



the cost of living. There is no reason why the miners and laborers of Colorado and Montana should be paid two or three times as much as their brethren in Minnesota, Michigan or Ohio.

The incendiary speeches at the convention seem to have had their effect already. It will be remembered that two years ago the State of Idaho organized military companies at Mullan and Wardner, in the Coeur d'Alene region, and these have done good service since in preserving order. Recently, the Commissioners of Shoshone County, who sympathize with the Union, petitioned the Governor to disband these companies, and now the news comes that the armory at Mullan, where one of the companies had its headquarters, has been broken open and the arms and equipments stolen. The members of the Union were simply taking their president's advice to arm themselves. What action will be taken we do not yet know; but the State of Idaho certainly owes its people a duty in the case, and should take prompt and vigorous measures to assert its authority and recover its arms. The question of rate of wages is one that will admit of discussion, and there are many arguments which can be advanced on both sides. But if the Western Federation of Miners is determined to declare war on society and public order, no discussion is possible, and the only question is how it can best be suppressed.

#### The Mineral and Metal Production of the United States in 1896.

In the *Engineering and Mining Journal* for January 2d, 1897, we presented a table giving the mineral production of the United States for 1896. In this table it was necessary to estimate in part the output of many substances for the closing months of the year, giving approximations only. Since then, the collection of returns from producers for Volume V. of *The Mineral Industry* has been nearly completed, and we are now able to present a full and corrected statement of the output of the mines and metallurgical works of the United States for the last year, with their values, generally taken at the place of production.

From this table, which is, we believe, the most nearly complete statement of our mineral production ever compiled or published, we find that the total value of the results of the mineral industry of the United States in 1896 reached the great sum of \$751,732,782, which compares with a similar total of \$732,941,518 for 1895. Of the total for 1896 we find that \$495,747,553 was the value of the non-metallic products, while \$255,985,229 was that of the metals. The former includes the sum of \$5,000,000 for the value of various minor products unspecified.

It is necessary to make some deductions from these totals for products which are necessarily duplicated in the table, such as iron ore used in making pig iron, coal used in making coke; lead used in making white lead; copper used in making copper sulphates and a few other less important items of the same class. Making the deductions required for these, we have as the total value of the production \$711,832,782 in 1896, as compared with \$687,941,518 in 1895; the change shown being an increase of \$23,891,264, or 3.5 per cent. for last year.

In nearly every case the full returns now obtained and presented have established the closeness of our approximations made at the close of the year. In some cases the figures have hardly been changed; in others the differences between the estimated first returns and the corrected statements amount to only a very small percentage of the total.

An examination of the table will show that we have been able to improve the form of presenting the facts each year, and to give the mineral production in greater detail. Thus the table on the adjoining page contains a list of 81 separate articles in all; while the list in Volume I. of *The Mineral Industry* enumerated only 54 separate items. This increase results from the much larger number of the reports received each year, and in part also from greater care in classifying and dividing the production.

The totals given are of values only, as no summing up of the quantities of such varied products could be possible. The statistics have been in almost all cases obtained directly from the producers—from the mines, the mills, the furnaces and the refiners—and have been compiled and arranged with great care. We do not, of course, claim absolute accuracy, which is impossible in any statistics; but we believe that these figures are fuller and more nearly accurate than any which have heretofore been collected or published in this country.

In accordance with our usual custom, we have added to the usual measurements of quantities in each case the metric measures, which we earnestly hope will soon be the only legal measure in this country, as they already are in nearly every other civilized country.

We find from the table that while there were in 1896, as compared with the previous year, decreases in some important items, such as iron ore and pig iron, there were substantial gains in other important articles. In gold, for instance, there was a large increase, and in copper also the production was much larger. The coal output showed very little change, much less than might have been expected.

The United States in 1896 was the largest gold producer of the world and the largest silver producer; it was also by far the largest producer

of copper, furnishing over one-half of the world's supply of that metal. Notwithstanding the decrease in the pig iron output it was still larger than that of any other country. In coal the total was still less than that of Great Britain, though it is gradually approaching the point where the two will be equal. In short, no other country in the world possesses a mineral industry of nearly as great value or variety. This is more remarkable also from the comparatively brief time in which the industry has been built up to its present proportions, and again draws attention to the energy and enterprise of our people, and to the ability of our mining engineers and metallurgists.

We give below brief summaries of the course of production during 1896:

#### METALS.

**Aluminum.**—The production of this metal remains in the hands of a single company, though recent patent decisions make it probable that the monopoly may be broken before long. The plant at Niagara Falls has made it possible to cheapen production and lower prices. An enlargement of the works has been required to meet the demand.

**Antimony.**—Production shows an increase, though the total is still small. The ore mined was from California; nothing was done in the Idaho mines during the year.

**Copper.**—The production for 1896 reached the largest total ever reported, 467,822,923 pounds, equal to 208,850 long tons, or 212,201 metric tons. Over half of the production was sent abroad, the shipments to foreign countries amounting to no less than 125,605 long tons, or 59.2 per cent of the output. Had it not been for an extraordinary foreign demand the production of copper must have been very much curtailed, instead of showing, as it did, an increase of 81,369,123 pounds, or 21.1 per cent. The foreign demand also kept up the average price, which was 10.88 cents per pound for Lake copper in New York, against 10.76 cents in 1895. This price is probably about half a cent above the general average for the metal, when the large sales of electrolytic and casting copper are considered.

**Gold.**—Activity in the older mining regions of California and other States and the increased production of Cripple Creek and of some minor districts in Colorado, with improvements in several other States and in the territory of Alaska, carried the gold production up to \$58,660,727, showing an increase of \$11,830,527 over 1895. The gain was not the result of new discoveries, which were few in number and generally of slight importance; it came rather from more extensive and better working of old mines, and from increased skill and care in treating the ores. The districts which attracted most attention during the year were Cripple Creek in Colorado; the new Randsburg Mining District in Southern California; the Mercur District in Utah; the De la Mar Mines in Nevada, and the mines of Alaska. In the latter there were many reports of new mines and a number of men went to the Yukon placers, but their success has been varied.

**Iron.**—The iron trade showed a reaction from the activity of 1895, and there was a decrease in the production of pig iron of 823,181 tons, or 8.8 per cent. There was a corresponding reduction in steel and finished iron in nearly all forms. The average price showed also a decrease. The year was one of extremely low prices in iron and steel; in fact their range was regarded as the lowest possible until 1897 opened. The most notable fact of the year was the beginning of an export trade in iron and steel, which promises to reach large proportions.

**Lead.**—The production of lead in 1896 in the United States was 174,792 short tons (158,271 metric tons), an increase over 1895 of 17,938 short tons, or 11.4 per cent. This was made in spite of the closing of the Leadville mines in Colorado nearly half the year by the great strike, and the result was due chiefly to the activity in the Missouri, Kansas and Idaho mines.

**Platinum.**—The small production of platinum is from California, and metal is obtained in parting and refining gold bullion, chiefly at the San Francisco Mint. In addition to this production there is a considerable amount obtained in this country from nickel matte brought from the Sudbury mines in Canada. This platinum has not yet been refined and put on the market.

**Quicksilver.**—The total production of quicksilver was 33,180 flasks, showing a small decrease—798 flasks—from that of 1895. The supply continues to come entirely from the California mines.

**Silver.**—The production of silver showed a large increase over the previous year, the total refined or obtained from our own ores having been 56,222,322 fine ounces, or 9,891,087 ounces more than in 1895. In addition to this product there was obtained by our smelters and refiners from foreign ores and bullion—chiefly from Mexico and British Columbia—33,053,555 ounces, making the total quantity of silver put into marketable form 89,275,877 ounces.

**Zinc.**—The output of metallic zinc or spelter in 1896 was 77,637 short tons or 70,432 metric tons, and was less than that of 1895 by 4,221 short tons; or 5 per cent. This decrease was divided among the different producing districts, and was the result chiefly of limited demand for the metal. Our producers are able to increase the supply largely, if a market can be

found for it. New uses for the metal, especially for roofing, have been suggested and ought to be furnished.

NON-METALLIC PRODUCTS.

Abrasives.—Under this head are included a number of substances, most of which show comparatively small changes. Carborundum shows

undeveloped. In grindstones, millstones and whetstones there were no important changes. The demand for millstones has been largely reduced in recent years by the use of improved processes for making flour from grain.

Alum.—There was a decrease of 40,200 short tons, or 34 per cent. in the

MINERAL PRODUCTION OF THE UNITED STATES IN 1895-6.

Compiled for THE MINERAL INDUSTRY, Vol. V.,

By Richard P. Rothwell, editor of the Engineering and Mining Journal.

Number.	Products.	Customary Measures.	1895.				1896.			
			Quantity.		Value at Place of Production.		Quantity.		Value at Place of Production.	
			Customary Measures.	Metric Tons.	Totals.	Per M. Ton.	Customary Measures.	Metric Tons.	Totals.	Per M. Ton.
NON-METALLIC.										
Abrasives:										
1	Carborundum.....	Sh. T.	113	102	\$67,800	\$86.65	595	550	\$365,612	\$86.65
2	Corundum.....	Sh. T.	885	349	53,900	154.44	250	227	25,000	153.75
3	Emery.....	Sh. T.	1,700	1,542	119,000	77.17	1,550	1,406	108,500	77.17
4	Garnet.....	Sh. T.	877	735	39,465	49.65	2,842	2,578	96,628	37.48
5	Grindstones.....	Sh. T.	36,389	33,004	290,378	8.79	31,901	28,396	294,398	10.36
6	Millstones.....	Sh. T.	1,783	1,617	15,925	.....	2,425	2,199	14,859	.....
7	Tripoli & inf. earth.	Sh. T.	.....	.....	26,049	16.00	.....	.....	31,028	14.55
8	Whetstones.....	Sh. T.	.....	.....	93,303	.....	.....	.....	105,201	.....
9	Alum.....	Sh. T.	117,900	106,959	3,587,000	33.07	77,700	70,489	2,381,000	33.07
10	Antimony ore.....	Sh. T.	1,083	982	37,905	38.60	150	136	4,750	34.92
Asbestos and talc:										
11	Asbestos.....	Sh. T.	664	602	11,837	19.66	716	650	12,670	19.49
12	Soapstone.....	Sh. T.	22,133	20,097	342,298	17.03	24,319	22,068	265,806	12.05
13	Talc, fibrous.....	Sh. T.	40,000	36,368	320,000	8.80	45,000	40,824	315,000	7.70
14	Asphalt.....	Sh. T.	25,525	23,156	170,500	7.96	20,500	19,926	66,900	3.36
15	Asphaltic limestone.	Sh. T.	5,550	5,035	16,650	3.31	8,119	2,829	8,714	3.08
16	Bituminous sandstone.	Sh. T.	42,374	38,542	139,945	3.63	53,119	48,189	138,714	2.66
17	Barytes.....	Sh. T.	20,255	18,371	99,020	5.39	21,500	19,504	86,000	4.41
18	Bauxite.....	L. T.	18,800	19,100	56,400	2.90	17,096	17,369	68,384	3.93
19	Borax.....	Lbs.	13,506,356	6,126	742,850	j.12	15,258,014	6,921	768,900	j.11
20	Bromine.....	Lbs.	394,854	179	102,662	j.57	550,285	249	143,074	j.57
21	Cement, nat. hydraul.	Bbls	7,694,053	1,047,006	4,597,285	4.39	7,454,611	1,014,423	4,353,377	4.29
22	Cement, Portland.....	Bbls	749,059	135,879	1,430,089	10.52	1,082,654	187,365	1,710,151	9.12
23	Clay, refractory.....	Sh. T.	3,750,000	3,402,000	4,500,000	1.35	4,000,000	3,628,800	4,800,000	1.32
24	Clay, china.....	Sh. T.	30,910	28,035	258,431	9.22	29,418	26,688	217,551	8.15
25	Clay, common.....	Sh. T.	.....	.....	160,100,000	.....	.....	.....	165,000,000	.....
26	Coal, anthracite.....	Sh. T.	51,897,297	47,081,208	80,250,652	1.71	48,855,563	44,321,768	88,105,837	1.98
27	Coal, bituminous (h).	Sh. T.	137,328,600	124,584,506	123,867,958	1.00	138,468,254	125,618,864	115,827,813	0.93
28	Coal, cannel.....	Sh. T.	69,747	63,274	191,804	3.03	54,650	49,587	146,488	2.95
29	Coke.....	Sh. T.	12,493,464	11,393,996	19,018,276	1.68	10,357,000	9,305,809	17,267,401	1.84
30	Cobalt oxide.....	Lbs.	6,400	3,903	8,640	j.80	12,825	5,817	16,672	j.28
31	Copperas.....	Sh. T.	14,118	12,805	69,846	5.45	11,170	10,133	52,662	5.19
32	Copper sulphate.....	Lbs.	45,000,000	20,412	1,750,000	85.73	48,732,840	21,605	1,949,313	90.22
33	Chrome ore.....	L. T.	1,533	1,578	16,795	10.64	702	713	7,775	10.90
34	Feldspar.....	L. T.	22,195	22,550	104,082	4.67	22,199	22,554	112,829	5.00
35	Fluorspar.....	Sh. T.	4,000	3,628	24,000	6.61	4,000	3,628	24,000	6.61
36	Gilsonite (k).....	Sh. T.	1,150	1,043	34,500	32.12	1,700	1,542	54,500	35.34
37	Graphite, crystalline.	Lbs.	377,450	172	17,286	j.50	405,006	184	18,225	9.90
38	Graphite, amorphous.	Sh. T.	840	762	4,700	6.17	574	520	3,850	7.40
39	Gypsum.....	Sh. T.	298,572	270,864	974,219	3.59	231,649	210,352	739,790	3.52
40	Iron ore.....	L. T.	15,988,950	16,243,890	27,674,900	1.72	14,650,000	14,884,400	28,567,500	1.92
41	Lime.....	Bbls	160,000,000	5,443,164	30,000,000	.....	160,000,000	5,443,164	30,000,000	.....
42	Magnesite.....	Sh. T.	2,200	1,995	14,700	7.39	2,067	1,875	13,435	7.16
43	Manganese ore.....	L. T.	170,509	173,337	328,107	1.84	162,526	165,126	339,083	2.05
44	Mica, ground.....	Lbs.	740,000	335	31,956	95.40	877,000	398	37,711	94.75
45	Mica, sheet.....	Lbs.	6,200	3	6,400	j2.13	8,000	4	8,405	j2.31
46	Mineral wool.....	Sh. T.	6,939	6,340	74,962	11.36	5,953	5,400	61,714	11.43
47	Monazite.....	Lbs.	1,900,000	862	114,000	132.40	17,500	8	875	109.37
48	Natural gas.....	.....	.....	.....	12,000,000	.....	.....	.....	10,000,000	.....
49	Paints, mineral.....	Sh. T.	47,084	42,705	1,086,767	25.45	54,153	49,227	973,268	19.77
50	Paints, vermilion.....	Sh. T.	118	107	118,190	1105.00	96	87	94,677	1088.25
51	Paints, white lead.....	Sh. T.	92,939	84,314	8,768,656	104.00	95,068	86,246	7,862,267	90.46
52	Paints, zinc oxide.....	Sh. T.	22,620	20,496	1,588,300	77.43	16,739	15,240	1,259,925	82.67
53	Petroleum (crude).....	Bbls	52,931,943	7,215,896	47,624,913	6.60	61,396,394	8,364,631	56,963,137	6.81
54	Phosphate rock.....	L. T.	1,008,017	1,015,587	3,296,737	3.25	863,754	877,574	2,591,262	2.93
55	Marls.....	L. T.	217,700	221,183	587,790	2.67	155,000	157,480	418,500	2.65
56	Precious stones.....	.....	.....	.....	250,000	.....	.....	.....	200,000	.....
57	Pyrites.....	L. T.	107,731	109,088	342,587	3.14	117,782	119,666	297,853	2.49
58	Salt, evaporated.....	Bbls	12,091,265	1,535,591	5,643,283	3.61	11,156,270	1,416,846	4,828,179	3.41
59	Salt, rock.....	Bbls	2,184,589	277,443	828,954	2.98	2,198,303	279,184	711,919	2.55
60	Silica, sand & quartz.	L. T.	523,640	532,018	553,128	1.04	720,399	732,925	1,076,088	1.46
61	Slate, roofing.....	Sq'es.	752,606	298,576	2,494,213	10.45	699,100	221,615	2,260,862	10.25
62	Slate, manufactures.	.....	.....	.....	392,877	.....	.....	.....	467,575	.....
63	Soda, natural.....	Sh. T.	1,900	1,724	47,500	27.56	3,000	2,722	65,000	23.88
64	Soda, manufactured.	M. T.	.....	.....	167,000	33.00	.....	.....	158,975	3,656,425
65	Stone, limestone (flux)	L. T.	4,723,154	4,798,724	1,889,302	.....	4,311,563	4,390,548	1,724,635	.....
66	Stone, marble.....	Cu. ft.	1,300	91	2,888,114	.....	.....	.....	2,600,429	.....
67	Stone, onyx.....	Cu. ft.	1,300	91	12,000	131.87	3,000	228	24,000	105.26
68	Stone, oolitic.....	Cu. ft.	4,790,422	365,108	1,005,192	2.75	4,040,999	308,111	755,891	2.45
69	Other building stones	.....	.....	.....	26,269,943	.....	.....	.....	27,219,484	.....
70	Sulphur.....	L. T.	1,650	1,676	41,250	24.60	2,800	2,845	64,200	22.56
71	Est. prod. unspecified	.....	.....	.....	5,000,000	.....	.....	.....	5,000,000	.....
Total non-metals.....			.....		488,651,351	.....	.....		495,747,553	.....
METALS.										
72	Aluminum.....	Lbs.	900,000	408	495,000	j.25	1,300,000	590	520,000	j.18
73	Antimony.....	Sh. T.	466	422	70,332	166.42	613	556	85,700	154.32
74	Copper (m).....	Lbs.	386,453,850	175,394	40,616,300	231.70	467,822,973	212,201	49,729,582	234.35
75	Gold.....	Ozs. f	2,265,612	770,478	46,890,200	1664.60	2,837,965	788,272	58,660,637	7664.60
76	Iron, pig.....	L. T.	9,446,308	9,597,440	108,632,542	10.77	8,623,127	8,761,120	91,577,610	10.45
77	Lead, value at N. Y.	Sh. T.	156,854	142,398	10,132,768	71.20	174,792	158,271	10,381,843	65.59
78	Platinum.....	Ozs. f	150	j.4.66	2,250	492.83	200	j.6.21	2,800	450.89
79	Quicksilver.....	Flksg	33,978	1,179	1,313,589	1114.00	33,180	1,151	1,227,660	1066.00
80	Silver, comm'l value.	Ozs. f	46,331,235	1,441,087	30,254,296	30.99	56,222,322	1,748,710	37,725,178	21.57
81	Zinc.....	Sh. T.	81,858	74,245	5,942,800	80.04	77,637	70,432	6,074,219	86.24
Total metals.....			.....		244,230,167	.....	.....		255,985,229	.....
Grand totals.....			.....		732,881,518	.....	.....		751,732,782	.....

