawa, Canada, on June 15th, Finance Minister Fielding announced that the duty on coal entering Canada had been reduced from 60 to 54c. per ton.

Buffalo.

June 17.

(From Our Special Correspondent.)

Business in anthracite coal remains in a state of quietude with no changes reported in quotations and incidents connected with the trade here.

Bituminous coal fairly active, with prices still in buyers' favor. Manufacturers moderately busy, but complaints are made that profits are very small and collections difficult.

Lake freights continue low, with small movement. It is reported that several coal shipping concerns intend resuming business in a few days. Some vessel men are sanguine that shipments of coal will soon increase in volume, so that at the end of the year the average quantity will be moved to Western and Northwestern points.

The shipments of coal westward by lake from Buffalo for the week ending June 12th aggregated 50,465 net tons, distributed as follows: 30,335 tons to Chicago, 6,250 tons to Milwaukee, 2,900 tons to Duluth, 6,100 tons to Superior, 1,330 tons to Hancock, 1,500 tons to Racine, 750 tons to Toledo, 400 tons to Saginaw, and 900 tons to Lake Linden. The rates of freight were: 20c. to Chicago, Milwaukee, Duluth, Superior, Marquette and Toledo; 25c. to Racine, Portage, Lake Linden and Hancock; and 35c. to Saginaw. It will be seen from the above figures that the quantity shipped for the week exceeded the preceding one by about 11,000 net tons, closing with an improved inquiry for vessels and a better feeling among owners.

From opening of navigation to June 1st, 52,000 net tons of anthracite and 339,339 net tons of bituminous coal passed through the Sault Ste. Marie Canals, as compared with 64,163 and 409,491 net tons respectively in 1896. Quite a decrease.

It is expected that the supply of coal for the city of Toronto's use will be bought direct from American dealers, as it is freely intimated on all sides that a combine exists among local dealers.

Plans for the New York canal improvement involving an outlay of \$2,873,850 have been approved by the State Canal Board. Work to be done before opening of navigation in 1898.

A copy report of the Buffalo Merchants' Exchange. This report, which is prepared by Mr. Wm. Thurstone, secretary of the Exchange, contains each year a great deal of matter that is of special value to any one interested in the coal trade and in lake commerce. Mr. Thurstone has occupied his present office since the organization of the first business association in Buffalo, the old Board of Trade, 33 years ago.—ED. E. & M. J.

Chicago.

June 16.

(From Our Special Correspondent.)

Anthracite Coal.—Business has been very heavy during the past week. A lull of a temporary nature, it is hoped, has set in, and there has been but little buying of hard coal in the city and from outside points. The warmer weather has affected the buying considerably, but it is hoped that the brighter industrial conditions may influence the market somewhat. Dealers appear to be putting off the purchasing of coal for the summer season, but much of that trade is expected to materialize within the next few weeks.

It is a fact that the market both in and out of Chicago in the West has never been so bare of anthracite coal as it is at the present time, and under such conditions, when trade really starts up, it will make things lively here. Prices, despite the inactive condition of affairs, are held quite firmly, and very little cutting is being done. Circular prices are: Grate, \$5.35; egg, stove and chestnut, \$5.60.

Bituminous Coal has been in much better demand and a considerable tonnage has been moved during the past couple of weeks. The prices obtained have as a rule been very low, yet apparently there has been some profit, as is shown by the large business. There is a large quantity of all grades of soft coal in this market at the present time, in fact, the market is flooded, making thereby the obtaining of better prices impossible. Prices on some grades of bituminous coal are: Pittsburg, \$2.50; Raymond, \$3; Indiana block, \$2.05; Hocking Valley, \$2.40; Youghiogheny, \$2.50; Blossburg, \$3.40.

Pittsburg.

June 17.

(From Our Special Correspondent.)

Coal.—Trade since our last was confined principally to local wants; coal operators will not pass coal through the locks until they are free, which may occur at any time. The lower markets are overstocked with coal, with sales at Cincinnati at 4c. per bushel; such prices were never known before this season.

At W. P. Read's McDonald mines, the men have

agreed to go in at the 54c. rate. Colonel Read announced that he would reduce the rent that the miners are paying for the houses they occupy that belong to him; and make a reduction on the price of coal the miners use. The Hays Coal Works, near Homestead, which had been closed for some time, started on Monday with 300 miners, who are to receive \$1.75 per hundred bushels. In the railroad district an immediate strike was averted by the cool-headedness of the leaders; some of the operators advanced wages to 60c. per ton.

The New York syndicate that made 12,000-acre purchase last week now hold options on 40,000 acres of valuable coal land in Washington Township, and will proceed at once in the erection of an immense coke plant.

Connellsville Coke.—Trade is steadily improving; there was a gain last week on production and shipments; the prospect at this writing is very encouraging for an improved business. The improvement in the demand for iron, is producing a favorable effect throughout the coke regions. The gain in production was 2,365 tons, and the increase in demand 2,975 tons. Work was begun on the new coke plant near Youngstown, where 275 ovens and 75 tenement-houses will be built. At least 300 men will be given employment. The Lippincott branch of the Pennsylvania Railroad will be extended to the works this summer.

The summary of the region for the week shows 10,315 ovens in blast with 8,082 idle. There were 38 ovens blown out and 115 fired up, an increase in the active list of 77. The 38 active ovens at the Hill Farm plant were blown out and 42 ovens fired at Parrish to supply the coke formerly made at Hill Farm. The week's production of the region amounted to 103,778 tons, an increase of 2,365 tons. In the running order, 5,047 ovens made six days; 4,816 ovens five days; 402 ovens four days, and 50 ovens, the Semet-Solvey plant, half time; an average of 5-44 days. Shipments were: To Pittsburg, 2,595 cars; points West, 2,343; shipped East, 1,224 cars; total, 6,162 cars.

Shanghai, China. May 21.

(Special Report of Wheelock & Co.)

Coal.—In Japan coal nothing of much importance has taken place since our last report. Coal from the Moji District is being offered a little more freely, but rates of freight being so high, very few orders are given. Cardiff coal remains quiet. There will be little doing in Australian Wollongong until the present stock is reduced.

We quote prices as follows: Cardiff, 13 taels per ton; American anthracite, 9 taels per ton; Sydney Wollongong, 8 taels per ton. Japan coal is 5-75 taels for Takasima lump, 5 taels for Namazuta lump, and 5-75@6 taels per ton, with an upward tendency, for other sorts.

Kerosene Oil.—During the first part of the fortnight a fairly large business was done and prices gradually advanced, and sales were made of Devoe's at 1'67½@1'70 taels, but at present cannot be obtained at the latter figures. Russian has been operated in at 1'62½ taels per case, and to arrive 1'54 taels has been paid. Langkat received some attention at 1'47 taels. Out of a cargo of Comet from Hongkong, only a portion has been sold at 1'64 taels per case. Our market closes firm with buyers of all brands at quotations. Arrivals have been 124,000 cases Batoum, 38,000 cases Langkat and 10,570 cases Devoe's. Stocks are now represented by 28,000 cases Devoe's, 290,000 cases Russian, 27,000 cases Comet and 104,000 cases Langkat. Quotations are as follows per case: American Devoe's, 1'67½ taels; Russian Batoum, 1'60 taels; Russian Batoum, bulk, 1'50 taels; Langkat, 1'47 taels.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, June 18, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending				From Jan., '96.	From Jan., '97.
	June 19, 1896.	June 18, 1897.	F'ces.	Tons.		
Anthracite.	41	25,900	24	13,800	703,938	422,286
Coke.....	135	161,170	107	152,900	4,141,509	3,532,514
Charcoal...	19	6,130	15	3,450	131,150	122,636
Totals	195	193,200	146	170,150	4,975,397	4,077,436

An increased movement is apparent in the iron market, and more activity has been shown than for many weeks past. Large buying of raw material is reported from Pittsburg, Chicago and other points, and it is believed that some of the bigger furnace interests have decided to make heavy purchases of iron ore for the season. The contracts for pig iron have been chiefly for Bessemer, with some basic pig, the movement in foundry irons being much smaller in volume, though some large Eastern concerns are understood to have decided finally to take advantage of the low prices and close contracts for deliveries running over several months.

Upon the whole the market just now is a puzzling one, and experts are much divided in opinion. While some sanguine people are announcing that the waiting period is over and activity has come at last, many others are still doubtful and inclined to hold back a little. There has been as yet no such increase in sales of finished material as would warrant the buying of large stocks for the mills, and the financial conditions do not warrant the belief that the demand for mill products is going to

develop largely just yet. It is true that money is in over-abundant supply at all the financial centers, but there is little disposition to invest in new enterprises. Borrowers are able to obtain loans at extremely low rates, but securities are very closely scrutinized and manufacturers' paper is accepted with some hesitation still. Complaints of slow collections are still frequent, and new credits are still extended with a great deal of caution.

The press despatches, especially from Western points, have very much exaggerated the buying movement. It is quite evident that there has been a concerted movement to lift the market, and that the most has been made of the actual signs of improvement. That there are such signs is quite true; but that is very far from saying that a new boom has set in. The improvement has not yet been sufficiently accepted by the trade to raise prices above the low range which has prevailed. The pressure to sell is still great enough to leave the quotations very much at the mercy of buyers; sellers being willing in most cases to accept such prices as are offered by good customers, without much hesitation.

It is not to be inferred from these remarks that we are at all desirous to see the market continue in its present condition. It is a much pleasanter task to chronicle a rising than a falling market; but it is most of all essential to give the true conditions of the trade as the facts reveal them.

Many reports of speculative buying of iron are current. It is said, for instance, that Russell Sage has bought 100,000 tons of Alabama iron on the basis of \$5.75 per ton for gray forge; and that a pool is being made up in New York to purchase an equal quantity. These rumors are given for what they are worth, as it is impossible to verify them. It is not improbable that some speculative buying is going on, but reports about such transactions are always to be accepted with caution.

Railroad buying continues rather light, the companies having apparently rested on the heavy contracts for rails placed at the time of the breaking of the pool. The earnings of the roads generally are not making a very favorable showing. In this branch of the trade—as in all others, indeed—much depends on the condition of this year's crops, which is still uncertain.

An amendment providing for the free admission of iron ore has been offered in the Senate; but the general impression is that the present duty of 40c. per ton will stand in the new tariff. At present it does not look as if the bill would have much effect either way upon the iron trade.

New York. June 18.

The situation in the local iron market during the past week has developed into a state which in algebra is denoted by an unknown quantity and bids fair to continue in that condition until such time as legitimate trade is allowed to rule prices, which is not the case at the present writing, although the number of orders closed during the past week has tended to increase confidence and act on the market so as to produce a buoyancy which has not existed for some time.