(a) Barrels of 300 lbs.; (b) 400 lbs.; (c) 200 lbs.; (d) 42 gals.; (e) 280 lbs.; (f) Troy ounces; (g) Flasks of 76 1/2 lbs. (h) Bituminous coal includes brown coal and lignite. The anthracite production is the total for Pennsylvania, Arkansas, and Colorado. (i) Estimated. (j) Kilograms per kilogram. (k) Including bitumen from Texas. (m) The value of the copper production is calculated at 0.25c. per lb. less than the average price of Lake copper at New York. Abbreviations: Sh. T., short tons (2000 lbs.); L. T., long tons (2240 lbs.); M. T., metric tons (2204.6 lbs.); Sq'es, squares (100 sq. ft., lapped and laid).

an increase; its use is extending in different quarters as the material becomes better known, and the manufacturers of this artificial abrasive are arranging to extend their output. Corundum comes chiefly from North Carolina and Georgia and shows a small decrease. The output of emery increased slightly, but we are still largely dependent upon imported supplies of this article. The supply of tripoli and infusorial earth continues to come mainly from the Missouri deposits, those in Florida being still

undeveloped. In grindstones, millstones and whetstones there were no important changes. The demand for millstones has been largely reduced in recent years by the use of improved processes for making flour from grain.

Asbestos and Talc.—There was little change in the production of asbestos, and we continue to import a considerable quantity from Canada. The output of fibrous talc showed little change also, no new producers having come into the market. The lower grades of talc and the soapstone show also no material difference.

**Asphaltum and Bituminous Rock.**—A change has been made in our table this year, asphalt, asphaltic limestone, bituminous rock and bituminous sandstone being reported separately as being products of distinct grade and different uses, whereas in most returns they are given together under a single head. The production, upon the whole, shows little change; that of asphalt decreased, as did asphaltic limestone, but there was an increase in bituminous sandstone.

**Barytes.**—No material change is noted in this product, an increase of 1,245 short tons only being shown.

**Bauxite.**—The production of bauxite, 17,096 tons, which was entirely from the Georgia mines, shows a decrease.

**Borax.**—There was an increase of 1,751,658 pounds in the production. The greater part now comes from the mines in Southern California, the Nevada marshes being worked only to a limited extent. The business is still in the hands of a single producer, the Pacific Coast Borax Company, which in 1896 consolidated with the Redwood Chemical Works of Great Britain. The consolidated company practically controls the borax output of the world.

**Bromine.**—An increase of 155,431 pounds, or nearly 40 per cent., is reported in this product, the total amount still being limited by the demand, which increases slowly.

**Cement.**—The cement producers reported in 1896 a decrease of 139,442 barrels in the production of natural hydraulic cement. This was more than made up, however, by an increase of 283,595 barrels in Portland cement. This would indicate a production slightly increased in 1896, and a growing demand for the manufactured or Portland cement.

**Clays.**—The clay industries are of very considerable importance in the aggregate, but are very largely in the hands of small producers or manufacturers, scattered all over the country, thus making the collection of statistics a difficult matter. We find in 1896 a gain in the production of refractory clays and firebrick. In china clay or kaolin there was a small decrease only.

**Coal and Coke.**—The total coal production in 1896, with a possible modification in the Ohio figures, was 187,373,477 short tons, showing a decrease of 1,922,167 tons, or 1 per cent., as compared with 1895. The decline was wholly in anthracite, the output of which decreased 3,041,734 tons, or about 6 per cent. In bituminous coal there was less change than might have been expected in a year of business depression and lessened industrial activity, a gain of 1,134,654 tons being noted. There was a drop in values exceeding the change in production, owing to the very low average price realized. Coal sold at the mines in many parts of the United States at lower prices in 1896 than had ever before been accepted. Heavy production and sharp competition in a year of comparatively light demand were responsible for this result. Unfortunately, there appears to be little prospect for relief for the coal operators. In such a condition the districts which produce at the lowest cost and are best situated in relation to the markets will certainly secure the trade and others must suffer.

Coke showed a total production of 10,357,000 short tons, a decrease of 2,136,464 tons, or 17.1 per cent., from 1895. The coke trade is so dependent on the demand from the iron furnaces that its changes follow very closely those in iron production. The only matter worthy of note is the beginning of a movement which may in time transfer the chief center of coke production from Western Pennsylvania to West Virginia. Some progress was made in 1896 in the introduction of by-product coke ovens.

**Cobalt Oxide.**—The production in 1896 was about double that of the preceding year.

**Copperas.**—The production shows a slight decrease, as was to have been expected; the difference amounted to about 3,000 short tons.

**Copper Sulphate.**—The production was about the same in 1896 as in the preceding year. The exports of this material are considerable, and the demand is well maintained.

**Chrome Ore.**—The output, which comes entirely from the California mines, was only about one-fourth of that reported in 1895. Our principal supplies of chrome ore for Eastern manufacturers continue to come from abroad.

**Feldspar.**—There was very little change in the production of this mineral.

**Fluorspar.**—The estimated output of 4,000 tons of the Argyle Fluorspar Company for 1896 is about the same as that of the preceding year.

**Gilsonite.**—The production from the Utah mines was 2,650 tons, showing a large comparative increase, though the total is still small. The question of opening to location the gilsonite deposits on the Uncompahgre Indian Reservation in Utah is still unsettled.

**Graphite.**—An increase of 27,556 pounds is reported in this mineral. A further gain may be expected in 1897 from a promising deposit recently opened in Rhode Island. There was a decrease in the small production of amorphous graphite, which is used for foundry facings.

**Iron Ore.**—The decrease of 1,338,000 tons corresponded nearly to that in pig-iron production. The stocks of ore on hand at the opening of the year were generally light,

**Lime.**—The production showed comparatively little difference from that of the preceding year.

**Magnesite.**—But little change is shown in the output of this mineral, which continues to come almost entirely from the California mines. Most of the product is also used on the Pacific Coast. The total in 1896 was 2,067 short tons.

**Manganese Ore.**—The total production in 1896, including manganiferous iron ores, amounted to 162,526 long tons, and was 7,983 tons less than in 1895. A large quantity of manganese ore is still imported.

**Mica.**—The production in 1896 included 8,000 pounds of sheet mica and 877,000 pounds of ground mica. This comes chiefly from the North Carolina and New Hampshire mines. The production does not yet equal the demand, which is increasing, especially for electrical work.

**Mineral Wool.**—The production last year was 5,953 tons, showing a decrease of 15 per cent.

**Monazite.**—The output, which was stimulated largely in 1895 by the new demand for the mineral, amounted in that year to 1,900,000 pounds, but in 1896 it fell off to 17,500 pounds.

**Natural Gas.**—There was a decrease in value of this product, owing to the partial exhaustion of the supplies in certain districts.

**Paints.**—In mineral paints, chiefly the iron oxide paints, there was a considerable increase, the total in 1896 being 54,153 short tons. Of vermilion only 90 tons were reported. The production of white lead was large, reaching 95,038 tons in 1896, or 2,129 tons more than in 1895. Zinc white, on the other hand, decreased in production, the total of 16,799 tons reported being less than that for 1895 by 5,891 tons. It may be noted that most of the zinc white is made directly from the ores, and not from metal like white lead.

**Petroleum.**—The production of crude petroleum was 61,396,394 barrels, or more than that of 1895 by 8,434,451 barrels. No new fields of importance were discovered during the year, but there was considerable extension of work in the West Virginia field. The value of the new oil-field in Tennessee is not yet determined.

**Phosphates and Marls.**—A heavy decrease in the production of phosphate rock is shown, due to the closing down of many of the South Carolina and Florida producers on account of low prices and light demand for export. The new phosphate fields in Tennessee promise well, but their production has not yet reached an important amount. The total output of phosphate rock in 1896 was 863,754 tons; of marl 151,000 tons.

**Precious Stones.**—A value of \$200,000 is given to our production, which varies but little from year to year.

**Pyrites.**—The total production, chiefly from the mines of Virginia and Massachusetts, was 117,782 long tons, an increase of 10,051 tons. This was, perhaps, less than might have been expected in view of the high price of sulphur, which would naturally lead to an increased use of pyrites in acid making.

**Salt.**—The total output in 1896 was 13,354,573 barrels (of 280 pounds); 11,156,270 barrels being salt obtained from brine by evaporation, and 2,198,303 barrels rock salt. There was a slight decrease from 1895.

**Silica, Sand and Quartz.**—The production of 720,399 long tons was larger than in the preceding year.

**Slate.**—The total value of slate, roofing and manufactured, was \$2,728,437, a small decrease from the preceding year, but less than was anticipated in a year when building was not active.

**Soda.**—The production of manufactured soda in 1896 was 158,975 metric tons, or 8,025 tons less than in 1895. This was due entirely to the depression of business and consequent decreased demand. The production of natural soda from Wyoming—3,000 tons—continues small owing to the remoteness and difficulty of access of the deposits.

**Stone.**—Under this head are included several classes of products, all of which showed a decreased output; building stones also. This was naturally the case in a dull year when new building enterprises were limited in their extent. The stone industry is one of those in which it is very difficult to obtain correct statistics, owing to the great number of small quarries in all parts of the country, which are worked irregularly to supply local demands. The value of the products of such quarries is considerable in the aggregate. Onyx, a stone used entirely for ornamental purposes, showed an increase, 3,000 tons having been quarried. Limestone used for flux in iron making showed a decrease.

**Sulphur.**—A small production—2,800 tons—is reported from Utah and Louisiana. The mines in the latter State were worked only to a very small extent and irregularly. The higher price of Sicilian sulphur should aid to develop the industry, and arrangements are in progress to work the Texas deposits, which are believed to be of considerable extent and value.

**Other products.**—Although our list has been extended year by year, as noted above, and has been made with great care, there remain a number of minor products which it is difficult or impossible to classify. The value of those is in most cases small, but their total reaches a considerable sum; and we believe that the \$5,000,000 allowed to cover it is really a very conservative estimate.

## NEW PUBLICATIONS.

**THE WORKSHOP MANUAL AND COMPENDIUM OF USEFUL INFORMATION.** Compiled by John J. Davies. Chicago; The American Artisan Press; pages 250; illustrated. Price, \$1.

This is a compilation of all sorts of hints and directions intended chiefly for workers in sheet metal. It contains much that is useful, and is superior to most books of this class because it has been evidently edited and arranged with care, and with due regard to the convenience of the reader. It has also been supplied with a very good index, which much increases its usefulness.

**METALS: THEIR PROPERTIES AND TREATMENT.** By A. K. Huntington and W. G. McMillan. London and New York; Longmans, Green & Company. Pages, 564; illustrated. Price, \$2.50.

This is a new edition of a condensed hand-book first compiled by Prof. C. L. Bloxham, 1872; rewritten by Mr. Huntington in 1882, and now again rewritten by Messrs. Huntington and McMillan. Naturally the great progress in metallurgy in 15 years made many changes and additions necessary, and it would probably have been wiser to rewrite the book entirely, dropping what had become obsolete. The retention of the old matter seems unfortunate when we consider the extent of the subject and the amount of condensation required to even attempt to write of all the ordinary metals in a single book. It is due to the revisers to say that they have evidently tried to bring the book up to date and to use the latest authorities. That it is not more nearly complete is due to the limitation of space and the impossibility of covering the subject. The main object in view has been to present the development of the metallurgical arts and industries, avoiding too much detail, which would only tend to obscurity in meaning.

**POCKET MANUAL OF READY REFERENCE.** Compiled and arranged by P. J. Haltigan. New York; Excelsior Publishing Company. Pages, 160. Price, 50c.

This little book was prepared for the use of copy editors, proofreaders, compositors, typewriters, students of law, newspaper reporters and others connected with literary work in general. It contains a finger-indexed vocabulary of double words from Webster's International Dictionary, to which 31 pages are devoted; over 500 Latin and French words, legal phrases and colloquial expressions, with their definitions; an alphabetical list of contractions and abbreviations commonly met with in writing and printing; a complete list of county names in the United States arranged alphabetically by States; the Declaration of American Independence, with the names of the signers; Constitution of the United States, with amendments and dates of ratifications, and a collection of miscellaneous information suitable for reference. There is also an index of four pages devoted to the Constitution of the United States, besides one for general subjects. The table of foreign coins on page 120 is hardly specific enough. There are several blank pages at the end of the book which may be used in making memoranda. The book is neatly printed, well bound, and can be carried in the pocket conveniently.

**THE MATERIALS OF CONSTRUCTION.** By J. B. Johnson. New York; John Wiley & Sons, and London; Chapman & Hall. Pages, 788; illustrated. Price, \$6.

This work has been promised for some time, and its appearance has been looked for with interest, since there is certainly a place for such a book, of convenient size and kept within reasonable limits. The strength and other qualities of different materials are treated incidentally in various engineering works; but the subject has hardly been treated fully anywhere in one book. The results of investigations by individual engineers, commissions and other official bodies are scattered through reports, technical papers, the proceedings of societies and similar publications, and it is no easy task to find the information needed, even if it is accessible at all. The simple collection and digestion of such material is a work of much service to engineers.

Necessarily the work is largely a compilation, and Professor Johnson freely acknowledges his indebtedness to various sources, giving everywhere references to his authorities. Such a compilation is no easy task, and even the selection of the tests to be adopted involves a considerable amount of labor and study. There are tests and tests; and it is sometimes a difficult matter to know which are the reliable ones. It is true that there has been a great advance in the science of testing since Professor Johann Bauschinger first began to point out the correct principles and methods to be followed; but it is to be feared that there is still some careless and inaccurate work done which finds its way somehow into print and is recorded. Professor Johnson seems to have done his work conscientiously and carefully, and for this he deserves credit.

The book is divided into four parts. Part I. is a synopsis of the principles underlying the laws of the strength of materials. It treats of the general nature of deformation and stress, of the different kinds of strains to which materials are subjected, and of the resilience of materials. Part II. relates to the manufacture and general properties of materials, taking in succession cast iron, wrought iron, steel, other metals, cement, brick and timber. Part III. describes testing machines and methods of testing. Part IV. treats of the mechanical properties of materials as revealed by actual tests.

If any part of the book could be reduced, Part II. might have been cut down. It is a question whether descriptions of manufacturing processes and illustrations of furnaces and the like do not unduly increase the size of the book without giving a corresponding advantage. It is well for the constructing engineer to have a general idea of methods of manufacture, but for their full details he must go to other sources. To give complete descriptions of manufacture would expand the book into an encyclopedia, and it seems to us that a simple reference to the necessary authorities would have been sufficient.

The chapters relating to the strength and other qualities of timber are very full. This is an excellent point, considering the extent to which timber is used in American construction, and the difficulty which has heretofore existed in obtaining reliable information as to its strength. Here Professor Johnson has wisely taken full advantage of the admirable

series of tests of timber conducted by the Forestry Division of the United States Department of Agriculture. This is really the first comprehensive and systematic study of the properties of American timber, and its value is hardly yet appreciated by engineers.

Some space is also given to the recent developments in the microscopic study and investigation of the structure of building stones and metals. This method of study has been of comparatively recent growth and has given results of value, though there are still many who doubt its usefulness.

There are many excellent points in Professor Johnson's book, and we do not doubt that it will be appreciated by engineers. His frequent use of stress-diagrams and graphic methods of presenting facts will, we think, be approved by a great majority. The use of a diagram instead of a table, or with a table, will often make clear at once the facts and relations which the reader could pick out only with considerable expenditure of time and labor from the mass of figures constituting a table.

It is to be regretted that the author has felt it necessary to use the old clumsy English units of weight and measure throughout. So large a part of the tests and investigations upon which our knowledge of materials is based has been the work of engineers who use the metric notation entirely that the conversion into English measures must have involved much labor. He has as an excuse the unwise conservatism of many who have clung to the old measures. It is a pity that our engineers have not of their own motion adopted the metric units—as the chemists did long ago—and thereby brought themselves into line with their brethren in other countries. We do not blame Professor Johnson in this case so much as we do the engineers, especially the mechanical engineers; many of whom, we know, would prefer the metric standards, but have hesitated over their adoption out of deference to a few men.

This can readily be changed, however, when we adopt the metric system, as we will certainly do before long. Meantime the book before us is a very acceptable and useful contribution to engineering literature.

## 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.

*Geological Survey of Canada: Report of the Section of Chemistry and Mineralogy.* By G. Christian Hoffmann, F. G. Wait and R. A. A. Johnston. Ottawa, Canada: H. M. Printer, 1897. Pages, 59. Price, 10c.

*The Railway Builder. A Handbook for Estimating the Cost of American Railway Construction and Equipment.* By William Jasper Nicolls. Philadelphia, Pa., and London, England: J. B. Lippincott Company. 1897. Pages, 233; illustrated. Price, \$2.

## 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 Grand Central Mine, Mexico, and the Exploration Company.

Sir: Upon my return to London, after nearly three months' absence, Mr. Henry Janin has asked me to rectify a mistake in an allusion to his name in a letter from the Exploration Company, referring to the Grand Central Mine, written on March 1st and published in your issue of March 2d. The question of the Exploration Company's participation in the purchase of this mine was left solely to me, as the mining adviser of the company, and was determined upon by me, not by any advice or recommendation coming from Mr. Janin, but upon my own judgment, after an examination of plans and data collected by Mr. Janin and Mr. Farish, supplemented by favorable telegrams from the mine giving information as to developments made after the experts had left Mexico. The data before me I believe to have been full and accurate. For any error in judgment the responsibility rests entirely with me. Mr. Janin's report, which was written after the purchase had been made, was very cautious and conservative, and, while stating the good features of the property, fully dwells upon the adverse facts and circumstances. My co-directors, who sent the letter of March 1st during my absence, were not fully acquainted with the transaction, and Mr. Janin having also been absent from England for two months, leaving just before March 1st, this correction has been unavoidably delayed.

HAMILTON SMITH.

Office of the Exploration Company, Limited,  
11 CORNHILL, LONDON, E. C., May 10th, 1897.

[This letter was published also in the London *Financial News* of May 13th. It refers to the subject of an editorial in the *Engineering and Mining Journal* of March 20th last.—Ed. E. & M. J.]

The Southern States Exploring and Finance Syndicate.

Sir: I beg to submit for publication some corrections to an article published in the *Engineering and Mining Journal* on May 15th, written by Mr. W. M. Brewer, on "The Villa Rica Mining District, Georgia." After telling how, when and where the Southern States Exploring and Finance Syndicate, Limited, bought their property, and how much had been expended, he says: 1. "The consequence is that the prospect shows no ore in sight." Our answer is, by careful measurement our prospect shows 1,000 tons of ore in sight, value by fire assay \$7 per ton.

To quote again: 2. "To-day the company has to represent the expenditure stated, a second-hand stamp mill, an old pattern rock crusher, a shaft 50 ft. deep, in which no ore is exposed. Another shaft sunk to a depth of 40 ft. connected with the old workings, which were carried down to a depth of 120 ft., the ore extracted as work progressed downward, and at the bottom is exposed a body of quartz averaging about 3 ft. in thickness at the floor." We reply: We have besides the old mill and old crusher Mr. Brewer mentions, a first-rate 35-H.P. engine, a 60-H.P. boiler, a Blake pattern pump, tanks with storage capacity of 24,000 gals.

of water, hoisting plant capable of hoisting 30 tons of ore a day, and up to the present time we have milled over 1,000 tons of ore. Our main prospecting shaft is 120 ft. deep vertically, sunk entirely by us, and the drift at this level is into the ore body 100 ft., developing an average thickness at the floor of 7½ ft., the measurement from the apex of the vein to the floor being 15 ft., from which 1,000 tons of ore has been extracted, value by fire assay \$7 per ton.

3. Mr. Brewer says: "Near the surface it was no rare thing to find specimens of quartz in which the particles of gold were visible to the naked eye. This gold is apparently not disseminated through the quartz, which is banded and fractures with regular lines of cleavage, but is found in particles along the cleavage planes." We reply: Gold particles can be readily seen in the quartz mined from the drift at 120 ft., and it is most decidedly disseminated through the ore, while it is also found along the cleavage planes.

With regard to Mr. Brewer's reference to Mr. P. F. McManus, I would like to add that Mr. McManus is not a director of this company, and consequently has nothing to do with the management of the concern.

VILLA RICA, Ga., May 19, 1897. WALTER E. DOWLEN, Acting Manager.

#### The Adit Tunnel, Ward Camp, Colo.

Sir: The tunnel method of opening whole mining regions, is, in Colorado, rapidly assuming important proportions. Heretofore the method has been applied mainly to single mines, where machinery and pumping through shafts have either become inadequate or too expensive to operate. But recently, there is a marked tendency to give the system wider application, and tunnel projects are springing up in every mining section of the State. The idea of driving a single tunnel line in such a way and at such a depth as to drain and tap every vein in a large area, doing away with expensive pumping machinery and hoists, makes a strong appeal to the operator and investor. Another factor that has given the idea a great stimulus is the recent decision of the Supreme Court, giving to a tunnel corporation control of all unoccupied territory through which which its line is projected. The lower cost of explosives, and the improved drill machinery has made it possible to drive these great bores, whereas formerly this factor of cost alone made such undertakings impractical. In Cripple Creek, at the present time, there are fully a dozen of these extensive projects under way, and at Idaho Springs four or five others are pushing their way into the mountains. Regarding these projects, however, a word of timely warning may save some money and disappointment. The method, while undoubtedly good in itself, does not admit of universal application. Its method cannot be safely applied to a non-fissure country, or where irregular deposits or blanket veins exist; nor will it be entirely safe in tellurium bearing regions, owing to the possibility of tellurium ores changing at great depths to a worthless sulphide. But in a fissure region, where sulphide ores dominate, as they do in the gold belt whose central point is Gilpin, and whose northern limit is Ward, the tunnel system may be safely applied.

A proposition of this kind to open the entire Ward district, nearly in line with these remarks, is the Adit tunnel enterprise of that camp. Above the bed of upper Left Hand Creek the general elevation of the district is about 800 ft. The veins are true fissures, bearing iron and copper sulphides, and course east and west, nearly. All the known leads lie nearly parallel at a maximum distance of less than 3,000 ft. Up to the present time—though the district has a record of 30 years' production—no deep mining has been done, although the veins are believed to extend, with continually increasing values, to great depths.

The proposition is, first, from the lowest practical point on the Left-Hand line to drive on its own property, following the course of the California-Dew Drop lead westward for a distance of 6,000 ft.; second, to send out laterals north and south from the main line and reach all other veins in cross-section; thence, by a system of sub-laterals, to develop the mineral in each vein cut. The original, or main tunnel, would thus become the common artery of the entire district. Through this the entire ore product of the district may be made to pass and drainage may be supplied. At present over 1,200 ft. of the main line have been driven. The work is done with machine drills driven by air compression. A 24 in. gauge double-track of 20-lb. rails, beneath which runs a 2-ft. box waterway, is carried the whole length. The break is 9½ ft. in the clear, and 8½ ft. wide. The gradient is slight, 0.33%, and the loaded and empty cars pass and re-pass over this grade with the least possible resistance.