The report of a consummation of a deal involving the sale of 100,000 tons of Southern pig iron is denied by some of the parties said to be interested and we also note the failure to form a pool of still larger magnitude which has been under consideration for the past 10 days.

Prices, as a rule, have remained unchanged, although an improvement is looked for in the near future, with most companies not quoting prices over 30 days; some have entirely retired from the market, among whom we can mention the Tennessee Coal and Iron Company, who give as a reason the statement that they will wait until such time as their material will command prices higher than those now obtained.

Pig Iron.—Local sales agents are satisfied with the tonnage booked during the past week, although prices remained stationary, which was very disappointing to some who looked forward at the closing last week to better figures by the end of this week.

We quote Northern No. 1 X foundry, \$12@ \$12.50; No. 2 X foundry, \$11@ \$11.25; No. 2 plain, \$10.50 @ \$11; gray forge, \$9.75@ \$10.25; Southern No. 1, \$10.25@ \$10.75; No. 2, \$9.75@ \$10; No. 1 soft, \$10.25@ \$10.50; No. 2 soft, \$9.75@ \$10; gray forge, \$9.25@ \$9.50; basic, \$10.25@ \$10.50. All prices are for tidewater delivery.

Cast-Iron Pipe.—The demand for cast-iron pipe has increased somewhat during the past week with prices stationary.

Spiegeleisen and Ferro-Manganese.—The trade locally is reported as without changes, although with a better demand. Prices are: For spiegeleisen, 20%, \$19@ \$19.50 per ton; ferro-manganese, 80%, domestic, \$45, delivered at buyer's mill.

Steel Billets.—The local billet market remains quiet, with prices stationary, although much firmer than our last report, at about \$15.25@ \$15.50.

Merchant Iron and Steel.—The demand has increased slightly, with prices unchanged at: Common bars, 1@ 1'05c.; refined, 1'10@ 1'25c.; soft steel bars, 1'05@ 1'10c. Other quotations are: Steel hoops, 1'35@ 1'40c.; base; steel axles, 1'55@ 1'60c.; links and pins, 1'50@ 1'60c.; light cotton ties, 50c. per bdl. at mill. All prices are for delivery on dock New York, and are for large quantities.

Plates.—The activity mentioned in our last report is still noticeable, with prices unchanged. We

quote for universal mill plates 1'15@ 1'20c. For steel plates prices are: Tank, 1'10@ 1'15c.; boiler shell, 1'20@ 1'30c.; flange, 1'35@ 1'40c.; firebox, 1'60@ 1'75c., and 2'25@ 2'50c. for locomotive firebox, according to quality. Charcoal iron plates are 2'25c. for shell, 2'75 for best flange and 3'25 for firebox. Rivets are 3@ 3'25c. for iron and 1'75@ 1'85c. for steel. Prices are for tidewater delivery in large quantities.

Structural Iron and Steel.—The state of trade in structural iron and steel continues normal, with evidence of much better business, with corresponding prices in the near future. We quote for angles, 1'10@ 1'15c.; tees, 1'35@ 1'50c.; channels, 1'25@ 1'30c. The price of beams, New York delivery, is 1'25@ 1'30c. for ordinary sizes, 1'45c. for 20-in., and 1'50c. for 24-in., carload lots.

Steel Rails and Rail Fastenings.—The market for rails and rail fastenings shows a marked improvement with nominal prices for the former and slightly higher prices for the latter. We quote: Standard section steel rails, \$18@ \$20 at mill, and girder rails \$23. The market for light rails indicates a revival of business with prices for 8, 12, 16 and 20-lb. rails at \$28@ \$33 per ton.

Quotations for rail fastenings are: Angle-bars, 1'15@ 1'20c.; spikes, 1'50@ 1'60c.; bolts, 1'80@ 1'90c. for square nuts and 1'85@ 1'95c. for hexagon nuts. These prices are for carload lots.

Wrought-Iron Pipe.—The market has continued favorable during the past week, with prices still strong, and discounts are as follows: For plain pipe, out of store: 1½ in. and over, 67, 10, 10, 10 and 10%; 1½ in. and under, 50, 10, 10, 10 and 10%. Galvanized pipe, 1½ in. and over, 55, 10, 10, 10 and 10%; 1½ in. and under, 50, 10, 10, 10 and 10%. For fair-sized orders these discounts are made with an additional 5% for less than carload lots. For carload lots this additional discount is 7½% to 10%.

Nails.—Wire nails have been in fair demand with prices steady at \$1.55@ \$1.65, while at mill they are \$1.35@ \$1.45. In cut nails trade also continues strong; \$1.32 base is quoted as New York price in carload lots with \$1.42 for smaller than carloads.

Old Material.—Business has revived during the past week with the demand better than it has been for some time. We quote old iron tee rails, \$11@ \$12 per ton; old steel rails, \$10@ \$11; No. 1 wrought scrap iron, \$10@ \$11; good machinery scrap, \$9@ \$10, all f. o. b. cars; wrought pipe and tubes, \$7.50 per ton; car wheels, delivered at buyer's works, \$9@ \$10; burnt iron, \$5@ \$6; cast borings, \$6.50@ \$7 per ton delivered at mill.

Chicago. June 16.
(From Our Special Correspondent.)

Pig Iron.—The week has been quite active in sales of pig iron, the Northern furnaces managing to secure by far the greater amount of the business transacted. The market appears to be in much better condition, and within the past two weeks a considerable more inquiry has developed, numbers of such calling for fairly large quantities of pig iron. The Northern furnaces appear to be holding prices firmer and the market is gradually assuming a steadier condition. Southern iron business for the week was not very large and prices are as yet inclined to weakness. There is some probability of further reductions in Southern freight rates. Quotations are as follows: Lake Superior charcoal, \$13@ \$13.25; local coke foundry No. 1, \$10.50@ \$10.75 No. 2, \$10.25@ \$10.50; No. 3, \$10@ \$10.25; local Scotch foundry No. 1, \$10.50@ \$10.75; No. 2, \$10.25@ \$10.50; No. 3, \$10@ \$10.25; Southern coke, No. 1, \$10.25@ \$10.50; No. 2, \$9.75@ \$10; No. 3, \$9.50@ \$9.75; Southern No. 1 soft, \$9.75@ \$10.25; No. 2 soft, \$9.75@ \$10; Jackson County silveries, \$13@ \$15; Ohio silveries, \$13@ \$15; Ohio strong softeners, \$12@ \$12.25; Alabama car wheel, \$15.50@ \$16; coke Bessemer, \$11.50@ \$12.

Bar Iron.—Implement makers have been of an inquiring turn of mind during the past two weeks and contracts aggregating between 30,000 and 40,000 tons of bars are in the market. The week's business has been rather better than the preceding week and a few of the inquiries are likely to run into actual business soon. Prices are a trifle firmer, though as yet there is much difference among the mills. Quotations are made by them all the way from 1@ 1.10c. and higher for common iron.

Steel Rails.—The demand for rails continues mostly for the lighter sections. Sales of heavy sections appear to be few and for small quantities. Rails are quoted \$21@ \$23, Chicago.

Billets and Rods.—Both billets and rods are inactive, but few small sales having been closed. Billets are now quoted \$16, and rods \$22.

Structural Materials.—Bridge and building material are again in better demand, and the prospects are better for the early future trade. There is nothing particularly large in the market, but there is a very fair aggregate of small business. Quotations are: Beams and channels, 1'15@ 1'20c.; plates, 1'10@ 1'15c.; angles, 1'10@ 1'15c.; tees, 1'30@ 1'40c.

Cleveland. June 16.
(From Our Special Correspondent.)

Iron Ore.—The trade in iron ores during the past week has been quite satisfactory. The volume of business has been heavy, although the sales have been small. In view of the present condition of business there is a growing belief that the whole quantity of ore sold this year will be almost as large as last year. The low price of ores this year has had the effect of increasing the number of tons going

into consumption. Up to the present, however, the sales do not compare favorably with those for the corresponding period of last year. An idea may be gained of the condition of business by a comparison of the receipts of ore at the ports comprising the Cleveland customs district for May, 1896 and 1897. During that month a year ago they were 1,065,844 tons, while last month only 552,275 tons were reported. The movements will be much livelier in the immediate future, however, as nearly all the lake tonnage is out, and in consequence the rates are depressed, although there is no change.

The ore prices follow: Specular and magnetic ores, Bessemer quality, \$3@3.75; specular and magnetic ores, non-Bessemer quality, \$2.50@2.75; hematite ores, Bessemer quality, \$2.50@3; hematite ores, non-Bessemer quality, \$2@2.50.

Pig Iron.—The prices for all varieties of pig iron are steady, notwithstanding the fact that there has been no active demand during the past week or ten days. Sales have been made, but they were small, and even the aggregate would not foot up to any large amount. The quotations follow: Lake Superior charcoal, \$13.25; Bessemer, \$9.75@10; No. 1 foundry, \$10.50@10.75; No. 2, \$10@10.25; No. 1, Ohio Scotch, \$10.65; No. 2, \$10.15; gray forge, \$8.75@9.

Philadelphia. June 18.

(From Our Special Correspondent.)

Pig Iron.—Iron sold more readily this week than at any time since last year. Every buyer who had a promise or assurance from a broker or agent is after iron, and a good deal has been sold, though there is nothing like a heavy demand. The future is mixed despite the talk of a rushing demand. This is due to the conviction that there is a great deal of iron seeking a market. We will be largely guided by what goes on in Western Pennsylvania and Ohio pig-iron markets. Should there be strong evidences of covering summer and autumn requirements in those markets we will move faster. Last week's quotations must be repeated: No. 1 X foundry, delivered, \$11.75@12.25; No. 2, \$10.70@11.25; forge, \$9.50, for ordinary, to \$10.25 for best; basic iron, \$11, and low phosphorus, \$15.

Billets.—Buyers are contented to use down their stocks lower and will probably not concern themselves much about replenishing until July, taking the risk of that delay.

Merchant Bar.—Mill owners have gathered up an encouraging amount of business during the past three days, and this morning's mail in three or four offices was very bright. Store stocks are also disappearing and prices are said to be firm, although this is hardly the right way to put it.

Skelp.—The receipt of two or three more inquiries shows some work is in sight, but we have had fruitless inquiries all along.

Sheets.—The storekeepers report a little improvement over last week.