Though running on a known lead, no considerable ore has been reached until the last 200 ft. Mining therefore is now in progress, but the work is so arranged that the tunnel drive is in no way impeded. A mill equipment is already established at the mouth of the tunnel, with a present daily crushing capacity of 100 tons. An electric power transmission plant will be established for light power and ore haulage. For the perfection of the entire system—tunnel laterals, mills and electric plant—more than five years will be required and no less than \$1,000,000 capital.

WARD, COLO., May 1, 1897.

J. T. LOFTUS.

The Nobel Dynamite Trust.—The results obtained by this corporation in 1896, while not quite as good as expected, have been sufficient to warrant the payment of a dividend of 12% for the year. The capital is \$9,127,000, in \$50 shares. The net profits in 1896 amounted to \$1,101,560, and the sum paid as dividend was \$1,080,450. The report says that the business was good during the year, except in Germany. It is proposed now to establish factories in the United States.

Technical Education in Russia.—The Imperial Technical Society of St. Petersburg has appointed a committee under the presidency of Professor Schuljatschenko to report on higher technical education. It appears that in the Russian works (excluding Siberia and the Caucasus) 4.97% of the managers are technically educated Russian subjects, and 2.14% foreigners. On the other hand, 88.13% of the managers who have received no technical education are Russians and 4.76% foreigners. It follows that in Russia only 7% of the works are directed by managers who have received a scientific education.

#### THE INTERNATIONAL GEOLOGICAL CONGRESS.

Written for the Engineering and Mining Journal by our Special Correspondent.

The seventh International Geological Congress will be held at St. Petersburg from August 29th to September 4th, and preparations for it are going forward with the usual hospitality of the Russians. The sessions of the Congress will be devoted to the discussion of a series of questions which have been prepared and will be laid before it by a committee having the matter in charge. The chief question to be discussed, and in fact one of the main objects of the existence of the Congress, is the unification of geological nomenclature throughout the world. The effort is making to bring about the desired object by persuading the geologists of all nations to adopt a so-called "natural" system of classification based as much upon general physico-geographic changes common to the whole globe as upon faunal characteristics and not upon the accidental limits of the different formations. Uniformity will then come through applying the rule of priority of application of a name to a described geological formation and by avoiding the multiplication of new local names for strata already well known in other regions. Another vexing question to be considered by the Congress is the bringing some order out of the chaos of names which is burdening the comparatively new science of petrography and almost rendering a special glossary necessary with each new memoir on rocks. A committee under the chairmanship of Dr. A. Michel-Levy was appointed at the last Congress in Zurich to report to this Congress a plan for solving this question.

These are the main theoretical problems that will be discussed at the Congress, but matters of economic interest will not be omitted, and the grand excursions which are offered will furnish visiting geologists with much practical knowledge of the geology of Russia. The month preceding the sessions at St. Petersburg will be devoted to a trip to the Oural Mountains, visiting on the way several of the noted gold, copper, platinum and manganese mines of the central part of the range, the gem and mineral mines of Grand Tagana and Palkina, and the Imperial gem-cutting establishment at Ekaterinburg. Those especially interested in paleozoic geology will make an excursion in Esthonia instead of going to the Urals, while those devoted to archæan and other crystalline rocks will spend several days in Finland. After the meeting in St. Petersburg has closed there will be a grand excursion to the Caucasus Mountains and the Baku oil regions on the Caspian Sea. Departure from Moscow will be made in three groups: one by way of Kharkov and the Donetz River; another by way of Nijni-Novgorod and the Volga, and the third by way of Kiev and the Dnieper. These three parties will reunite at Vladikavkaz and go in company along the Georgian military road through the Caucasus Mountains to Tiflis and by rail to Baku. Returning thence the party will proceed to the Crimean Peninsula, and the excursions will close at Sebastopol on October 5th. Several side trips and alternative routes are offered, one of which visits Mount Elburz, the loftiest mountain in Europe; another ascends Mount Ararat, and another examines the Mamison glacier in the Caucasus. While at St. Petersburg a visit will be made to the cataract of Imatra in Eastern Finland.

The Congress is held under the patronage of the Emperor, who furnishes the geologists free transportation, first-class, on the Russian railroads during the continuance of the sessions and the excursions. The honorary president is the Grand-Duke Constantine, while the acting president is Dr. A. Karpinsky, the director of the geological survey of the empire, and the secretary is Dr. Th. Tschernyschew, of St. Petersburg.

By-Product Coke Ovens in England.—The Simon-Carves By-Product Coke Oven Company has just closed a contract to erect a block of coke ovens of the Simon-Carves type at the Wharnccliffe-Silkstone Colliery. The plant will be started on a large scale.

The Dumoulin Copper Depositing Process.—According to London Engineering this process has been worked out experimentally in Paris, and is about to be tried on an industrial scale. This process is protected in Great Britain by the following patents: 16,360 of 1895; 9,289 of 1896; 2,709 of 2,712 of 1897. It is the invention of a chemist working in M. Dumoulin's laboratory in Paris; and in small experimental works there it has yielded satisfactory results. The chief difficulty in manufacturing articles by electrolytic deposition, it is well known, is the tendency to irregular deposition, and the lack of homogeneity that this produces in the finished article. This difficulty is overcome in the Dumoulin process, by the use of greasy matters of animal or vegetable origin. Those specifically mentioned in the first patent are albumen, fibrine, muscle and intestine. The revolving mandril upon which the tube or other hollow article is being formed is continually traversed externally by bodies, called in the patent "impregnators," charged with these greasy matters. This is effected by means of a rod bearing a number of these "impregnators," to which a horizontal sliding movement is given. This rod is parallel to the mandril, but its movements are at right angles to, and independent of, those of the latter. Any portions of the deposit which are growing in thickness more rapidly than others, press into these impregnators, and, in consequence, become coated with a film of greasy matter squeezed out upon them by the pressure. This effectually stops, for the time being, further deposition of copper upon the portion of the article where it exists. When the filling up of the hollows has once again restored the surface of the article to equality, the greasy film is taken up or absorbed by the bodies already spoken of and deposition of copper occurs over the whole surface. The process is automatic, and as very slight pressure is required to squeeze out the greasy matter, lamination is claimed to be avoided. The body which carries this greasy matter, and which can so effectually reabsorb it, is the chief feature of this patent; and, curiously enough, nothing is said of its composition in the first patent named. The Rio Tinto Company, Messrs. Matheson & Company, of London, and Messrs. McKechnie, of Widnes, are said to be chiefly interested in development of this process.

## DREDGE-WORK IN THE SIBERIAN PLACERS.

By E. D. Levat.

In his report on the gold-fields of the Trans-Baikal, M. Levat says that the problem of working the second level of placers, where the subsoil is yielding and marshy, has been solved in several places by the use of the dredge. The accompanying illustration shows the plan in use by the Verkhne-Zeya Company. The type of machine chosen is a bucket dredge which had been tried on the company's property, but was not adapted to the local conditions. It had proved too powerful, too heavy and too difficult to move from place to place where it was needed.

In the Siberian placers it is necessary to have a machine which can be worked with a small force; but it is necessary also to move it frequently owing to the small depth of the gravel deposit which can be worked. At a few feet below the surface the ground is always frozen and must be worked in another way. In this case the problem was solved by mounting the excavator or dredge on a barge or pontoon, which was built on the spot from lumber cut close by. This barge was floated in an artificial basin which was filled with water by a stream which flows through the placer. The bedrock, on which and in its cavities nuggets are generally found, is worked over by hand as it is uncovered by the dredge.

In the engraving the lines *A C* show the outer limits of the excavation, the lines *B C* the limits of the water, the dotted lines *B D* are the limits

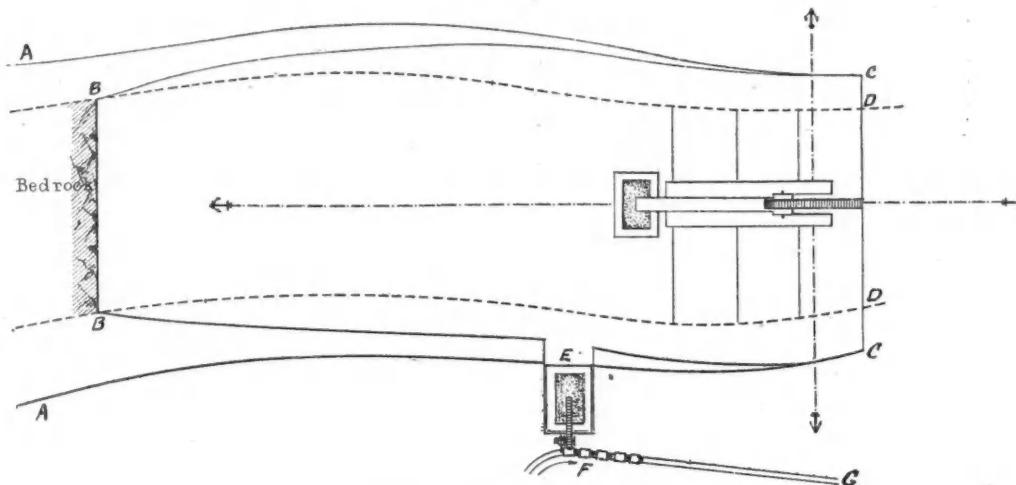
## THE TREATMENT OF ZINC-BOX PRECIPITATE.

A feature of the interesting plant of the Treasury mine in the Transvaal, as described by the *South African Mining Journal*, is the system and plant introduced by Mr. T. H. Leggett, the consulting engineer—who is well-known in this country—for the cleaning up and drying of the zinc-box precipitate from the cyanide process. The slime sediment from the zinc extractor boxes is placed in a wooden tank, into which the zinc shavings are likewise washed through a coarse screen. The KCy solution brought with the slimes and shavings from the precipitating-boxes is then pumped out by means of an india-rubber hose pipe attached to the pump suction, and is forced through the press, leaving the slimes in the bottom of the tank in the form of a thick mud. A bucketful of concentrated sulphuric acid is then poured upon the slimes and dissolves the zinc, a hood having been lowered on to the tank for the purpose of leading the fumes outside the building. On the acid being spent and the hood raised, one bucketful after another is poured in gradually until all the zinc is dissolved—at which stage the contents of the tank should be about neutral. Boiling water is now run on to the slimes in the tank by means of another rubber hose-pipe, until the tank is filled; meanwhile, the slimes are constantly agitated with a wooden stirrer. The pump draws off the hot slimy solution and forces it through the filter-press—the solution being kept stirred all the time, and more hot water being added as required until the tub is empty. More hot water is then pumped through the filter to further wash the slime-cakes and to remove

Fig.1.Elevation



Fig.2.Plan



DREDGE WORKING AT THE ZEYA PLACERS, SIBERIA.

of the channel in which the gold-bearing gravel is deposited. The gravel is shown at *H* in the vertical section.

The gravel brought up by the buckets is deposited in a sluice carried on the barge or dredge boat. The water for the sluice is furnished by a centrifugal pump. As it passes from the sluice back into the basin, the same water can be used over again, a great advantage where the supply is limited. The bottom of the sluice is provided with riffles. The tailings from the sluice are discharged into a wooden float or barge, a sort of floating caisson.

When this float is full it is towed or hauled to the side of the excavation at *E*, where a little basin or dock has been made to receive it. Here apparatus is provided for discharging the barge into small wagons *F* on a temporary track *G*. This extends to the dump, to which the wagons are hauled by horses on the temporary track. In practice this arrangement works very well. Two floats are always in use, one being in place by the dredge, while the other is discharging. The capacity of a float is about 39 cubic meters.

The chief defect in this apparatus is the shortness of the sluice, which prevents the complete washing of the gravel. The length ought to be increased, which could be done by making a sluice in the form of a *Z*, with one or two under-currents, which would certainly increase the yield. This question is too important to be disregarded. Aside from this the apparatus works well, and is a good specimen of the adaptation of material on hand to secure the object desired.

**Iron Manufacture in Japan.**—Advices from Japan report the formation of a syndicate of owners of iron mines, with a capital of 27,000,000 yen, to establish steel works on an extensive scale. They have asked the government to guarantee 6% on the capital for a term of years. The head of the syndicate is Mr. Amenomiya Keijiro, the owner of extensive iron mines at Iwate-Ken.

all acidity and zinc sulphate. Air may now be pumped through to dry the filtrates, after which the press is unscrewed and the slime-cakes removed. These are dried in a closed muffle and without stirring, so that no dust whatever is made. The dried slimes are then melted into bars in the usual way.

A bi-monthly clean-up at the Treasury mine furnishes the following data: Weight of dried slimes, 108 lbs. av. = 1,575 oz. troy; sulphuric acid used, 234 lbs. av.; flux used—borax, 5 parts, soda, 3 parts, precipitate, 10 parts; slag produced, 48 lbs. (31.1 lbs. per 1,000 oz. of precipitate); gold produced, 446.81 oz. fine; silver produced, 55 oz. fine. The bullion produced assayed 750.3 oz. fine gold, 92.9 oz. fine silver; or 843.2 oz. total. The solutions escaping from the filter-press assayed 8c. per ton in gold; 400 gals. of hot water were used as wash-water per 1,000 oz. of precipitate.

Owing chiefly to the amount of copper pyrites in the Rand ores, some 6½ lbs. less of slag per 1,000 oz. of precipitate were formed at the Treasury than at the Standard mine (where the system was first inaugurated), while the bullion is 100 points less fine. An important point in the economy of this method is the fact that the cakes from the filter press are merely dried without stirring, whereas in the method generally in vogue on these fields (roasting with nitre) causes a loss—due to stirring and the escape of fumes—which Rand metallurgists shudder even to talk about.

The only new feature in this method of treating cyanide slimes is the adaptation of the hot-water boiler (initiated by Mr. Leggett); the boiling water being supplied by freshly heated water from a boiler heated by a steam pipe; this detail has rendered successful a treatment that without this feature has given but indifferent results. By means of the hot water-washes, pumped through the slimes at a pressure of 60 to 80 lbs. to the square inch, all the disagreeable and loss-provoking (in the subsequent smelting) sulphate of zinc is thoroughly eliminated. The total losses by this method are under 0.1%, while much less, as well as far cleaner, slag is produced than by the nitre-method in general use, together with a higher grade of bullion.

## NATURE'S CONCENTRATORS.

Written for the Engineering and Mining Journal by Alfred C. Lane.

It has been shown that all the elements, even the precious metals, are widely disseminated in minute quantities, both in the eruptive rocks which bring them up from the depths of the earth, and in the sea water a little of which is buried in almost every sediment. The distribution of the elements is not, however, entirely even. That among the eruptive rocks the olivitic have more nickel and cobalt and iron, and that lithium and tin are associated with the more silicious eruptives, is well proven. Similarly, though perhaps less markedly, lead is associated with granitic rocks, but copper, gold and platinum with basic rocks. Such unevenness of distribution, however, does not account for the ore deposits which are actually developed. In them we find that other causes have produced a greater degree of isolation and concentration of particular elements, so that man finds it worth while to continue the work.

Inasmuch as the laws of nature are uniform and universal, we shall find that these other causes are but modifications of the very same agencies which we apply in the laboratory or mill to complete the separation which nature has begun. It is, indeed, the main object of this paper to trace the analogy between the natural and the artificial processes, and draw some practical conclusions therefrom. The economic reason for this analogy we can easily see in that whenever nature has partly done our work for us, it will be cheaper for us to continue the work, hence the law will be that among equally accessible deposits, mining will begin where nature has done the most sorting and purifying, and will gradually extend to the less concentrated deposits, in which less natural concentration is often partially compensated for by a greater volume of deposit. Thus the first California miners skimmed the cream of the placer deposits, where the yield was comparatively high per ton, and were succeeded by hydraulic mining in ore of much lower grade, even in gravels which yield but a fraction of a dollar's worth of gold per ton. So the Lake Superior copper mines began by confining their work to the large masses of copper, while stamp-rock was but little regarded. At the present day the leaders in wealth and dividends are mines whose large stamp mills crush rock containing less than 80 lbs. of copper to the ton—copper so finely divided that much of it slips through their fingers into Torch Lake. Very probably future generations may find a profit in re-washing the waste of this generation, just as we have re-worked the refuse of past ages.

The artificial separation of an element may be worked by chemical or mechanical means. Under the head of mechanical separations we have such processes as panning, jigging, washing and vanning, and also separation by means of suspension in a fluid so heavy that some of the constituents of a powder poured therein float, while others sink.

Now nature does a large business in the process of concentration by washing. She replaces the crushing work of the stamps by the slower, but no less effective process of rotting, or disintegration by frost. Then her streams handle over and over again the crumbled material, until sometimes, as in the platinum sands of Oregon, the waves of the sea join in the work. Moreover, there are two distinct ways in which the product may be delivered, corresponding to our two different methods of artificial jigging. If the size of the grains of sand is nearly uniform as when sizing precedes jigging, then the heavier grains will be dropped first by themselves and the lighter carried farther. Of this process I remember seeing a quaint illustration, years ago in Bulgaria, not far from Samakov. The streams flowing from an area of even-grained plutonic rock had partially concentrated the magnetite from it in some of the sand banks along their course. The peasants washed again the richer parts of these sand banks, and the iron ore thus twice washed, once by nature and once by man, was reduced to iron directly in the blacksmith's forge, and pounded into solid lumps under crude trip-hammers. Streaks of black magnetic sand are not uncommon on beaches and on Lake Superior have led to serious inquiry as to their value, but at present they will not pay. They await the often heralded, but still expected, practical magnetic separator.

A second case is where the size of the grains or fragments is very irregular. Then large particles of less specific weight settle down together with smaller particles of greater specific weight. Thus, for example, small particles of gold may settle with a coarser gravel of quartz and other material. Once in the gravel bed the smaller gold particles then tend to work down through the chinks between the coarser fragments toward the bottom of the gravel bed. This action corresponds to "jigging through a bed."

A rough stream bottom of slate or shale may act as a sieve for such unsized deposits, the smaller particles of gold settling or being caught in the rough nap of the slate outcrop, while the larger particles roll along over it.

Thus through mechanical actions corresponding to those of our stamp mills we have the placer type of deposits. There is no reason why these mechanical actions should be confined to present sands and gravels, and in fact we have many fossil placers, such as the South African deposits of the Rand are described to be. The gold deposits of Mysore appear to be of similar type. Shall we ever find similar deposits concentrated from the decay of the Archaean gold regions of Michigan and Minnesota? The ice age has probably stirred up all the products of the disintegration of latest period of erosion, but it is not inconceivable that the carboniferous conglomerates might somewhere be auriferous, or that there might be detritus washed from Minnesota goldfields in the Cretaceous.

The next means of separation to which we have referred, namely, the separation by settling in heavy solution, is a means to which nature has not so clearly resorted. Still A. Harker has suggested that in huge masses of molten matter the heavier and earlier crystallized minerals may have a tendency to settle under the action of gravity, and that thus the bodies of ore associated with some peridotites may have been formed. But this matter has already been treated quite fully in *The Mineral Industry*, Vol. IV., by Vogt, and all I need say is that the splitting up of eruptive magmas is a certain fact. I have, for example, found in some of the Keweenaw sheets of trap an accumulation of augite at the bottom. It is probable, however, that such separations occur before crystallization, and are chemical rather than mechanical. With regard to mag-

netite the theory seems to me applicable in one form or the other—part of the Nahant gabbro-diorite was in the early days of New England used for an iron ore—but as for the sulphide bodies such as those of Butte, Montana and Sudbury, Canada, while Vogt has applied this explanation to them, and I would not dismiss it with such scorn as does Posepny, yet it does not seem to me the only concentrating agent.

Passing now to chemical methods of separation, we give but a passing word to such relatively unimportant methods as sublimation, by which zinc is artificially formed and sulphur naturally formed, or to that mysterious principle which is probably only a modification of that segregative attraction which governs the formation of crystals generally—I mean the force by which flint nodules are formed—nodules of kidney iron ore, and nodules of zincblende, etc., such as are found in the Michigan coal measures.

But the great and typical process of separation in our laboratory is that of separation of precipitate and filtrate. By analogy we part natural processes into two divisions, according as they are like washing a precipitate, the ore being the less soluble part that is left, or are like the treatment of a filtrate, the ore being at first dissolved and leached out and then precipitated elsewhere by a new precipitating agent with which its solution comes in contact. To be sure, these two processes may be combined in the formation of any particular ore body, the valuable metal being first leached out and dissolved, then precipitated in some less soluble form and finally again washed and the impurities removed by a still different water. But this only completes the analogy with the operations of the laboratory, where the filtrate of the first stage has its constituents precipitated at a later stage, to be washed in a still later stage.

Take for example the Mesabi Range. According to H. V. Winchell, downward percolating waters have carried off the other constituents of the original taconite, leaving the hematite and limonite ore bodies as residues. But if we go back to the unaltered taconite, we find an abnormally high per centage of iron, not indeed enough to be worth mining, but enough to indicate some previous process of concentration. Spurr thinks it was an organic precipitate as glauconite. Van Hise thinks there was once an iron carbonate present in similar conditions. We may go a step farther back, inquiring whence came the iron in either case, and find that originally it was derived from the ferruginous basic rocks of the associated greenstone schists (which in so many cases have been the footwall of an ore body), and has been dissolved from them, to meet in the quartzites conditions of precipitation.

While the process of leaching away all that is not valuable of a rock (as a precipitate is washed on filter paper) may produce valuable deposits working alone—for thus kaolin comes from granite and laterite ores from basalt—yet it is of peculiar value in giving the extra richness and free milling character to the upper levels of many mines, removing deleterious impurities. The phosphorus seems to have been thus removed from many bodies of iron ore.

Generally speaking, this process of washing is due to waters working downward, for ascending waters are more likely to be already charged with mineral matter and are more likely to deposit than to dissolve, since they must have a chance when lower down, to dissolve matter under the more favorable conditions of greater heat and pressure. Waters descending from the surface have their solvent action aided by dissolved CO<sub>2</sub> from the atmosphere, and farther increased by various acids from the soil, and the increasing heat and pressure they meet. Now the question to what depth these descending currents can go is an important question in Michigan if, as according to Van Hise and Winchell, the final accumulation of the richer bodies of iron ore is dependent upon such descending currents; and I may remark that the decomposition of the copper-bearing rocks also appears to be of similar type. There is no definite limit to the depth, for surface waters may follow strata far beneath the general water level, following a synclinal undulation of the strata, if only the ultimate source of escape is lower than the region of intake.

If we turn now to the other process of formation of ore bodies, and suppose the ore to be carried away in a solution corresponding to the filtrate, the ore existing in minute quantities in a large mass may be all precipitated in one place and thus form an ore body. To illustrate by a simple case the Marshall sandstone of Michigan contains a small amount of iron which makes the weathered outcrop, and makes the sands derived from it often very brown. But near burnt-off marshes the surrounding sands are often bleached white, and the iron ore collected as bog iron ore at the center. We have, therefore, in studying such an ore body, and I believe this to be by far the most important class, to consider not merely the course of the solution, and the source whence it absorbed its precious burden, but also the precipitating agent, which is of equal importance in determining the actual shape and occurrence of the ore body. The precipitating agents are those of our laboratories, namely:

1. The mixture of solutions. Our chemical experience teaches us that the precipitated ore may or may not contain a constituent derived from each solution. We also learn that the relative amounts or proportions of the two solutions may vary greatly. It is easy to believe that solutions in different rocks will differ in chemical character, and thus results the frequent occurrence of ore bodies along the contact line of different rocks, and especially rocks such as porphyry and limestone, widely different in their chemical character, in the reaction of solutions derived from each. In our Michigan ore deposits the occurrence of many ore bodies of iron between a chemically dissimilar "diorite" foot and quartzite hanging is a very common one, and suggests at least partial co-operation of this mode of precipitation in their formation.

2. Passage of a solution over a solid precipitant. This leads to replacement deposits just as in old copper mines abandoned picks and shovels have been found changed to copper. We see this mode of accumulation of ore in various limestone replacement deposits, examples of which are too numerous to mention. The habit of allowing the water from Montana copper mines to run over old iron scrap which is gradually changed to copper, is an artificial application of this process which might elsewhere be imitated to advantage. In almost all cases where the ore appears as pseudomorphs, having the form of some other substance, this has been the process of precipitation. This is the crucial test by which we know that, strange as it may seem, in the Michigan iron ores SiO<sub>2</sub> has in many cases been the precipitating agent.



3. Change of temperature. Ordinarily cooling off is a well-known precipitant, which is particularly liable to act on ascending waters or waters escaping from an igneous intrusion.

4. Change in (ordinarily relief from) pressure may also aid precipitation. This cause will also be at work in ascending waters.

5. Escape of gas (of which evaporation is merely a modification, is another of our laboratory precipitants, most evident in nature as forming gypsum, salt and borax deposits.

6. Finally for the sake of completeness we may mention electrolytic decomposition, but I cannot lay any great stress upon earth electric currents in the formation of ore bodies, though such currents are known to exist. They must, indeed, of necessity exist where chemical action is going on. The northward shoot of the copper in the Calumet & Helma mine has been ascribed to the determining effect of electrolytic action, in some way controlled and oriented by the North pole. But it must be remembered that no one knows where the magnetic North pole was, or for that matter where the North pole of rotation was, when the copper was formed. The copper may have been formed in very remote times and certainly was formed before the last glacial period, for native copper occurs among the ice transported boulders.

We see from our enumeration that, while the other causes of precipitation are not forbidden to co-operate, a number of causes of precipitation will be especially active in the case of ascending waters. We may, therefore, expect that deep fissures in the earth's crust, suitable channels for such waters, will be lined with the results of the precipitation, becoming true fissure veins. Thus we see that our consideration of the formation of ore deposits will point to the great but not exclusive influence of upward ascending water. These streams upward ascending may draw into their current water seeping in from the side laden with matter leached in its course, which matter may be at once dropped on coming in contact with water of another character, or may be carried on up the fissure to be deposited in the comby coatings along the walls, as the cooling and release of pressure gradually induces precipitation. Indeed, we can see, on comparing the weight of a fissure filled with ascending warm water with that of an equal column of cold water, that the difference in specific gravities (say 1% for 80°) would tend to produce such an effect. Smyth, of Harvard, has recently argued for the efficacy of ascending waters in the formation of the Keweenaw copper deposits, basing his argument mainly on the fluoriferous and boriferous zeolites as indicating the activity of thermal springs. But the occurrence of native copper is so associated with the traps, occurring with similar traps far removed in time and space, as for instance with the traps of triassic time along the Atlantic seaboard, that one can hardly doubt but that the trap has contributed the copper, which may possibly have been leached out and drawn into the current of such thermal springs, though native metals generally occur in the upper zone of leaching and of the activity of descending waters. It will be remembered that the analyses of the country rock of the Comstock lode would favor some such explanation also for that lode. It is clear that in our copper mines the copper occurs in the damper and more porous bands of rock, amygdaloids and conglomerates, and is generally associated with a certain amount of decomposition in the country rock, so that Pumpelly's idea that the copper is concentrated from the Keweenaw formation seems still probable, even though we admit the co-operation of hot ascending waters in promoting the prerequisite decomposition and solution.

Without going too much into detailed illustrations which will occur to every one, probably from his own district, we will close by a review of certain rules for following ore deposits, which are well known, and follow obviously from consideration of an ore body as a precipitate.

Ore deposits will tend to occur: (1) In the line of water currents, either (a) in fissure and cavities, (b) in porous rocks, or (c) in soluble rocks. (2) near the contact of chemically dissimilar rocks, (3) where rocks containing the desired element in small quantities are widespread. (4) The more complicated and eventful the geological history of the region, especially if that history includes faulting, periods of eruptive activity, and subsequent weathering and erosion, the greater is the chance of the concentration of ore bodies.

**Aluminum for Miners' Lamps.**—Aluminum is now used in making miners' lamps. It is claimed that they are much lighter and neater than the ordinary tin and brass lamps, and that they can be cast in one piece, avoiding the leakage of oil from soldered joints.