Pipes and Tubes.—Mills having a fair amount of work on hand are cutting quotations this week to hasten the negotiations on new work. Brokers who are in touch with some skelp-using enterprises give a rather dolorous outlook as to work. Prices are very low.

Merchant Steel.—The movement in various kinds of merchant steels subsided for a while, but is now reviving all around though limited by urgent shop necessities, our people have not yet begun to place big orders at mills and do not need to.

Plates.—The shipyards came in this week with moderate orders for plate material and made offers which manufacturers promptly accepted. Some new work has been heard of, which will lead to offers by our manufacturers as soon as the kind of material, size, etc., can be known. More ship plates are to be ordered by the latter part of this month. Tank is 1.5c.; universals, 1.20c.; flange, 1.30c.; fire-box, 1.50c. upward.

Structural Material.—Local mills have been favored with orders aggregating 4,000 tons. Angles are 1.15c.; beams and channels, 1.25@1.40c. Reports from other markets have a good effect here. A good deal of office building work will be started in July. Small jobbing orders are more numerous.

Steel Rails.—No specific statements can be had relative to new orders. Considerable small order business is being done. Quotations \$19@20.

Old Rails.—Parties representing buyers say nothing, but a drop in prices will lead to large export orders. The present home demand is unimportant.

Scrap.—Some dealers have succeeded in selling large lots of scrap, but had to shade their long-standing quotations. Old car axles will sell any time if prices are right. Some stuff is offered at \$12@12.50. Good steel scrap commands \$10 when the needing buyer comes around. Good railroad stuff will bring \$12.

Pittsburg. June 17.

(From Our Special Correspondent.)

Raw Iron and Steel.—In whatever light you view it, the iron and steel trade presents a decidedly better appearance as regards prices and demands; confidence is daily returning and preparations are being made in all directions for a largely increased business. The sales of iron and steel for the first two weeks in June beat all previous records in the volume of transactions; deliveries of many of the large sales will extend to the first of next January. This fact shows that consumers are convinced that lower prices for some time to come

are out of the question. The principal fact is that production of pig iron for some time past was much in excess of the demand in the manufacture of finished and other products, so that iron was being piled up in the yards of the various furnaces. While some parties are of the opinion that the fear of labor troubles has stimulated buyers to purchase, the fact is very evident that parties who have large contracts for work to be finished this fall and winter have made the discovery that the time has come to purchase sufficient stock to meet their engagements, as prices are certain to be no lower.

The condition has changed in the betterment of prices and demand. With the stiffening of prices the outlook is more encouraging than it has been for months. Finished material in most branches of the market shows a better demand during the week; large orders, however, are not numerous, but there is an increased inquiry that may result in liberal orders before many days; prices are steady. For wire rods the market was steady with sales at \$20.50 delivered. For wrought iron and steel pipe there was an increased inquiry, notwithstanding the heavy contracts booked within a short time; prices are firm but unchanged. A. M. Byers & Company's big pipe plant will close on July 1st, for repairs and improvements, after running a year without stopping. Wire nails are in fair demand; the failure to form a wire pool caused a weakening in prices. The mills are busy working on old contracts.

Latest.—The market remains steady with a fair trade demand; sales show but few changes. Muck bar prices declined, while skelp iron and steel show an advance. Sheet bars show a material decline. For scrap material the demand is improving; old steel rails were more inquired for. For Bessemer pig last week's prices were maintained. Valley furnace men are firm in their views and sales show various prices. Steel billets continue in moderate demand; sales vary from \$14 to \$14.85.

COKE, SMELTED, LAKE AND NATIVE ORE.		SKELP IRON.	
Tons.	Cash.	Tons.	Cash.
15,000 Bess., S. to J., Venango Val.	9.25	800 W. G., Pitts. \$1.10 4 m.	600 N. G., Pitts. 1.10 4 m.
10,000 B. S. O. N., P. 1.10		500 Sheared, Pitts. 1.25 4 m.	
10,000 B. J. A. S., P. 9.90		SKELP STEEL.	
8,000 B. A. S., Val. 9.35		1,000 N. G., Pitts. \$0.90 4 m.	
5,000 B. A. S., Pitts. 9.90		870 Sheared, Pitts. 1.10 4 m.	
2,000 B. J. J. Val. 9.25		600 W. G., Pitts. 0.90 4 m.	
1,500 Hess. J. Val. 9.25		Tons. Cash.	
1,500 Mill L. A. S. P. 8.80		SHEET BARS.	
1,500 Mill L. J. to O. P. 8.50		2,200 Del. Pitts. \$17.25	
1,000 Mill L. J. J. A. P. 8.30		1,900 Del. Pitts. 17.25	
1,000 Bess., J. A. S. V. 9.60		500 Del. Pitts. 16.75	
100 No. 2 Fdy. P. 9.50		STEEL WIRE RODS.	
100 No. 1 Foundry.		2,000 Delivered, Pitts. \$20.60	
June, Pitts. 4 m. 10.75		8,000 Delivered, Pitts. 20.50	
50 No. 2 Fdy. pr. P. 9.65		MUCK BAR.	
CHARCOAL.		1,000 Neu., Del. Pitts. \$17.65	
200 Cold Bl. Pitts. \$21.50		500 Neu., Del. Pitts. 17.25	
75 No. 2 F. Pitts. 15.00		BLOOMS, BILLETS, BAR ENDS.	
25 Cold Bl., Ex. P. 26.50		1,000 Bloom & bil ends \$9.75	
25 Cold Bl., Pitts. 21.50		FERRO-MANGANESE.	
25 No. 2 F. Pitts. 15.25		300 80% del. P. \$46.00	
BLOOMS, BILLETS, SLABS.		OLD RAILS AND SCRAP.	
8,600 Bill., J. J. A. Pitts. \$4.80		400 S. R., st. pr. gr. P. \$9.50	
5,000 Bill., J. A. S. Pitts. 4.85		400 S. R., m. gr. P. 9.75	
2,000 Bill., Aug. Pitts. 4.75		400 M. stock, gr. P. 9.50	
1,000 Bill., J. A. Pitts. 4.60		300 S. R., st. pr. gr. P. 9.50	
500 Bill., June, Pitts. 4.10		150 Iron R., gross, P. 11.50	
500 Bill., pr. Pitts. 4.10			
300 Bill., spot. Pitts. 4.125			

Cartagena, Spain. June 2.

(Special Report of Harrington & Holt.)

Iron and Manganiferous Ores.—There has been a lull in the shipment of ores for the last few weeks. Higher-grade manganiferous and dry ores are in good demand. There have been inquiries for deliveries over the next half year, though at lower prices than holders are inclined to accept. Colorados are pretty well off the market for the present. During May there were shipped eight cargoes of dry ore, 13 of manganiferous and one of 60% magnetic ore. Most of the dry ore went to Germany. We quote for ordinary 50% Portman ore, 5s. 6d. @6s. per ton; special low phosphorus, 5s. 9d. @6s. 2d.; extra quality and special, 6s. 6d. @7s.; specular ore, 60%, 9s. 3d.; magnetic ore, 60%, 10s. 4d. per ton. Quotations for manganiferous ores are: No. 1, 20% iron and 20% manganese, 15s. 8d.; No. 1 B, 25% iron and 17% manganese, 13s.; No. 2, 30% iron and 15% manganese, 11s. 6d.; No. 3, 35% iron and 11% manganese, 10s. 4d. per ton. All prices are f. o. b. shipping port.

Other Metals.—Other exports during May included 2,100 tons zinc ores (blende) to Antwerp; 8,304 kg. copper scrap to Marseilles and 1,012 kg. quicksilver to London.

METAL MARKET.

NEW YORK, Friday Evening, June 18, 1897.

Gold and Silver.

Prices of Silver per Ounce Troy.

June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.	June.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$1.
12	4.87	27 1/2	59 1/2	.463	16	4.87	27 1/2	60 1/2	.465
14	4.87	27 1/2	59 1/2	.463	17	4.87	27 1/2	60 1/2	.468
15	4.87	29 1/2	60	.464	18	4.87	27 1/2	60 1/2	.468

Silver, the last few days, has been firmer. The advance has been owing to speculative buying, probably for the purpose of covering June contracts. These orders now being filled business closes at lower prices. Banks for some days past have been only moderate buyers, or else have been out of the market entirely.

The United States Assay Office in New York reports the total receipts of silver at 45,000 oz. for the week.

Average Monthly Prices of Silver

In New York and London, per ounce Troy, from January 1st, 1897, and for the years 1896 and 1895.

Month.	1897.		1896.		1895.	
	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.	Lon-don. Pence.	New York. Cents.
January	29.74	61.79	30.69	67.13	27.36	59.69
February	29.68	61.67	31.01	67.67	27.47	59.90
March	28.96	63.06	31.34	68.40	28.33	61.98
April	28.36	61.85	31.10	67.92	30.39	66.61
May	27.86	60.42	31.08	67.85	30.61	66.75
June			31.46	68.69	30.47	66.64
July			31.45	68.75	30.48	66.75
August			30.93	67.34	30.40	66.61
September			30.19	65.68	30.54	66.90
October			29.68	65.05	30.89	67.64
November			29.46	64.98	30.79	67.40
December			29.70	65.24	30.40	66.47
Year			30.67	67.06	29.53	65.28

The New York prices are always per fine ounce, or ounce of pure silver; the London quotation is per standard ounce, or for metal .925 fine.

Gold and Silver Exports and Imports

At all United States ports, May, 1897, and years from January 1st, 1897 and 1896:

	Coin and bullion.		In ores.		Total excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
GOLD					
May	\$9,466,711	\$559,958	\$1,260	\$389,118	E. \$8,518,895
1897	17,376,839	3,064,897	93,059	1,779,074	E. 12,625,326
1896	36,020,485	24,351,762	87,341	500,298	E. 11,185,766
SILV.					
May	4,337,342	766,704	12,200	1,990,080	E. 1,592,758
1897	22,808,437	3,463,007	259,150	8,556,468	E. 11,015,712
1896	25,579,452	4,956,084	569,919	6,929,276	E. 14,784,008

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

Gold and Silver Exports and Imports, New York

For the week ending June 18th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k					
1897	\$703,800	\$56,017	\$784,871	\$71,221	E. \$1,361,393
1896	29,649,427	17,107,099	17,572,595	1,071,901	E. 29,143,132
1895	32,534,147	19,825,487	16,373,170	892,182	E. 28,279,618
1894	62,823,944	9,488,783	18,104,612	775,887	E. 70,663,886

FINANCIAL NOTES OF THE WEEK.