**Electrolytic Manufacture of Gold Leaf.**—According to *l'Electrochimie*, in the Swan process a very thin, polished sheet of copper is immersed in an appropriate gold solution and the electric current passed long enough to give a continuous coating. The plated copper is then taken out, washed and immersed in a solution of ferric chloride, by which the copper is dissolved and leaves the gold intact in the form of a leaf not over 0.0001 millimetre in thickness. It is impossible to measure such a thickness, and it is ascertained approximately by weight.

**The Education of the Mining Engineer.**—At a meeting of the members of the Midland Institute of Mining Engineers, held at Leeds, Mr. G. B. Walker, who presided, read a paper on "The Education of Mining Engineers." Reference was made to the complete character of the mining education given in the Westphalian mining school, and the president made a suggestion to the effect that a school should be founded, called the Barnsley Mining and Science School, at which mining engineering, technology applicable to the industries of the district, and elementary science might be taught. There should be a resident teacher of science and competent teachers of engineering, mechanical drawing, building construction, etc. A discussion followed, in which Professor Goodman expressed an opinion that good was not to be done so much by giving elementary knowledge to a large number as by giving the highest education to a few; and Professor Beddington urged the desirability of the time spent in a college course being allowed to count for the manager's certificate. The latter point will be brought before the Federated Institutes shortly.

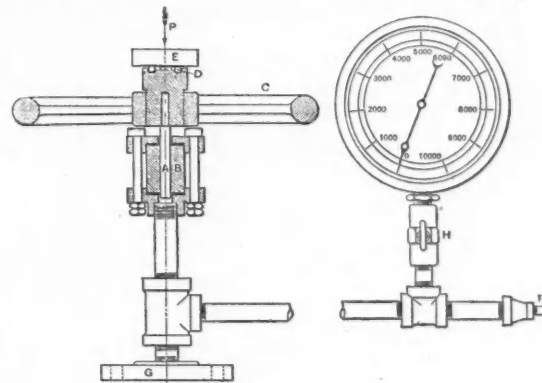
#### APPARATUS FOR MEASURING VERY HIGH PRESSURES.

By D. S. Jacobus.

In a paper read before the American Society of Mechanical Engineers, Mr. Jacobus describes this apparatus, which is shown in the accompanying illustration. The pressure-measuring device consists of a steel plug *A*, 0.5 in. in diameter, fitted into a steel bushing *B*, the hole in which is 0.5005 in. diameter. The top of the plug *A* is fastened to the center of the wheel *C*; *E* is a steel plate which bears downward on the axis of the wheel *C*. There is a ball-bearing *D* between the steel plate and the axis of the wheel. *G* is a circular base for supporting the apparatus. A pressure is produced by means of a special device, not shown in the sketch. This pressure is transmitted to the measuring device by forcing oil through the 1/4-in. pipe *F*. The oil pressure tends to raise the plug *A*.

The plug-and-wheel device is placed on a pair of platform scales, or in a testing machine arranged for tests of compressive strength, and the downward force *P* required to hold the block *E* in place is accurately measured. To this is added the weight of the wheel *C*, and of the ball-bearing device and plug, and from this total force the liquid pressure is calculated. The wheel *C* is spun around when the weight *P* is measured, in order to rotate the plug and thus eliminate the effect of friction. The pipe *F*, which transmits the pressure, is about 16 ft. long, and bent in the form of a *U*, so that any little displacement of the pressure-producing device will not affect the reading of the platform scales.

If a gauge is to be tested it is attached at *H*. The weight *P* required for a given pressure is calculated and the scale-beam of the platform scales is adjusted so that it will register this weight. The oil pressure is then increased until the beam of the platform scales is raised, the wheel *C* being spun to eliminate the effect of friction, and when the scale beam is balanced the gauge is read. The reading of the gauge for various



GAUGE FOR VERY HIGH PRESSURES.

pressures is thus obtained, and the difference between the readings and the pressures, as measured by the plug, gives the corrections for the gauge.

This apparatus has been employed for calibrating gauges to 10,000 lbs. pressure and for measuring pressures as high as 15,000 lbs. per sq. in., and has given entire satisfaction.

#### THE "COPPER PLACERS" OF BINGHAM, UTAH.

Written for the Engineering and Mining Journal by Our Special Correspondent.

In the alluvial soil of a section of the main channel of Bingham Canyon, in the West Mountain Mining District, Salt Lake County, Utah, exists a series of copper occurrences that are locally referred to as "Copper Placers." The word placer is, however, erroneously applied, as it implies a broken formation washed and deposited into the bed of the stream, and the deposits referred to were not so created. Instead they appear to be the result of copper in solution coming into contact with masses of carbon formed by decayed timber in the soil, which has precipitated the copper in a metallic form. The area affected is quite limited in extent, and exists on a portion of the Starlus and Amanda claims where the locations extend down into the bed of the creek.

Attention was first drawn to the peculiar properties of the water in the immediate locality by the late Dr. Hickman, who constructed some ordinary ground sluices and after filling them with scrap iron, turned the water of the creek through them. In from six to ten weeks time his iron would be converted into a mass of metallic copper, about 85% pure, and he experiment was repeated a number of times during the Doctor's life. Subsequently some placer miners driving from the superficial channel for the rim came upon a beautiful specimen of metallic copper, weighing about 50 lbs., lodged against the trunk of a tree imbedded in the alluvial that had been deposited within their own recollection, and which was not more than 4 ft. below the level of the wagon road. A little exploration revealed numerous additional specimens of various sizes, and close inspection demonstrated that the soil was impregnated with numerous small particles of copper. Some efforts were made to recover the copper thus discovered by wet concentration, but no notable financial success resulted. The soil was not uniformly affected, and there were no superficial signs to guide the prospector in his explorations. With the dissipation of the hope that the Copper Placers would prove valuable in themselves a new value was attached to them as they formed the basis of much speculation, mostly of an unscientific nature, as to their source and origin.

A short distance up the canyon, above the soil containing the metallic copper, is a small spring of clear water, originating near some ledge

matter that shows some traces of copper, and by many it was believed that this spring was the source from which the copper came that is deposited farther down the creek. Analysis proved, however, that the water contained less than 0.02% of copper, and attempts to precipitate copper from the waters of this spring only, using metallic iron as a base, resulted in failure. This effectually disposed of the belief that the copper come from this particular spring, but meantime the copper continued to form in the soil, and it was noted that ground that had been once worked over contained metallic copper that had been formed in the interim since it had first been handled; proving conclusively that the laboratory was still in operation but still leaving the question of the origin in doubt. A new theory was advanced, comprehending the existence of a strong copper ledge at some depth below the surface, and crossing the affected area, and the presence of copper affinities in the alluvia. Whether or not the theory had the foundation of probability, it appears plausible from some observations that have been made. The waters of Bingham creek are usually turbid from the numerous concentrating plants and placers in the canyon, but it has been perfectly translucent at several periods, and at such times some peculiar phenomena have been noted in the area containing the copper placers through which the creek flows. Down to a certain point above the deposits in question the water would be clear and colorless, but as the edge of what is believed to be the copper belt was reached, the water, while still translucent, would commence to assume a green tinge which became darker as it flowed on, until at its junction with another muddy stream it would be a deep indigo. It was then assumed that the peculiar deposits had their origin within this area that was so peculiarly defined when the creek was clear, and that nothing but the proximity of a strong copper vein could account for the continual precipitation of copper in the soil. It was noted, too, that in the workings of several prospects within the affected area a sulphate of copper would form on the sides and roofs of the levels where assays had failed to reveal a trace of copper in the gangue, and these facts, together with the phenomena of the copper-colored creek water, confirmed in many the belief that the undiscovered copper vein in the vicinity was responsible for the copper in the soil. The only extensive prospecting that has been done within the area mentioned is the work of the Bingham Copper Company on the Starlus and Amanda claims, and this work unfortunately has all been of a character that would neither prove nor disprove the existence of the copper ledge.

Another theory has been advanced and is maintained by a select few, to the effect that the copper placers are due to the fact that nearly all Bingham ores, of whatever specific character, contain a varying percentage of copper in some soluble form—perhaps as a hydrous oxide—and that this copper is lost by the wet concentration to which a considerable percentage of all Bingham ores are subjected. As the bed of the creek contains no metallic iron nor other copper affinity, this copper in solution gives no evidence of its presence until it reaches the alluvia which contains the copper placers. Here is plenty of carbon formed by the decaying tree trunks and roots, and the combination is said to be sufficient to explain the presence of metallic copper in the soil.

That the deposits have escaped scientific investigation is due to the fact that the knowledge of their existence is almost confined to the small community in which they are found. If intelligent investigation should result in fixing their origin in harmony with either of the last two theories referred to there is no question remaining as to the economic value that would attach to the discovery. Where so much is being accomplished in the crude laboratory of nature there should be inducement for man to apply his acquired knowledge.

#### THE TIPUANI GOLD-FIELDS OF BOLIVIA.

Written for the Engineering and Mining Journal by William G. Agle.

Few people in this country realize the extent and value of the gold fields of Peru and Bolivia. Worked in the Sixteenth Century—some of them at a much earlier date—there are mining regions there, prospected, partially developed and of known value, but little worked. The writer spent five years, from 1890 to 1896, in constant prospecting and exploration in these old, abandoned gold-fields and has visited and examined many of them; but of all these mines perhaps the Tipuani region is the richest and most available.

The Tipuani is a river perhaps 40 miles in length, of which the lower 10 are known to be rich in gold. Its width varies from say 120 ft. to 75 ft. according to its depth and at low water it can be forded in many places. According to our geographical knowledge, which is more or less inaccurate, it is in about 15° 30' south latitude and about 70° west longitude. It empties at Guanay into the Mapiri River which, after flowing 100 miles through a mountainous country, empties at the port of Reyes into the Beni River, which, after flowing through forests of valuable woods and rubber trees for 950 miles, unites with the Mamore and forms the Mad-ira branch of the Amazon.

Like all the great gold-fields of Peru and Bolivia, the Tipuani was first worked by the Incas, who according to history took from its bars a large quantity of gold which they considered a sacred metal, and with which they adorned the temples at Cuzco, their capital. At the close of the seventeenth century the Spanish entered it from the west and, with the Portuguese from the East, worked it until 1781, when the Indians rose in revolt, murdered the proprietors and practically put an end to the business that made them slaves. It was again entered about 1847 by a Señor Villamil, who, owing to the fact that he was sub-prefect of the province, was able to procure much Indian labor and worked until 1861 when his advanced years compelled him to retire.

Nobody now has any definite ownership in this field, although Villamil's heirs do claim a spot of it here and there, and it is not improbable that they have been paying the semi-annual dues thereon since his death—now over 24 years—which, according to the laws of Bolivia, would give them title thereto. If so, their claim is valid, and a company, after securing possession of the Tipuani, should recognize them; if not, it is null and void and should be ignored. This should not be undertaken by parties unaccustomed to the laws, language and customs of the people of Bolivia.

Any individual or association attempting to acquire title could do so with ease by placing these interests in proper hands.

Title once acquired, in order to prospect the territory caissons the shape of a triangle should be sunk in the river bed. These should be about 12 ft. on a side, double boarded and with one point up stream; they should be sunk to the bedrock, the gravel taken up and run through a rocker. They should be sunk at intervals of not over 600 ft. The gold taken from each should be kept separate and correct maps of the river should then be made on which should be located the exact spot of each caisson, the amount of gold taken from it, and its value would then be ascertained. To work to advantage a company should be formed with large capital. There are few engineering difficulties to be considered. There is no ice or snow as in northern placers; water alone is the element that need be considered and handled.

The plan of working may be simple. First a ditch should be constructed on the mountain side on each side of the river with a dam built of cribbing and filled with rock and moss at its head. Lumber could be brought from the Beni country on a railroad which would have to be built along the Mapiri. With this a flume could be laid in the river bed of sufficient size to carry the water of the Tipuani in time of freshets. In this flume undershot wheels could be placed and geared to China pumps with which any remaining seepage water could be lifted from the bedrock. Thus we could apply the methods employed in all river mining, which cannot be here discussed for lack of space.

An ocean going steamer of 13 ft. draft can ascend the Amazon and Madeira Rivers to San Antonia, Brazil, in high water, and one of 8 ft. draft in low water. That port is 2,000 miles from Pará. At San Antonia begins a series of rapids, seven in number, called the rapids of the Madeira; on the stretches between each of these it would be necessary to place a small steamer for towing purposes, and around each a short line of railroad should be built, the longest not over 1,800 ft. Small flat bottomed boats of say 12 tons burden could be loaded at San Antonia, towed between the rapids by the steamers and taken around them on cars or cribs such as are used on the inclined planes of the Morris Canal. The upper rapid, that of Esperanza, in Bolivia, is reached a distance of just 120 miles from San Antonia. Here the flats could be unloaded and their cargoes placed upon steamers of light draft, as there is uninterrupted navigation for this class of boats to the port of Reyes, or to within 100 miles of the mouth of the Tipuani River.

The banks of the 950 miles of navigable water of the Beni are covered with wood suitable for fluming and piling purposes, such as Pala Marie, Ve E'tuva, Wackapoo, red cedar, etc.; its waters abound in turtles and fish and its climate is healthy. At the town of Reyes, which is 25 miles from the river, begins a great pampa, which extends north for a distance of 450 miles and on the east with little interruption to the Argentine border. On this pampa thousands of cattle roam, and owing to the lack of proper markets were selling, when I visited the place in July, 1893, for 4 Bolivianos (\$2) per head. Its soil is suitable for raising all the products of the semi-tropical zone, rice, coffee, cane, corn, etc., and with the introduction of proper machinery could be utilized by a company operating the Tipuani for producing almost everything consumed in the way of provisions.

When I visited Tipuani in August, 1893, I found there only nine men of foreign birth. Of these, the two McKenzie Bros. were at Ancota, perhaps one-half mile above the old town of Tipuani, and on the opposite side of the river. They had a hydraulic claim which contained a pay streak of gravel 3 ft. in thickness that gave the extraordinary returns of \$40 per cubic yard; but on the top of the pay streak lay a bank of sediment 36 ft. in depth which brought the average down to \$3 per cubic yard. They had at that time cleaned up their flume the second time for the season, and each time with the same result, about 25 lbs. of gold. None of the other foreigners were succeeding with their work from different causes, chiefly inexperience and that lack of unity which seems to characterize all the foreign residents in South American countries. Two Germans, Fryerheysen, a Freiburg graduate, and Wezman, who had been sent out by a German syndicate, lacked practical experience. Messrs. Simpson and Skeffington, both experienced miners, were without capital, and had been disappointed by their backer, a German merchant of La Paz.

Of Indians there were a few, with some negroes, descendants of some slaves whom the Portuguese brought to the river 200 years before. They were working in the most primitive way: the men worked in the tunnels and their wives brought the dirt out in their bateas, or wooden gold pans and washed it in the same, or else they went into the river at different riffles and, after turning over a large boulder, would kneel as low as possible in the water, scrape the sediment which had collected beneath the boulder into their pans or bateas, bring it ashore and wash it. They all had their sardine cans, which contained their gold, lying on the banks, and took no notice, not even of a stranger, when he picked them up and examined their contents.

Since then I have learned upon the authority of his son, that Señor Villamil in four of the years that he worked the bedrock bars of the river with his brigade of Indians took therefrom \$140,000 in gold. According to Clement R. Markham, when Villamil went to England and was shown the pump employed in the Cornwall mines, he exclaimed in delight: "With 20 years more to live and that machinery in Tipuani, I could buy France of Napoleon III."

The writer has explored the country from the Pacific to the headwaters of the Amazon, and thence to the Atlantic and has learned to appreciate its vast resources. He must confess to a feeling of astonishment at the indifference and ignorance universal in this country with regard to the great resources of our neighboring continent.

Gold in France.—Explorations which have been in progress for more than a year in the vicinity of Figeac, France, have, according to the *Echo des Mines*, resulted in the discovery of gold in decomposed diorite, in micaceous schist, and by veins of argentiferous galena, extending for a length of at least 8 miles. The explorations have been made under the direction of Mr. Alfred Evraud, formerly managing director of the Chatillon-Commentry Steel Works.

## THE BOLTHOFF-WETHEY IMPROVED ROASTING FURNACE.

The accompanying engravings show very clearly the construction of the Holtzoff-Wethey desulphurizing and chloridizing furnace. This furnace is a modification of the Wethey multiple deck calcining furnace which has proved very successful and economical in operation in the calcining of sulphide ores. The new arrangement of this furnace, herewith shown, adapts it to a class of ores for which the multiple deck furnace is not suitable—the desulphurizing of ores for chlorination and cyanide mills where a dead roast is desirable. In this furnace the roasting hearth is 12 ft. wide and 100 ft. long. The arch is held firmly between two heavy I-beams suspended from above from beams resting on channel iron posts. The general construction is such that the expansion and contraction of both the brick work and iron work is provided for. The furnace being of rectangular form and supported by the same means on both sides is less liable to injury from this expansion and contraction than other types of furnaces in which the arch is supported on one side by iron work and on the other by brick work, as the expansion in the two materials being unequal must necessarily be injurious to the structure sooner or later. The design of this furnace is also such that no iron work whatever is exposed to the fire except the rabblers. The rabblers are constructed of heavy pipe to which steel plows are clamped, and they are supported at both ends by carriages and are driven by wire rope and sprocket wheels. The carriage is so constructed that the rabble pipe and plows can be lifted out and replaced without disturbing the connection between the carriage and rope. Half of the plows on each rabble are set at one angle and half at an opposite angle, thus overcoming all end thrust. The fireboxes shown in this print are arranged for burning slack coal, but of course these can be modified to suit any fuel most convenient and economical to use.

One of the principal new features in this furnace is the addition of a cooling hearth for cooling the ore and delivering it to a conveyor

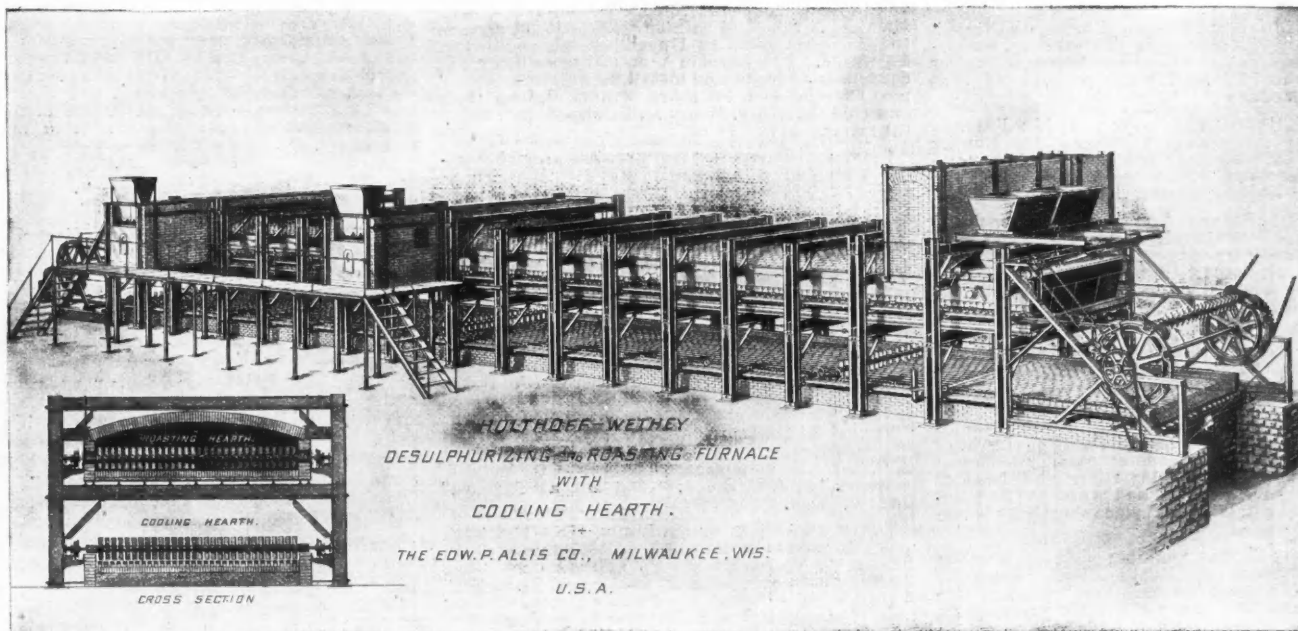
the fumes than where the iron work is enclosed or passes through the brick work.

The space required for this furnace for a given capacity is claimed to be much less than for any other type of furnace now on the market, and when the space ordinarily required for cooling floor is taken into consideration it is obvious that a great deal can be saved in the installation of a plant. The cost of a complete furnace per square foot of hearth surface is also, it is believed, much less than for any other type of furnace. The iron work being made self-supporting, there is much less brick work required. A 100 ft. × 12-ft. furnace, as shown in the accompanying print, will require 60,000 common brick and about 5,000 firebrick. The furnace is made by the Edward P. Allis Company, of Milwaukee, Wis.

## QUALITATIVE SEPARATION OF ARSENIC, ANTIMONY AND TIN.

By S. G. Rawson.

The method suggested by Dr. Rawson in a recent paper before the Society of Chemical Industry, Yorkshire Section, as reported by the *London Chemical News*, is as follows: The sulphides of the metals are washed upon the filter paper, and the whole or part of the residue is placed in a test-tube and boiled with 2 or 3 c. c. of concentrated hydrochloric acid, to which a drop or two of nitric acid is added, and again boiled. A yellow residue after the treatment with hydrochloric acid gives a preliminary clue as to the presence of arsenic, this sulphide being slightly, if at all, attacked by the acid. A saturated solution of oxalic acid is added in quantity sufficient to fill two-thirds of the test-tube; the whole is boiled, and crystals of oxalic acid are added until a hot concentrated solution of oxalic acid is obtained. A stream of sulphuretted hydrogen is passed, the whole of the arsenic and antimony being precipitated as sulphides, which are filtered off, the tin remaining in solution. To the filtrate



BOLTHOFF-WETHEY FURNACE.

whence it may be transported to any part of the mill by machinery. The advantages of having the roasted ore delivered from furnace at a temperature that will permit of its being handled by machinery will be appreciated by all metallurgists. It not only saves the cost of manual labor required to transport the ore from the furnace to the cooling floor and from the cooling floor to the point where it is to be treated, but it obviates the necessity of a large cooling floor and its accompanying building.

The ore is charged into the furnace at the driving end, and after traveling the full length of the roasting hearth is dropped to the cooling hearth and carried back to the charging end, thus allowing the ore the same length of time to cool that was required to roast it. In order to facilitate the cooling of the ore and insure its temperature being sufficiently low to prevent injury to the conveyors and elevators, water pipes are laid the full length of this hearth flush with the top; the amount of water necessary to affect the desired cooling of the ore can be regulated by the discharge from these pipes. The pipes are laid loose in grooves between the brick in such a manner that they can expand and contract without injury to the hearth or themselves.

One of the features important in a furnace roasting ore to a dead roast is not shown in this print, a valve shutting off the stream of ore from the feeder while the rabble is passing under it. Where the rabble passes through a stream of ore falling into the furnace a certain amount of ore lodges on the rabblers and is carried through the furnace and discharged in a raw state. This amount may not be great for each, but where a rabble passes through this stream once every minute or minute and a half, it amounts in all to enough to increase the sulphur contents to quite an appreciable extent. Those who have had experience with mechanical roasters in roasting to a dead roast will appreciate this feature. The fact that all the iron work of this furnace is exposed to the atmosphere renders it less liable to injury from the corroding action of

ammonia is added until distinctly alkaline. If a precipitate should then appear, which will not be the case unless a large amount of tin be present, add ammonium sulphide drop by drop until the precipitate redissolves; this it will do very readily. Acidulate with acetic acid; a heavy white precipitate, turning brown, indicates tin as a mixture of oxide and sulphide. It may be here noted that the treatment of ordinary ammonium sulphide with acetic acid produces a precipitate of sulphur, but the appearance of the precipitates formed in the two cases is quite distinct and cannot be mistaken.

Turning again to the residual sulphides of arsenic and antimony, these may be treated either with ammonium carbonate in the well-known way, or, and preferably, as follows: Dissolve in hydrochloric acid with two or three drops of nitric acid, boil, and place the solution in a Marsh apparatus. The evolved hydrides are then passed through a solution of silver nitrate, and the antimonide of silver formed filtered off. To the filtrate add a few drops of silver nitrate, and then very cautiously ammonium hydrate until the yellow precipitate of silver arsenite appears. The silver antimonide precipitate is washed, boiled with tartaric acid and filtered, a little hydrochloric acid is added, and sulphuretted hydrogen passed through the filtrate, orange-red antimony sulphide being thrown down. To both of these precipitates the ordinary reduction and sublimation tests can be applied. The above method gives thoroughly good results, and with amounts of the respective sulphides varying within wide limits, and does not require that tinkering with bits of platinum foil and of zinc, which is both unreliable and unpleasant.

Coal in Germany.—The production of coal in the Dortmund District in Germany for the first quarter of the present year was 11,750,315 metric tons, showing an increase of 724,970 tons, or 6.6%, over the first quarter of last year.

## PERSONAL.

MR. J. K. CLARK, the well-known Montana mining man, has returned from a two-months' trip through Mexico.

MR. P. C. COSGROVE, a graduate of the Butte School of Mines, will open an office in Butte, Mont., as a mining engineer.

MR. HENRY W. HARTMAN, vice president of the Elwood, Pa., Weldless Tubing Company, sailed this week for Birmingham, England.

MR. FRANK P. SWINDLER, mining engineer of the De Lamar, Nevada, mines, was in Utah last week, and visited Salt Lake City and Tintic.

MR. EBEN SMITH, manager of the Victor Gold Mining Company, of Cripple Creek, Colo., sailed for Europe on May 22d. He will be absent for about three months.

MR. MILTON L. HERSEY, consulting chemist of Montreal, Canada, has returned from a trip to New York, where he went on mining matters to the U. S. government assay office.

MR. H. A. COHEN, mining engineer for the De Lamar Mining Company, returned to Salt Lake City recently, after an absence of several weeks. He spent two days at Mercur, Utah.

MR. CARL ANDERSEN, mining and metallurgical engineer, recently of New Mexico, has established an office and laboratory at Denver, and will in future devote his time to mining in Colorado.

MR. CHARLES P. ROBBINS, superintendent of the Iron Mask mine, near Roseland, B. C., has tendered his resignation. Mr. Robbins intends to look after his claims in the Eureka District, Wash.

MR. E. A. MORLEY, for several years past traveling auditor of the Wisconsin Central lines, has resigned to accept the position of traveling auditor for the Anaconda Mining Company, located at Anaconda, Mont.

MR. F. W. BRADLEY, manager, and MR. FREDERICK BURBRIDGE, assistant manager of the Bunker Hill & Sullivan mine at Wardner, Idaho, have returned to the property, the former having been for some time in Nevada County, California.

MR. JAMES A. SMITH, who was recently appointed United States Consul at Leghorn, Italy, has been for a number of years superintendent of the Smith & Brainerd Marble Company's works at Belden, Vt. He has resigned that position and sails for Italy this week.

MR. CHARLES S. HERZIG, mining engineer, formerly with the Anaconda Mining Company and lately of the Boston & Montana Company of Montana, leaves on May 31st for Ecuador, S. A., to take a position as engineer with the Playa de Oro Mining Company.

MR. BERNARD MACDONALD, mining engineer, of Butte, Mont., recently made an extended tour of inspection through the Rainy River and Lake of the Woods mining districts, and is now at Rat Portage, Ont. He will leave this place shortly for Butte by way of Montreal.

MR. THOMAS RICKARD, mining engineer, who has spent some time in the South African Republic, recently left England to examine certain properties in Rat Portage, Ont., for a syndicate. He will go to that Province via Halifax and will return to England via New York.

MR. O. C. HART, who for the past two years has been employed as chemist and mining engineer at Gilt Edge, Mont., has made arrangements to open up an assay office at Fort Steele in connection with MR. L. N. POLAND. Mr. Hart will devote his time to mining engineering, and Mr. Poland will have charge of the assay work.