Business continues generally quiet and without special incident. The tariff debate in the Senate continues to drag along, much to the disgust of business men generally, and the prospect that Congress will continue in session until August at least, which now seems probable, is not at all reassuring. The Hawaiian annexation treaty, which has been suddenly brought forward this week, is regarded with doubt. Some think that it will serve a good purpose in withdrawing attention from Cuban affairs and quieting the jingo element for a time; but many are inclined to deprecate the policy of annexation and the future complications which it may bring.

Gold exports continue on a small scale, \$600,000 having gone out earlier in the week, while up to the present writing only \$350,000 is reported taken for shipment by Saturday's steamers. The exports at present, in the face of the heavy trade balance shown below, seem to be largely the result of sales here of American securities lately owned in Europe.

The report of the Bureau of Statistics of the Treasury Department shows that while imports in May were large, reaching a total of \$79,321,827, they were much below the extraordinary amount reported in April. This was, of course, to be expected, the rush to bring in certain articles in advance of the passage of the new tariff bill being over for the time. For the 11 months of the fiscal year from July 1st to May 31st, the statement is as follows:

	1895-96.	1896-97.
Exports	\$815,901,067	\$977,691,730
Imports	723,560,934	679,511,071
Excess, exports	\$92,340,133	\$298,180,659
Add excess of exports, silver		29,319,683
Total		\$327,500,342
Deduct excess of imports, gold		51,184,881
Apparent balance		\$276,315,461

The gold and silver movement in detail will be found in the usual place, in the tables at the head of this column.

The statement of the United States Treasury on Thursday, June 17th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	June 10.	June 17.	Changes.
Gold	\$141,156,337	\$144,319,783	I. \$3,163,446
Silver	25,502,373	27,516,981	I. 2,014,608
Legal tenders	32,235,404	32,398,070	I. 162,666
Treasury notes, etc.	29,241,324	29,393,436	I. 152,112
Totals	\$228,135,938	\$233,532,687	I. \$5,396,749

Treasury deposits with national banks amounted to \$17,502,233, an increase of \$196,998 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending June 12th gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	\$507,925,500	\$471,272,300	\$513,728,700
Deposits	563,516,000	496,829,400	565,110,500
Circulation	13,747,500	14,510,900	14,251,500
Reserve:			
Specie	66,269,300	62,394,900	89,267,800
Legal tenders	113,803,600	82,489,500	114,611,300
Total reserve	\$180,072,900	\$144,884,400	\$193,879,100
Legal requirement	142,201,000	124,207,350	146,277,625
Surplus reserve	\$37,868,900	\$20,677,050	\$47,601,475

Changes for the week this year were increases of \$1,810,000 in loans and discounts; \$3,855,400 in deposits; 3,287,600 in legal tenders, and \$2,280,650 in surplus reserve; decreases of \$70,800 in circulation, and \$43,100 in specie.

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

Banks.	1896.		1897.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Assn.	\$62,394,900	.....	\$89,267,800	.....
England	245,395,955	.....	181,604,255	.....
France	407,140,463	\$251,726,345	359,564,100	\$245,844,300
Germany	233,620,000	61,226,000	228,680,000	0
Austro-Hun.	136,590,000	61,226,000	172,670,000	63,153,000
Netherlands	13,177,000	35,020,000	13,150,000	35,010,000
Belgium	19,930,000	.....	20,518,000	.....
Spain	62,028,000	55,168,000	44,163,000	51,797,000
Italy	61,265,000	10,365,000	59,490,000	11,580,000
Russia	434,770,000	.....	482,480,000	.....

The return for the Associated Banks of New York is of date June 12th; all the others are of June 17th, except the Bank of Italy, May 10th, and the Bank of Russia, May 1-13th. The New York banks do not report silver separately, but the specie carried is chiefly gold coin. The Bank of England and the Bank of Russia report gold only. The Imperial Bank of Germany and the Belgian National Bank do not report gold and silver separately.

Shipments of silver from London to the East for the year up to June 3d are reported by Messrs. Pixley & Abell's circular as below:

	1896.	1897.	Changes
India	£1,745,798	£2,190,450	I. £444,652
China	472,476	44,512	D. 427,964
The Straits	483,032	96,305	D. 386,727
Totals	£2,701,306	£2,335,267	D. £366,039

Arrivals for the week this year were £155,000 in bar silver from New York, £32,000 from Chile, and £16,000 from the West Indies; a total of £203,000. Shipments for the week were £72,700 in bar silver to India, and £13,800 in Mexican dollars to the Straits Settlements; a total of £86,500.

Indian exchange has been steadier; applications for Council bills were larger and the average price was 14 4/8d. per rupee. The bank rate for money in India continues very high.

Exports of specie from San Francisco by water for the five months ending May 31st were:

	Silver.	Gold.	Totals.
China	\$2,032,661	\$19,992	\$2,052,653
Japan	1,742,270	.....	1,742,270
India	410,800	.....	410,800
Honolulu	65,522	150,000	215,522
Tabiti	3,300	.....	3,300
Mexico	.....	760	760
New York	159,902	13,362,615	13,522,517
Totals	\$4,412,453	\$13,533,367	\$17,945,822
Totals, 1896	5,758,614	9,356,719	15,115,333

Silver exports showed a decrease this year of \$1,346,180. There was a large increase in shipments of gold coin to New York.

Prices of Foreign Coins.

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

	Bid.	Asked.
Mexican dollars	47 1/2	49
Peruvian soles and Chilean pesos	45	45
Victoria sovereigns	4 88	4 90
Twenty francs	3 87	3 90
Twenty marks	4 78	4 80
Spanish 25 pesetas	4 78	4 85

Other Metals.

Copper.—There has been a little more activity, originating mostly abroad. Business at home is slowly drifting toward an improvement, but prices are not as yet any higher than we quoted them last. There are, however, signs of an advance, which it appears safe to predict will materialize if orders from abroad continue to come in in as satisfactory a manner as during the last few days. We quote Lake copper 11@11 1/2c; electrolytic in cakes, wire-bars or ingots, 10 1/2@10 3/4c; cathodes, 10 1/2@10 3/4c, and casting copper, 10 1/2c.

The foreign market shows quite an improvement. G. m. b.'s, which closed last week at £48 10s., have advanced to £49 2s. 6d. for spot, and £49 10s. for three months prompt, which are the closing figures. Consumption abroad continues on a very large scale, and consumers do not appear to be amply supplied. The statistical position of the metal continues to improve, stocks on June 15th showing another decrease amounting to 1,400 tons, bringing down the total supplies to about 32,300 tons, about 4,000 tons less than at the same time last year, in spite of the enormous production and the far from satisfactory consumption at home. We quote manufactured sorts: English tough, £52@£52 10s.; best selected, £52 2s. @£52 15s.; strong sheets, £59 5s.; India sheets, £55 10s.; yellow metal, 5d.

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

Production fine copper, long tons:	May, 1897.	Five mos., 1896.	1897.
Reporting mines in U. S.	17,805	79,355	84,998
Pyrites and outside sources U. S.	1,000	6,000	4,000
Reporting foreign mines	7,116	35,200	36,628
Total production, long tons	25,921	120,555	125,626
Exports from U. S., fine copper	12,175	48,521	52,193

The total production of copper in the United States this year was 88,998 tons, an increase over 1896 of 3,643 tons, or 4.3%. Exports show an increase this year of 3,672 tons, or 6%. The exports this year were 58.6% of the United States production.

Tin too has scored another advance, the price for spot having risen to 13 3/8c, not so much in sympathy with the improvement abroad, which has not been quite so marked, but more so in consequence of a continued scarcity of supplies; a condition which will exist until the arrival of a steamer with 1,200 tons aboard, which is due here in about a week. Little or no business has been transacted for forward delivery, consumers taking evidently no stock in the stability of prices.

The foreign market, which closed last week at £61 5s., has since advanced to £62@£62 2s. 6d. for spot and £62 10s. @£62 12s. 6d. for three months prompt, which are to-day's closing figures.

Lead is very strong, values having advanced to 3 3/8c. The demand has suddenly become very brisk and the offerings are exceedingly limited. Refiners appear to be sold up, and while some of the consumers are fairly well supplied, others have little stock to fall back upon. The advance appears to be the result of the question of supply and demand only, and not at all brought about by the prospective tariff change, which if enacted to impose a duty of 1 1/2c. on lead ore, will considerably enhance values. With the ruling price abroad for lead, it will not be possible to retain any resulting from foreign ores for home consumption at less than about 3 3/8c.

The foreign market is again higher, the closing quotations being £12 for Spanish and £12 2s. 6d. for English. The supplies continue to be very limited, or rather, consumption has made such strides that it has not been possible for production to keep up with it.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Pig lead is strong and higher, largely on account of favorable and buoyant advices from seaboard markets. Latest sales were on a basis of 3 1/2@3 17 1/2c. for ordinary, and 3 20c. for corroding lead. Demand is fairly active, and there seems to be a general improvement in the lead trade all over the country.

Spanish Lead Market.—Messrs Barrington & Holt write from Cartagena, Spain, under date of June 2d, as follows: Though London quotations for argenteriferous lead have been rising, silver has fallen in price. However, exchange on London averaged 32 1/2 pesetas per £1 in May, against 32 3/4 for April. The average local quotation for pig lead on wharf has been 62 1/2 reales per quintal, silver to be paid at 14 40 reales per ounce. Exports of pig lead from Cartagena in May were 2,502,434 kg. to Marseilles, 2,501,635 kg. to Newcastle and 1,444,791 kg. to London; a total of 6,448,860 kg. We note also exports of 70 tons galena to Marseilles, and 1,456 kg. silver to the same port.

Spelter is quiet but steady at 4@4 05c. St. Louis and 4 25@4 30c. New York. Business continues on a rather limited scale, and with production constantly on the increase, the prospect for the maintenance of values, much less an advance, is very dim.

The foreign market has been quiet, with the quotations unchanged at £17 5s. for good ordinaries and £17 7s. 6d. for specials.

Antimony is dull at 7 1/2c. for Cookson's, 7c. for Hallett's, 6 1/2c. for U. S. Star and 6 1/4c. for Japanese.

Nickel.—Business continues quiet, and no change in prices can be reported. We quote for ton lots

33 1/2@36c. per lb., and for smaller orders 35 1/2@38c. London prices are 14@16d. per lb., according to size of order. The London price is about on a parity with New York, allowing for the duty of 6c. per lb.

Platinum.—Prices are firm at \$14@15 per oz. New York. The London quotation is 55s. @56s. per oz.

For chemical ware, best hammered metal, Messrs. Eimer & Amend, New York, furnish the following quotations, the prices given being respectively for orders of over 250 grams, for orders of over 100 grams and less than 250 grams, and for orders of less than 100 grams: Crucibles and dishes, 54c., 55c. and 56c. per gram. Wire and foil are 52c., 53c. and 54c. per gram.

Quicksilver.—The New York quotation is unchanged at \$39.75 per flask. The London price stands at £7 7s. 6d. per flask, with the same price named from second hands.

Receipts of quicksilver at San Francisco in May were 718 flasks, and for the five months ending May 31st 5,900 flasks, against 15,339 flasks for the corresponding period last year. Exports for the five months were: To New Zealand, 20 flasks; British Columbia, 13; Central America, 600; Mexico, 1,600; total, 2,242 flasks. No shipments have been made to China or to New York this year. The light receipts do not signify light production, but rather increased shipments direct from the mines.

The Minor Metals.—Quotations are given below for New York delivery:

Aluminum:	No. 1, 98% ingots, 37@37 1/2c.	Bismuth, 30 lb., \$1.50@1.80.
No. 2, 94% "	" 31@31c.	Phosphorus, 30 lb., 50@55c.
Ingots, scrap, "	" 30c.	Tungsten, 30 lb., 70c.
Rolled sheets, "	" 46c. up	Tungstic acid, 45c.
Alum.—Nickel, "	" 35@40c.	Ferro-tungsten, 60% 60c.

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

Average Monthly Prices of Metals

In New York, for the years 1897 and 1896; in cents per pound.

Month.	COPPER.		TIN.		LEAD.		SPELTER.	
	1897.	1896.	1897.	1896.	1897.	1896.	1897.	1896.
Jan.	11 75	9 87	13 44	13 02	3 04	3 08	3 91	3 75
Feb.	11 92	10 64	13 59	13 44	3 28	3 19	4 02	4 03
March	11 80	11 03	13 43	13 30	3 41	3 14	4 12	4 20
April	11 48	10 98	13 54	13 34	3 32	3 07	4 13	4 07
May	11 03	11 15	13 44	13 54	3 26	3 03	4 21	3 98
June	11 03	11 15	13 59	13 59	3 03	3 03	4 10	3 97
July	11 40	11 40	13 63	13 63	2 95	2 95	3 76	3 76
August	10 98	10 98	13 49	13 49	2 73	2 73	3 60	3 60
Sept.	10 66	10 66	13 15	13 15	2 77	2 77	3 72	3 72
October	10 66	10 66	12 94	12 94	2 80	2 80	3 99	3 99
Nov.	11 23	11 23	13 09	13 09	2 96	2 96	3 99	3 99
Dec.	11 28	11 28	12 96	12 96	3 04	3 04	4 14	4 14
Year	10 88	10 88	13 29	13 29	2 98	2 98	3 94	3 94

Imports and Exports of Metals.

Port.	Week, June 17.		Year, 1897.	
	Expts.	Impts.	Expts.	Impts.
*New York.				
Aluminum, boxes	1,552	.....
Antimony ore, short tons	15	.....	473
" regulus, casks	474
Brass, old, short tons	826	.....	268
Copper, fine, long tons	1,548	2,213	33,189	4,032
" matte, "	4,469	111
" sulphate, "	830	.....	4,500
Ferro-manganese	160	.....	1,064
Iron ore	9
Iron, pig, bar, rod	872	10	5,048
" pyrites	5,570
Lead bullion	775	8,915	17,650
Manganese ore	28	29,984
Nickel	5	3,545
Rails, old	2,815	.....	125
Spiegeleisen	2,815	11,362
Steel, billets, rods	830	298	9,123
Tin	72	15	12,713
" dross	1,001
" and black plates, boxes	1,974	37
Zinc	1,585	41,793
" dross	16	.....	1,089
†Baltimore.				
Chrome ore, long tons	5,511
Copper, fine	855	.....	17,190
" sulphate	40	.....	1,527
Ferro-manganese	16	.....	2,434
Ferro-silicon	25
Iron ore	2,460	.....	69
" pig, bar, etc.	80	124,270
Lead	120	1,661
Manganese	300
Spiegeleisen	4,759
Steel	2,710	710
" wire, bundles	11	.....	1,507	920
Tin, long tons	641	7,513
" and black plates, boxes	3,777
Zinc, long tons	18,407
" dross	46
††Philadelphia.				
Antimony, casks	2,707
Copper ore, long tons	15,000
Ferro-manganese	48
Iron ore	6,830	.....	115,362
Manganese ore	3,350	.....	59,256
Tin	30	.....	348
" and black plates, boxes

*New York Metal Exchange returns. †From our Special Correspondent. ††Week ending June 11. †Week, June 10.

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 651.)

New York. June 18.

Heavy Chemicals.—A somewhat better business has been done during the past week, but the increase is by no means marked. Sales for forward delivery are still few because of possible changes that may yet be made in tariff rates. This is particularly true of bleaching powder. Chlorate of potash is now quoted at 9c., though sales have quite recently been made at 8½c.

We quote: Caustic soda, 60%, \$2.10@2.15; 70@76%, \$1.90@2 per 100 lbs. Alkali, 58%, 60c. for 50-ton lots and over, and 70@80c. for smaller quantities; alkali, 48%, \$1@1.20 for jobbing lots. Carbonated soda ash, 48%, 90@95c. per 100 lbs.; 58%, 75@80c. per 100 lbs. Bleaching powder, prime brands, \$1.75@1.87½; Continental, \$1.55@1.75 per 100 lbs.; Continental F brand, \$1.60@1.65. Bicarb. soda, English, 1.75@2c. per lb.; American, bulk, \$1.50@1.55 per 100 lbs., according to brand. Sal-soda, English, 60@65c. per 100 lbs.; American, 55@60c. (in barrels), and 75@80c. in kegs. Chlorate of potash, 9c. per lb.

Acids.—Business during the week has been more quiet, purchases being lighter, because July 1st is inventory time for most of the factories. Prices are unchanged. Quotations per 100 lbs. in New York and vicinity in lots of 50 carboys or over are as follows: Acetic acid, commercial No. 8 (in barrels), \$1.40@1.50; in carboys, \$1.50@1.65; redistilled, 28%, in bbls., \$1.70@1.80; in carboys, \$1.90@2.05. Muriatic acid, 18%, 75@85c.; 20%, 85@95c.; 22%, \$1.15@1.25, according to make and quantity. Nitric acid, 36%, \$3.50@4; 40%, \$4@4.50; 42%, \$4.50@5.50. Oxalic acid, \$7.25 ex-dock and \$7.50 ex-store. Mixed acids, according to mixture. Sulphuric acid, 66%, 85c.@1 in carload lots, 10@15c. higher for small quantities. Chamber acid, \$6@6.50 per ton at factory. Blue vitriol, \$4@4.25, according to grade and order.

Brimstone.—But little brimstone is in hand for spot sales, for which the quotation is \$20 per ton. Best unmixd seconds near-by are quoted at \$19½ per ton, and for shipment \$19. Thirds are 50c. per ton less.

Fertilizing Chemicals.—Business is reported quite good. Some large sales have been made, partly due to the cut in freight rates and to some buying through the South. As predicted in our last report, prices have already begun to advance, as will be seen below. We quote:

Sulphate of ammonia, gas liquor, \$2.12½ for shipment, and \$2.20 for spot; bone, \$2.05@2.10 per 100 lbs. Dried blood, high grade Western, \$1.60@1.65 per unit, New York; f. o. b. Chicago, \$1.40 per unit. Azotine, \$1.60 basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13%@15%, av. P₂O₅, 54@65c. per unit at sellers' works in bulk. Dissolved bone black, 17½@18% P₂O₅, 80c. per unit. Acidulated fish scrap, \$9.50, and dried scrap \$17.50@18. f. o. b. fish factory. Tankage, high grade, \$13.25 per ton; concentrated, \$1.30 per unit, f. o. b. Chicago; New York, \$18.50; low grade, \$16.50@17. Bone tankage, \$19@20; ground bone, \$21@23. Bonemeal, \$19.50@22.50. Sulphate of Potash: 90%, New York and Boston, \$1.69½; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: Quotations for 48@49%, less than 2½% chlorate, are 1.01@1.01½c., to arrive, and 1.02@1.03c. on spot; basis of 48%. High grade, 90@98% sulphate of potash, 1.96½@2.00½c. to arrive; basis of 90%. In bulk 24@36%, 36½@37½c. per unit O. P.

Muriate of Potash: We quote: New York and Boston, 1.75@1.78c. Philadelphia and Norfolk, 1.76@1.79½c.; Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, 1.78½@1.81c. in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12¼% actual potash, equivalent to 23% sulphate of potash, \$9.25. Actual weights, ex-vessel at port of New York per ton of 2,240 lbs. (testing as before), \$9.50.

Nitrate of Soda.—Lower quotations are given this week for spot sales, with the demand as limited as for some time. Quotations are 1.75@1.80c. for spot; 1.75c. to arrive, and 1.67½@1.70c. for shipment.

Charleston, S. C.

(From Our Special Correspondent.)

Shipments of fertilizers from this port from September, 1895, to April, 1896, and from September, 1896, to April, 1897, were as follows:

	Sept., '95-Apr., '96.	Sept., '96-Apr., '97.
Charleston & Savannah R.R.	78,322	99,428
Atlantic Coast Lines	30,555	74,067
South Carolina & Georgia	112,300	150,000
River steamers	4,931	4,798
Various	7,950	5,319
Total	253,158	333,612

It will be noticed that a material increase was made in the season from September, 1896, to April, 1897, over the preceding one.

Imports of fertilizing materials through this port from May 1st, 1896, to April 30th, 1897, were as follows: Brimstone, 6,370 tons, valued at \$109,186; pyrites, 33,105 tons, valued at \$97,524; kainit, 34,649 tons, valued at \$224,832; muriate of potash, 10,301,519 lbs., valued at \$174,885; sulphate of potash, 103,582

lbs., valued at \$1,850; manure salt, 1,159,872 lbs., valued at \$7,357; nitrate of soda, 2,451,291 lbs., valued at \$40,405; a total value of \$656,048.

Liverpool.

June 8.

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

Chemical manufacturers appear to be fairly busy, and the stoppage of plant this Whitsuntide is much less than usual.

Soda ash is in fair request. Quotations vary considerably according to export market, and nearest range for tierces may be called about as follows: Leblanc ash, 43%, £4 10s @£4 15s. per ton; 58%, £4 15s. @£5 per ton, net cash; ammonia ash, 48%, £3 7s. 6d. @£4 per ton; 58%, £3 12s. 6d. @£4 5s., per ton, net cash. Bags are 5s. per ton under price for tierces. Special quotations are given for American business. Soda crystals are in demand, and the general quotation is £2 17s. 6d. per ton, less 5% for barrels, and 7s. less for bags. Special quotations are made for American orders.

Caustic soda is in a firm position, and we quote spot range, as to market, about as follows: 60%, £6 3s. 9d. @£6 5s. per ton; 70%, £7 3s. 9d. @£7 5s. per ton, net cash; 74%, £8 2s. 6d. @£8 5s. per ton; 76%, £8 15s. @£9 5s. per ton, net cash.

Bleaching powder is moving off at £6 15s. @£7 per ton, net cash, for hardwood packages, as to destination.

Chlorate of potash has been in demand for early shipment to the United States and a considerable business reported. Makers are now cleared out for early delivery, while for June, for forward months, 3¼@4d. per lb. is about nearest range.

Bicarb. soda is meeting with the usual steady demand at £6 15s. per ton, less 2¼% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is firm at £7 17s. 6d. @£8 per ton, less 2¼% for good gray, 24% and 25% in double bags f. o. b. here, as to quality.

Nitrate of soda is dull and lower at £7 17s. 6d. @£8 per ton, less 2¼% for double bags, f. o. b. here, as to quantity and quality.

Carb. ammonia, lump, 3d. per lb.; powdered, 3¼d. per lb., less 2¼%.

Valparaiso, Chile.

May 8.

(Special Report of Jackson Brothers.)

Nitrate of Soda.—Although European advices have by no means been favorable and orders in the market very limited, the majority of producers have not been disposed to sell at the present prices. Transactions, therefore, have been small. We quote 95%, May to July delivery, at 5s. 4d.; August to October delivery, 5s. 5d., and refined nitrate, any delivery, 5s. 7d. @5s. 6½d., all sellers. The price of 5s. 4d., with 16s. 3d. freight, stands in 6s. 9d. per cwt., net cost and freight without purchasing commission. Reported sales for the fortnight were 583,000 metric quintals.

MINING STOCKS.

Complete quotations will be found on pages 650, 651 and 652 of mining stocks listed and dealt in at:

Baltimore.	Helena.	London.
Boston.	New York.	Mexico.
Butte.	Philadelphia.	Paris.
Cleveland.	Pittsburg.	Rossland.
Colo. Springs.	Salt Lake.	Shanghai.
Denver.	San Francisco.	Valparaiso.
Duluth.	Spokane.	

NEW YORK, Friday Evening, June 18.

The local mining stock market has awakened somewhat, and brokers are quite enthusiastic over what they call the coming boom, which they predict will be under way soon. The demand for mining stocks has strengthened considerably during the past week, the famous Leadville camp again coming to the front, owing to favorable reports from the different properties, coupled with reports of strikes both in the Little Chief and Leadville Consolidated properties. There were sales of 1,100 shares of Little Chief at 16@17c., and of Leadville Consolidated we note sales of 5,800 shares at 11@14c., with the closing price at 14c. bid.

Of the other Colorado stocks not in the Cripple Creek contingent there were sales of Chrysolite, Iron Silver, Lacrosse and Small Hopes.

The stock of the Miami Mining & Milling Company, capitalized at \$1,000,000, par value of share \$1, was listed on the Mining Exchange on June 16th, opening at 17½c. and advancing to 22c. to-day with sales of 27,600 shares. The property of the company is situated in Clear Creek County, Colo., and is supposed to contain the same kind of ore as is in the Stanley mine.

The Cripple Creek stocks command the usual portion of interest. The Comstock stocks were quiet. Of the Californian stocks Brunswick Consolidated sold down from 8c. to 6c., with sales of 3,800 shares. Plymouth Consolidated appears this week with sales of 800 shares at 12c. Standard Consolidated ruled steady at \$1.45@1.50.

Boston.

June 17.

(From Our Special Correspondent.)

The market for mining stocks this week has been very active with a higher level of prices, especially in the Montana stocks, which have been the leaders in the upward movement. Boston & Montana advanced from \$126 to \$129¼, with a reaction of \$1 only at the close of business yesterday. To-day being a local holiday the Exchange has been closed, and no business transacted. Butte & Boston had a sharp advance from \$17½ to \$22½, losing \$½ of it

at the close to \$21¼. The advance is the outcome chiefly of recent favorable developments at the mine and the good outlook for the property under the new management.

Old Dominion was taken hold of and advanced upon the prospects of the proposed railroad to the mine being carried out. It opened at \$15½ and good buying orders carried it up to \$18½, but in the later dealings it dropped off to \$17½, at which it closed.

The Lake Superior stocks were fairly active and generally higher. Calumet & Hecla broke its previous record and sold up to \$305 and closed \$385 bid; Quincy and Tamarack were both steady; the former sold at \$109, and the latter touched \$120, but the closing sale was at \$119, and that was bid. Osceola advanced from \$30 to \$32 and was \$31½ bid at close. Kearsarge was also strong and sold at \$18½, but closed at \$17¼. Franklin was \$1 higher at \$16, and Atlantic firm at \$20¼. Centennial was active, but the highest price of last week, \$8, was not maintained, the last sale being at \$7¼. Arnold was advanced from \$3 to \$3¼, closing \$3¾ bid. Tamarack, Jr., was in good demand and advanced \$1 to \$17. Wolverine steadily advanced on good buying from \$9¼ to \$10¼ and closed \$10¼ bid. A sale of Tecumseh was reported at \$2, the first for many weeks.

The gold and silver stocks were fairly active, without any material change in prices. Pioneer advanced ½ to ¾, losing the fraction later. Gold Coins sold up ½ to ¾. Santa Ysabel declined ½ to \$13, and Merced after selling at \$9 declined to \$8½. Napa Quicksilver sold at \$6¼.

Cleveland.

June 16.

(From Our Special Correspondent.)

The iron stock market has been quiet during the past week, and only one change in the quotations can be noted. The holders of Lake Superior ask \$1 more this week for their stock than they did ten days ago. The brokers expect a livelier market in the near future, when the season's business is under full sway.

Salt Lake City.

June 12.

(Special Report of James A. Pollock.)

Changes in the local mining stock market were not marked during the week and business did not improve materially. There was a constant demand for the gold stocks, however, and prices in that section were well sustained.

Anchor stock continued inactive and low. Alliance is absolutely featureless. No dividend has been declared on Bullion-Beck, but no change occurred in the stock. Buckeye was not active and recorded no change. The low price made on odd blocks of the Centennial Eureka proved very attractive, especially to holders of high-priced stock, and several buyers came in. All of the stock offered below \$40 absorbed and the close was higher. Chloride Point was featureless. Daton was fairly active at about unchanged quotations. Both of the Dalys remained quiet. Daly changed but little, while on the other hand Daly-West was slightly lower, as the result of the decision of the management to practically discontinue the production of ore while metal prices are so low and treatment charges so high. Dexter did very little business, and quotations remained unchanged. Eagle was quite active at fractionally lower figures. A slight increase in demand occurred in Four Aces, and some advance resulted. Geyser-Marion was in steady demand at last week's figures. Galena was practically unchanged. In connection with the Utah, the company is putting in new hoisting machinery, and production from both properties will necessarily be curtailed until the improvements are completed. Utah was somewhat stronger than its neighbor. Horn Silver was in better demand, but prices changed little. The development of Little Pittsburg has commenced in earnest. On account of the absence from the State of ail but one of the directors, the Mercur's June dividend was not officially declared until yesterday. The stock was in good demand, with only limited offerings, and prices ruled higher. Mammoth is again shipping some high-grade gold ore. The stock was somewhat lower on light offerings. Northern Light closed at about last week's figures. Ontario was again lower, probably through sympathy. Omaha was fairly active. Silver King paid its usual dividend on the 10th. Swansea has paid its June dividend, and the stock was about unchanged, while South Swansea was somewhat stronger. Considerably lower prices were made on Sacramento.

San Francisco.

June 12.

(From Our Special Correspondent.)

There was rather a heavy opening this week, with only a light demand for stocks. The fall in quotations was not as great as might have been expected; but it was comparatively easy to support prices on the limited amount of business done. The weekly reports from the Comstock showed nothing to help the market.

Later in the week there was a little spurt in the North End Comstocks, based on reports of the finding of some good ore in the Sierra Nevada mine. The buying was generally in small lots, but it served to strengthen prices. The quotations continued fairly steady, although the excitement passed over, because buying orders came in a little more freely than for some weeks.

Toward the close of the week there was renewed activity and stronger prices, the report of a strike in the Sierra Nevada being confirmed. Larger orders began to come in and the market had quite

a cheerful look. The buying eased off a little toward the end, but at the close there was rather a strong feeling all around.

Some prices noted are: Consolidated California & Virginia, \$1.75@1.80; Chollar, \$1.25@1.30; Confidence, 95c.@1; Ophir, 84@88c.; Potosi, 67@70c.; Sierra Nevada, 55@60c.; Best & Belcher, 53@56c.; Gould & Carry, 36@39c.

It is reported that several mining properties adjoining the Mariposa Estate have been bonded by representatives of the Exploration Company.

The Comstock mining companies paid the following sums for labor during the month of May, 1897: Hale & Norcross, \$1,300; Andes (estimated), \$900; Consolidated California & Virginia, \$10,354; Mexican, \$119; Ophir, \$2,012; Best & Belcher, \$2,131; Gould & Curry, \$1,027; Alta (estimated), \$1,200; Utah, 323; Occidental (estimated), \$1,500; Brunswick Exploration Company, \$7,142; Crown Point, \$1,240; Yellow Jacket, \$1,881; Confidence, \$544; Challenge, \$224; Belcher, \$2,978; Imperial, \$218; Savage, \$1,740; Bullion, \$1,020; Chollar, \$8,677; Potosi, \$1,227; Union Shaft, \$2,326; Sierra Nevada, \$755; Alpha, \$723; Overman (estimated), \$1,000; Caledonia (estimated), \$500.

Superintendent J. R. Ryan was put in possession of the Hale & Norcross mine Monday morning by virtue of a writ of mandate issued by the Supreme Court of Nevada. The writ was received from Carson and served on Superintendent Cronan the same morning, and the transfer of possession was made at once. The Grayson directors are now in control of the mine and all the property in Nevada.

It is said that a large party from this city will attend the Gold Mining Convention in Denver next month. If the convention proves a success they will try to secure a meeting in San Francisco next year.

The Champion Mining Company of Nevada City has declared a dividend of 25c. per share, payable June 15th.

Spokane, Wash. June 12.
(From Our Special Correspondent.)

With professional trading at a low ebb, and outside inquiries for mining stocks rather scarce, the Exchange was uninteresting this week. There were signs, however, of an attempt to increase valuations for the higher-priced securities. On the other hand, the transactions were not very large, and only a few stocks made up the dealings.

Noble Five Consolidated was sold at 45c. at the opening; on June 9th, 58½c. was asked for the stock, which is 14½c. more than the closing quotation last week. For some time past this stock sold at "private terms," and the last of such transactions was recorded about three weeks ago, when 95,000 shares changed hands.

Another stock which rose is Cariboo. At the opening this week buyers offered 45c., while sellers asked 49c., which price receded to 42c. on the following day, but advanced to 60c. asked on June 10th, against a bid of 40c. No sales were made, however.

Josie was offered at 48½@50c., without bids. Rambler-Cariboo was quoted at 44½@47c. on June 7th, and while speculators bid less for the stock as the week closed, holders asked several cents higher.

Some of our brokers are undoubtedly paying more attention to what is transpiring in the mining regions than to the business of the Stock Exchange. Their attendance on the board was not very regular this week, and it is feared that the interest of the public in stock speculation has begun to fade. In consequence of the light attendance it was decided yesterday to suspend the call and close the exchange for the present.

London. June 8.

The holidays have caused a temporary lull in the mining stock market. The Derby day and Whit-week reduce the attendance always, and as this year no external events to disturb the markets have occurred, the amount of business done has been exceedingly small. The South African section has suffered from inaction and the bears have been circulating all sorts of rumors about native risings in Rhodesia, differences between the Chartered Company's officers and the imperial executive, etc. On the other hand, the bulls came along later with reports of increased outputs for May in the Rand, and the few figures that arrived bore out their contention. In particular the increased output at Angelo caused a revival in the shares of that company and on those of its parent company, East Rand.

The adjournment of the Parliamentary inquiry into the Jameson raid, without eliciting any material facts, is generally considered bad for the market, as it seems to indicate that there is some secret understanding between Mr. Rhodes and the government. The presence of such a mystery makes people cautious in their dealings, for fear they stumble accidentally on some knowledge that will upset their plans. The only thing of value elicited by the committee has been the admission by Messrs. Rhodes and Beit that they financed and planned the revolution which was sent astray by Dr. Jameson's want of judgment. This everybody thought before, but the principal's admission of it makes it possible for everybody now to say it.

The West Australian market has been rather more active than the South African, but Kalgoolie (Hannan's District) shares have reacted after their recent undue inflation. Indians are strong as usual, but all other sections have generally been dull.

Among Americans perhaps Anacondas are the most hopeful. For some time, in fact, ever since their introduction here, there has been a weakness

in these shares, that has been unaccountable to those who have no view behind the scenes. The \$25 shares were introduced here at £7, but very few changed hands at that price except the first guaranteed batch. Ever since, one of the guarantors has had a continuous tap on at £6, so that it was, of course, impossible for the quotation to rise much higher. This tap is now nearly exhausted, and so, unless some other liquidator arrives, we may expect some accession of strength in the near future. The £10 Rio Tinto shares, paying a varying dividend of from 10% to 18%, have for some time been selling at from £20 to £25; so we might expect Anacondas, which pay a regular 10%, to go up to at least £8. It is evident also that Anaconda earns more than 10%, and is using its surplus profits in improving its plant, an expenditure which in the case of Rio Tinto would probably go to capital account. Altogether, therefore, without large liquidators, Anaconda should advance to nearer £10.

As regards new promotions in the mining market, the public do not seem to care for new mining companies at present. West Australian, New Zealand and African promotions have come to a dead stop, and British Columbians suffer in sympathy. The financial press certainly do their best to boom the new companies that came out to handle British Columbians, generally quite ignoring the question of the real value of the properties. But the deadness of the mining market and the absence of a British Columbia dividend-payer in London effectually bars the way to any public enthusiasm. One or two new companies have been formed during the last week to work in British Columbia, but they all appear to be intended as private companies, and not for flotation.

Firstly, the Slocan British Columbia & General Mining Syndicate has been formed to take over the options, etc., in British Columbia belonging to the Gresham Gold Exploring Syndicate. The prospectus is being circulated privately among the shareholders in the latter syndicate. This Gresham Syndicate was originally formed three years ago at the suggestion of Mr. William Gray, a mining man who has had considerable experience in Colorado. He got some of his fellow members at the Gresham Club to form themselves into the syndicate, with the object of sending him out to West Australia to find properties. Such properties as were obtained seem to have been failures, and in the end Mr. Gray and the directors came to loggerheads. Who is representing them in British Columbia I do not know. Another is the Highland Consolidated Gold Mines Syndicate, with a capital of \$125,000 to purchase the Highland claim, near Rossland, from D. D. Book & Company. Mr. Claude Vautin has some interest in this transaction.

A few weeks ago I wrote you about the British Yukon Chartered Company which it was proposed to form. Since then a good deal of opposition to the scheme has made itself felt, so that the directors have decided to reduce their ideas. The sole object at present is to develop communication with the Yukon gold diggings by opening the White Pass route. No desire is expressed to control the country or anything of that sort, so that the scheme now is of a much more reasonable nature than at first. I may mention that Sir William Dunn, the eminent South African merchant, is the promoter of the company.

Paris. June 6.
(From Our Special Correspondent.)

The chief talk of the week has been about the market for the South African gold stocks. Too many looked forward to a new boom when the revival of last month came, and hoped for a continued period of high prices. To close observers, however, it looked very doubtful. There did not appear to be the elements of a long sustained rise, and it was too sudden not to be followed by a quick reaction. A great deal of stock was brought out by the higher prices, but actual sales were not as large as might have been expected.

While the Transvaal situation appears better upon the whole there are still many elements of uncertainty about it, and there is a great deal to be done before the mining properties there can be put on a stable footing. Meantime it is not probable that any lasting rise in prices can be expected.

The copper shares are again stronger, and nearly all of them have advanced. Boleo has reached 1,900 fr., and appears likely to go above 2,000 fr.; this high price, indeed, seems to be justified by the recent report of the company, which showed very satisfactory returns for the past year. A good deal of interest is being taken here in Anaconda stock, and I hear that there has been some buying for French account. It is impossible to say exactly, since the stock is not yet listed here, and all the dealings in it are through London.

Huanchaca (silver) is recovering from its recent depression; the accounts from the mine are somewhat better. It is still evident, however, that a more active management is needed.

The metallurgical shares continue strong, and their business is reported still active, with every prospect of abundant returns for the year. The Committee on Marine of the Chamber of Deputies has recommended a credit of 250,000,000 fr. for the increase of the fleet, and this means still more work for the shipyards and steel works.

The movement of gold and silver in France for the four months ending April 30th is reported by the Ministry of Commerce as follows:

GOLD:	Imports.	Exports.	Excess.
	Francs.	Francs.	Francs.
1897.....	50,609,722	26,248,916	Im. 24,360,806
1896.....	89,666,439	62,675,065	Im. 26,991,374

SILVER:

1897.....	71,607,888	57,458,656	Im. 14,149,232
1896.....	61,565,065	37,649,201	Im. 23,915,864

Importations of minor coins—copper, nickel and bronze—this year amounted to 35,100 fr. at their face or coinage value; the exports of these coins were 8,494,100 fr. this year.

A bill lately passed by the Chamber materially increases the duties on lead. Ores carrying over 30% metal will pay from 1'25 fr. to 1'50 fr. per 100 kg.; lead not silver-bearing will be charged 3'50 to 4 fr. per 100 kg.; antimonial lead, 6'50 to 7 fr.; lead scraps and old metal, 3'50 to 4 fr.; lead pipe, sheets, etc., 6'50 to 8 fr.; electric accumulation, 16'50 to 21 fr.; lead ores and pig lead have been on the free list since 1892. The approximate consumption of lead in France is 80,000 tons annually; and the home production only 9,000 tons, but mining engineers claim that with higher duties the production might be increased to 33,000 tons. On the other hand it is said that the mines that pay for working are nearly exhausted, and that of 184 concessions for lead mines only 28 are worked or could be worked at a profit.

Political affairs do not seem to affect the market at present, though there is still an undercurrent of uneasiness.

Rossland, B. C. June 9.

The contract recently entered into between the Dominion and British Columbia Governments and the Canadian Pacific Railway, for the construction of what is known as the Crow's Nest Pass line, which may be briefly described as the "loop line," has strengthened confidence in this district. The line will pass through the Fort Steele and Wild Horse countries, which are now attracting attention. It will cross the Columbia at Trail, or near thereto, and then pass through Rossland and along the Boundary country to the present terminus of the Canadian Pacific-Okanagan system, at Penticton, which is situated at the foot of Okanagan lake.

This contract involves about \$15,000,000 when finally completed, and it is not unlikely that the line will be ultimately extended to a point on the present main line at or near Vancouver junction, thus largely doing away with the Frazer River route for passenger traffic, which has already been regarded as dangerous as well as very expensive to maintain.

This announcement comes opportunely, and it is very welcome news especially to those who have made large investments in Rossland and vicinity and who possess unbounded confidence in its future. The advance of this camp from the prospective to the development stage has not taken place without the many fluctuations incident to all gold mining camps. A number have left with disappointed feelings. A few who struggled to make Rossland their headquarters have changed to other parts of the district, notably to Kaslo, which gives some promise of its former activity.

Several of the most active and successful promoters of the camp are about to leave for England to present in person the public and private interests of this district. One or two have already left and as they are men of experience and reputation it is not unlikely that they will be successful.

It is not unlikely that an arrangement will shortly be made by which the Board of Trade in Rossland will have a mining exchange section which will be governed by the rules of the Board. The subject has been discussed with general approval, and it is believed that the influence of the Board of Trade would serve to regulate the dealing in stocks and to concentrate attention and interest in a way which would be of service to the mining interests.

MEETINGS.

Lady Marion Mining and Development Company, of Manitoba, Limited, annual meeting in Livingstone Block, Winnipeg, Manitoba, on July 10th at 2:30 p. m.

Parrot Silver and Copper Company, annual meeting in Butte, Mont., on June 29th at 11 a. m.

LATE NEWS.

GREAT WESTERN & GOLDEN CHARIOT.—These mineral claims are in the center of the town of Rossland. The development work up to about three weeks ago consisted of four shafts sunk to depths ranging from 25 to 50 ft., besides stripping the ledges. About three weeks ago systematic development began in the shaft of the Great Western, which was down about 50 ft., but was partly filled with water. This was removed by means of a Cameron pump. A Jenckes engine and 20-H. P. boiler, with steam drill and hoist, were installed and placed in charge of Mr. George Hunt. The work of sinking began as soon as the plant was ready, and a day or two since an ore vein was encountered giving assays running from \$22 to \$85. Seven large and different ledges are known to exist in the camp running past the St. Elmo, Le Roi and War Eagle. On one of these it is claimed that the Great Western and Golden Chariot are located. This ledge has been stripped for a considerable distance and it shows a width of 255 ft. It is on this ledge that the principal shafts have been sunk. The following named are the principal officers of the company: Louis Vertouneau, Spokane, president; H. M. Stevens, treasurer. The directors, in addition to the above named, are James B. Jones, Gen. Charles S. Warren and Robert Strickland, Spokane.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies like Alamo, Alice, Anaconda, etc., with columns for location, par value, and daily price changes from June 12 to June 18.

COAL AND INDUSTRIAL STOCKS.

Table of coal and industrial stock quotations, listing companies like American Coal, Col. C. & L. Dev., etc., with columns for location, par value, and daily price changes.

*Official quotations, New York Stock Exchange, mining 60 shares; other stocks 43, 175 shares; Consolidated Stock and Petroleum Exchange, mining 3, 230 shares; Mining Exchange, 164, 450 shares. Total shares sold, 24, 075. * Bid and ask quotations. † Ex-dividend

PITTSBURG, PA.* Week ending June 13.

Table of stock quotations for Pittsburgh, PA, listing companies like Allegheny, Carborundum, etc., with columns for location, par value, bid, ask, and selling price.

* Official quotations Pittsburg Stock Exchange.

PHILADELPHIA, PA.†

Table of stock quotations for Philadelphia, PA, listing companies like Cambria Iron, Choc. & Gt. Cts., etc., with columns for location, par value, and daily price changes.

† Official quotations Philadelphia Stock Exchange. * Bid and asked quotations. Total sales, 8, 232.

BOSTON, MASS.:

Table of stock quotations for Boston, Mass., listing companies like Aetna Con. q, Allouez, etc., with columns for location, par value, and daily price changes.

† Official quotations Boston Stock Exchange. * Bid and ask quotations. Total sales, 82, 212. † Ex-dividend. † Holiday.

BALTIMORE, MD.* Week ending June 17.

Table of stock quotations for Baltimore, MD, listing companies like Atlantic Coal, Big Vein Coal, etc., with columns for location, par value, bid, ask, and company name.

* Official quotations Baltimore Stock Exchange.

CLEVELAND, O.

Table of stock quotations for Cleveland, O, listing companies like Aurora, Chandler, etc., with columns for par value, bid, ask, and company name.

BUTTE, MONT. June 11.

Table of stock quotations for Butte, Mont., listing companies like Am. Dev. & M., Bald Butte, etc., with columns for par value, bid, ask, and company name.

HELENA, MONT.* - Week ending June 10.

Table of stock quotations for Helena, Mont., listing companies like Am. Dev. & M. Co., Bald Butte, etc., with columns for location, par value, bid, asked, shares sold, and price.

* Special Report of Samuel K. Davis. Total shares sold, 15,000.

SAN FRANCISCO, CAL.*

Table of stock quotations for San Francisco, Cal., listing companies like Alpha Con., Alta, etc., with columns for location, par value, and daily price changes.

* Official telegraphic quotations, San Francisco Stock Exchange.

STOCK QUOTATIONS.

DENVER, COLO.

Table of stock quotations for Denver, Colorado, listing companies like Adie C., Etina Gold, Agate, Anaconda, Aola, Arcadia C., Arg. J., Arg. J., Bangkok, Bankers, Big Johnny, Blue Jay, Bob Lee, B. Jonathan, Buckhorn, Cannon Ball, Champagne, Ch'p'razo, Colo Grant, C. C. Con., Dictator, Elkton, Fanny B., Finance, Forest R., G. F. Gr., G. F. Field, Geo. Wash, Gold Field, Gold Fleece, Gold Queen, Gold Stand, Gregory, Leasing, Hecla, Henrietta, Illinois, Insley, Internat'l, Iron Clad, Isabella, Jefferson, Kimberly, Ladessa, Mollie Gb., Monarch, Mt. Beauty, Old Gold, Orient, Portland, Peoples, Puritan, Q. Victoria, Royal Age, Santa Fe, Senator, Sentinel, Smuggler, Tamarack, Three H's, Union Gold, Van Fair, Va. M., W. C. Con., Wh. of For., Work.

*Official quotations Colorado Mining Stock Exchange. *Bid and ask quotations. Total shares sold, 1,731,530.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colorado, listing companies like Alamo, Anaconda, Arg'ntum, Banner, Bob Lee, C. & C. C., C. C. Con., C. C. Exp., Cross, Des Moines, Elkton, Fanny R., Favorite, Franklin, Gold Fleece, Gold & Gl., Ida May, Ingham, C., Isabella, Jack Pot., Marion, Matoa, Mollie G., Monarch, Mt. Rosa, Oriole, Pharmacist, Pilgrim C., Portland, Specimen, Trachyte, Union, Work.

*Official quotations Colo. Springs Mining Stock Assoc. Total shares sold: Listed, 218,558; unlisted, 1,900.

SALT LAKE CITY, UTAH. Week ending June 12.

Table of stock quotations for Salt Lake City, Utah, listing companies like Ajax, Alliance, Anchor, Annie, Bogan, Brick Con., Bullion Beck & C., Buckeye, Cental Eureka, Dalton, Dalton & Lark, Daly, Dex West, Dextet, Eagle, Four Aces, Galena, Geyser-Marion, Herschel, Horn Silver, Little Pittsburgh, Lucky Bill, Malvern, Mammoth, Mercur, Morgan, Northern Light, Ontario, Overland, Rover, Silver King, Sioux Con., Sunshine, Swansea, So. Swansea, Tetra, Utah, Utah Con.

*Special Report of James A. Pollock. †All the companies are located in Utah. †Ex-d'v.

SPOKANE, WASH.

Table of stock quotations for Spokane, Washington, listing companies like Butte, Cariboo, Celtic Qr., Com'nd'r., Delle, Deer Park, Even Star, G. Western, Hal Mines, High Ore, Iron Mask, Ivanhoe, Jeff Davis, Josie, Josie Mac, Le Roi, Mayflower, Monte Fria, N'be'veC, Novelty, O K, Paris Belle, Phoenix, Porman, Primrose, Rimbler C., Reco, Reservoir, Ross R.Mt., St. Elmo, Silverline, Virginia, W. Le Roi, White Bear, Wonderful, Unlisted: Dard'ne's, F. B. Prize, Helen, Idler, Little Giant, New York, Palouse B, Phoenix C., Scotia, Spokane B, Vulcan.

*Official quotations Spokane Stock Exchange. *Selling price. Shares sold: Listed, 21,925; unlisted, total, shares.

ROSSLAND BRITISH COLUMBIA. June 9.

Table of stock quotations for Rossland, British Columbia, listing companies like Alberta, B. Thre, Blue Bird, Bruce, Butte, California, Cariboo, Colonna, Comander, Delaware, Deer Park, Dunce, Eric, Evening Star, Giant, Great Western, Hattie B., Ibe, Idler, Ivanhoe, J. X. L., Le Roi, Lilly May, Mayflower, Montia, Monte Cristo, Morning Star, Nest Egg, Noble Five, North Belle, Novelty, O K, Palo Alto, Phoenix, Porman, R. M. C., Red Eagle, Red Mt. View, Red Point, Rhoderick Dhu, Ro stand R. M., Rossland Star, St. Elmo, St. Paul, Silver Bell, Silverline, Slocan Star, Sunset, Union, Virginia M., War Eagle, W Le Roi, Wonderful, Yale, Young Brit. Amer.

MEXICO. Week ending June 9.

Table of stock quotations for Mexico, listing companies like Almaz, Anstad y Concordia, Angustias, Arevalo y Anexas, Arradana y Anexas, Barragan y Cabras, Bartolome de Medina, Caberon y An, Candelaria de Pinos, Candelaria de Panuco, Candelaria de Chalch, Chapuzaya, Carmen, Castellana y San Ram, Cerro Colorado, Chihuahua, Luz de Borda, Luz de Maravillas, Pabellon, Palma, Purisima de las Com, Real del Monte, Refugio y Va, Restauradora, Rosario y Anexas, San Francisco, San Chalcabuites, San Rafael y Anexas, do. free stock, San Rafael del Oro, Sta. Maria de la Paz, S. Luis Potosi, Soledad, Soledad, Soledad, Sorpresa, Trinidad, Trinitad, Huasimog, Union, Zaragoza, Zomelahuacan (gold), Zona Min. de Posos.

NOTE.—In most of the older Mexican mining companies the shares have no fixed par value. The capital is formed of a certain number of shares, the total value not being named. Many new companies have a nominal par value, usually \$5 or \$10. Prices are in Mexican dollars.

STOCK QUOTATIONS.

LONDON.

June 5

Table of stock quotations for London, listing company names, countries, authorized capital, par value, last dividend, and quotations (buyers/sellers).

PARIS.

Week ending June 4.

Table of stock quotations for Paris, listing company names, countries, products, capital stock, par value, last dividend, and prices (opening/closing).

VALPARAISO, CHILE.*

May 8

Table of stock quotations for Valparaiso, Chile, listing company names, locations, capital paid, share value, last dividend, and prices.

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

SHANGHAI, CHINA.*

May 21.

Table of stock quotations for Shanghai, China, listing company names, countries, share values, last dividend, and prices.

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

DIVIDENDS.

Table of dividends for various companies, listing company names, current dividends, paid since Jan 1, 1897, and total to date.

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

ASSESSMENTS.

Table of assessments for various companies, listing company names, locations, no. of shares, date, and amount.

* New assessment.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table containing two columns: 'DIVIDEND-PAYING MINES' and 'NON-DIVIDEND-PAYING MINES'. Each column lists company names, locations, capital stock, shares, assessments, and dividends. The table is organized into two main sections with detailed sub-headers for each category.

G. Gold. S. Silver. L. Lead. C. Copper. B. Borax. * Non-assessable. † The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. ‡ Previous to the consolidation in August, 1884, the California had paid \$31,320,000 in dividends and the Cons. Virginia \$42,390,000. § Dividends paid since consolidation. ¶ Bodie, Bulwer and Mono transferred to Standard Cons., January, 1897. †† Dividends not been paid in several years. ‡‡ This table is corrected up to June 1. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