DR. J. E. TALMAGE, president of the University of Utah, at Salt Lake City, will leave in June for Russia to attend the International Geological Congress. The mineralogy of the country will be studied in company with a party of European scientists. The party will be under the protection of the Russian government, and will continue their search throughout the summer and autumn.

MR. THOMAS BROWN, JR., has been appointed assayer and chemist to Messrs. George P. Good & Company, mining engineers and metallurgists of Atlanta, Ga. Mr. Brown secured this connection through the "Positions Vacant" column of the *Engineering and Mining Journal*. This column has been the means of procuring excellent engagements for many hundreds of engineers, metallurgists, chemists, etc., in all parts of the world, and it is now recognized by prominent mining men everywhere as the best means to secure the proper assistants.

## OBITUARY.

EDWARD HAHN, an inside foreman at the No. 4 colliery of the Delaware & Hudson Coal Company, and for a score of years a prominent resident of Plymouth Township, Pa., died May 15th, aged 65 years.

JOHN HICKEY died at Cohoes, N. Y., on May 15th. He was for many years engaged in contracting, mostly in connection with the great iron-ore mines of Witherbee, Sherman & Company, in Essex County.

## SOCIETIES AND TECHNICAL SCHOOLS.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—The regular monthly meeting of the Engineers' Society of Western Pennsylvania was held in Pittsburgh, on May 18th. The paper "High Frequency Currents and X-Rays," was by Mr. H. W. Fisher and was copiously illustrated by electrical experiments. A great number of phenomena of high frequency currents were shown and a very powerful X-ray apparatus was operated, by which the beating of the heart, etc., could be seen.

MONTANA SOCIETY OF ENGINEERS.—A special meeting was held May 15th, at which a paper upon "Mineral Surveys," from Mr. Charles Tappan, of Salt Lake City, Utah, was read. The paper gave a method of taking direct solar observations, and suggested methods of meeting some of the difficulties and absurdities arising through the present mining laws and department rulings. The new list of members just published shows 89 active members, an increase of 50% since January 1st. The regular monthly meeting of the society will be held June 12th, at which Prof. L. S. Griswold will deliver an address upon "Geology."

COLUMBIA UNIVERSITY.—The programme for the usual summer classes is as follows for 1897: For the mining engineers and metallurgists the work in geology will be an examination of the great part of the Palaeozoic series of Central and Western New York, and a careful study of the pre-Cambrian and volcanic rocks of the Marquette region of Northern Michigan. Practical mining work will be done in the Angelina mine at Ishpeming, which will last 4½ weeks. The class in practical metallurgy will convene in Chicago, and metallurgical works at and near Chicago and Pittsburgh will be visited. It is expected that Prof. Henry M. Howe will personally take charge of this class.

IRON AND STEEL INSTITUTE.—The annual meeting was held in London on May 11th and 12th, at which the following papers were presented: "The Permeability of Steel-Making Crucibles," by Prof. J. O. Arnold and F. K. Knowles; "The Practice of the Combined Open-Hearth Process of Bertrand and Thiel," by E. Bertrand; "The Agricultural Value of Sulphate of Ammonia from Blast-Furnaces," by F. J. R. Carulla; "The Specific Heat of Iron," by Prof. W. N. Hartley; "Charging Open-Hearth Furnaces by Machinery," by Jeremiah Head; "The 'Weardale' Reheating Furnace," by H. W. Hollis; "The Effect of Phosphorus on Cold Shortness," by Baron Hanns Juptner von Jonstorff; "The Determination of Hardening and Carbide Carbon," by Baron Hanns Juptner von Jonstorff; "Malleable Cast Iron," by G. P. Royston; "Carbon Changes Connected with Malleable Cast Iron," by G. P. Royston; "Microscope Accessories for Metallographers," by J. E. Stead; "Central Blast Cupolas," by T. D. West.

ENGINEERS' CLUB OF ST. LOUIS, MO.—The 455th meeting was held May 19th at 1600 Lucas place. Mr. H. A. Wagner made an address upon "The Electric-Lighting System of the City of St. Louis." A review was given of the history of the lighting industry in the city and the present condition was described. Changes are now being made so that all lights can be operated from one kind of dynamo. Twelve hundred arc lamps are now being operated from one alternating current dynamo and the other arc lights are rapidly being changed to operate on alternating current circuits. The plan in operating arc lights is to use step-up transformers, and as many as 60 arc lights are operated in series on one alternating circuit. The same generator may be used for arc and incandescent lighting. Mr. Wagner gave a short sketch of the underground work now being installed. For commercial lights the plan is to use high-tension mains and distribute at low tension on the 220-volt, three-wire system, from transformers placed in the manholes.

ALABAMA INDUSTRIAL AND SCIENTIFIC SOCIETY.—The annual meeting was held May 18th at Birmingham. The following papers were read and discussed: "Copper Mining in Alabama," by Wm. M. Brewer; "The Manufacture of Machinery in Alabama," by C. J. Goehagan, of Birmingham; "Vitrified Brick," by C. J. Sibley, of Coal Dale. Dr. Eugene A. Smith, State Geologist of Alabama and Secretary of the Society, gave an interesting talk on "The Sulphur Deposits of Western Texas" and exhibited a number of photographs illustrating that section of the country. The committee which had charge of collecting the statistics of the mineral industry of the State reported that such monthly returns were sent in by from 90% to 95% of the producers, and the committee was thus enabled to furnish reliable statistics to the *Engineering and Mining Journal* and other technical papers. The report of the committee was accepted and the work ordered continued. It was resolved that a committee should be appointed to confer with the Governor, the State Geologist and a Commissioner of Agriculture with reference to making arrangements for a mineral exhibit at the Trans-Mississippi Valley Exposition to be

held at Omaha next year. Hon. Truman H. Aldrich and Wm. M. Brewer were appointed on said committee. The election of officers for the coming year resulted as follows: President, Hon. Truman H. Aldrich; vice-presidents, Messrs. Montgomery and Miner, all of Birmingham.

THE FEDERATED INSTITUTION OF MINING ENGINEERS.—The 24th general meeting will be held on June 3d, 4th and 5th, in London, under the presidency of Mr. Lindsay Wood, who will deliver his presidential address. The list of papers to be communicated to the meeting comprises the following: "The Dangers Attending the use of Steam Pipes," by A. L. Steavenson; "Electric Blasting," by William Maurice; "The Mineral Resources of the Colony of Queensland," by Wm. Fryar; "Occurrence of Iron Ores and Iron Manufacture in the Weald," by C. E. Hawkins; "A Cinnabar Mine in British Columbia," by W. Hamilton Merritt; "Automatic Milling," by Horace F. Brown; "Light Railways," by Leslie S. Robinson; "Mining in Rhodesia," by Mr. Albert H. Halder; "The South Wales Anthracite Coalfields," by Morgan W. Davies; "Mechanical Ventilators," by M. Walton Brown; "Tin-mining in Tasmania," by H. Ferd-Kayser; "Lake Superior Mining Ore Region, with Special Reference to the Mesabi Range," by Horace V. Winchell; "Machine Coal-mining in Iowa," by H. Foster Bain. During the course of the meeting, the members will visit the explosives testing apparatus, which is being erected by a departmental committee of the Home office, at the Royal Arsenal, Woolwich, in accordance with the requirements of the explosives in mines order made by the Secretary of State for the Home department, under the Coal Mines Regulation Act, 1896. The membership of the institution, founded in 1889, has increased from 1,239 to 2,500. The institution was founded with the object of promoting a more general recognition of the status of mining and metallurgical engineering as scientific professions, to supply information upon the practical requirements of legislation affecting these industries, and generally to promote the advancement of the sciences of geology, mining, metallurgy, engineering, and their industrial applications, by the interchange of opinions, by the reading of communications from members and others, and by discussions.

## INDUSTRIAL NOTES.

The Queenston Quarry Company, Niagara Falls, Ont., has been incorporated with a capital stock of \$50,000.

The Milton Wire and Roofing Company, Milton, Ont., has been incorporated with a capital stock of \$40,000.

The Bethlehem (Pa.) Iron Company's steel mill, which has been idle several weeks, will resume work on May 31st.

The Indiana Powder Company will build a mill at Fontanet with a capacity of 400 kegs of gunpowder per day.

The McIntosh Granite and Marble Company, Toronto, Canada, has been incorporated with a capital stock of \$48,000.

The Truro Foundry and Machine Company, Truro, N. S., recently shipped a carload of mining machinery to the Kootenay District, B. C.

In the Birmingham (Ala.) District there are at present 12 furnaces in blast, making an average of about 2,000 tons of iron each day.

The Chicago Mining Machine Company has been incorporated at Chicago, with a capital stock of \$80,000, by J. B. Paine, S. W. Bender and Frank White.

The Stilwell-Bierce & Smith-Vaile Company, Dayton, O., advertises a regular quarterly dividend of 2%, payable June 1st. Books close May 20th, reopen June 1st.

The Lake Medad Portland Cement Company, Hamilton, Ont., has been incorporated with a capital stock of \$150,000, to manufacture all kinds of hydraulic and Portland cement.

The Fox Pressed Steel Company's Joliet, Ill., plant has been consolidated with its Eastern plant, which is located on McCandless avenue, Pittsburgh. Car trucks will be made at Joliet and the cars at Pittsburgh.

The Wheeling Iron and Steel Company's steel works at Benwood, W. Va., resumed in full on May 17th after being idle two weeks. The skelp department of the same mill started the same night, after long idleness.

A London syndicate of which Arthur E. Attride is president is said to be negotiating for the English patent (No. 5,952) of the Marshall pneumatic stamp mill. This mill is manufactured by the inventor, Capt. J. W. Marshall, in Brooklyn, N. Y.

The Greenville rolling mill, which was closed by the assignment of the Atlantic Iron & Steel Company, of New Castle, Pa., will probably start soon. It is stated that the company has enough orders on hand to keep the mill running for some time.

The Columbus & Hocking Coal and Iron Company's Receiver has been authorized by the court to issue \$85,000 receiver's certificates to pay the ex-

pense of operating mines and to enable the company to carry out some contracts in hand which promise to pay large profits.

The Moreara Enim Petroleum Company, of Amsterdam, and the Pennsylvania Tube Works, of Pittsburg, Pa., have closed a contract between them whereby the latter firm agrees to supply the former with 90 miles of pipe line for the Dutch Company's oil-fields in Sumatra.

The E. P. Allis Company, of Milwaukee, Wis., last week shipped two carloads of mining machinery to South Africa. The company has made and shipped to South Africa a very large amount of machinery during the past year, and is still receiving orders from that part of the world.

Spang, Chalfant & Company's puddlers employed at the works at Etna have refused to go to work at the wages offered. Some time ago the firm notified the puddlers that when the mill resumed the puddling rate would be \$4 a ton instead of \$4.50. When the men did go to work they were employed only four days.

The Oliver & Snyder Steel Company's new furnace stack, which is to be erected in Allegheny, Pa., alongside the Edith furnace, will be much larger than first intended. The plans have been changed to make it somewhat similar to the new furnaces of the Carnegie Steel Company, Ltd., at Duquesne, and will, therefore, be about 22 x 100 ft.

The new mill of the Carnegie Steel Company, Ltd., at the Duquesne plant, has gone into operation as a finishing mill for steel rails. Owing to the demand for steel rails from parties who placed orders ahead, the company was compelled to increase the capacity of output of rails. With this new mill and the two in Braddock the company can make 2,000 tons daily.

The Armorie Interior Conduit Company, the first of its kind in Pittsburg, Pa., and the second in the United States, is erecting a plant on the site of the old Pittsburg Tube Company's plant. The company, which operates a similar plant at Detroit, leased this old plant and is refitting it with special machinery. The enterprise will be devoted to the manufacture of insulated pipe lines, with wood for electrical conduit purposes.

The Acme Malleable Iron Works, of Buffalo, N. Y., are erecting an absolutely fireproof building for the storage of their patterns. This building is 30 ft. wide and 60 ft. long. The building will be constructed of non-combustible material and the framework will be of steel, the covering of corrugated iron, and the racks supporting the patterns will also be made of metal. The Berlin Iron Bridge Company is furnishing and erecting the steel framework and covering.

An English syndicate recently closed a deal whereby English capital secures control of the patents and plants of the Ellwood City Weldless Tubing Company, with factories at Ellwood City and Greenville, Pa. The transaction involves almost \$3,000,000. The two plants will be greatly enlarged to manufacture weldless boiler tubing, as the seamless tube has displaced the welded tube for this purpose. The National Tube Company, of McKeesport, is also erecting a large weldless tube plant.

The Birmingham Rolling Mill Company has decided upon the erection of a steel plant. An open-hearth furnace which will turn out two heats every 24 hours, 40 tons to the heat, will be built. This furnace will be erected in the immediate neighborhood of the Alice blast furnace owned by the Tennessee Coal, Iron and Railroad Company, in which basic iron has been made for the past year. Whether this iron will be transported to the steel plant in molten condition is not known, but such a course will probably be adopted.

The Scranton Steel Company has held another directors' meeting, at which it was decided to distribute pro rata among the shareholders of the company the \$750,000 worth of stock of the Lackawanna Iron and Steel Company, received as a part of the consideration when the plant of the Scranton Steel Company was acquired by purchase by the Lackawanna Iron and Steel Company. The equity suit that the shareholders of the Lackawanna Iron and Steel Company have filed with the United States Circuit Court at Pittsburg will now probably be withdrawn. This suit was started because at a meeting held on April 30th a motion to distribute the stock referred to, pro rata, among the stockholders was voted down.

#### TRADE CATALOGUES.

Bolling & Lowe, 2 Laurence Pountney Hill, London, E. C., engineers and contractors, have published two very convenient wall charts, one of which shows standard sections of steel rails, and the other mining machinery, light railway, tip-wagons, etc., of which they make a specialty.

The Goben Manufacturing Company, Canton, O., gives in its recently published catalogue the catchy title: "The X-Rays Turned on Our Sky Scrapers." The product of this company has much to do with the sky scrapers in that it manufactures the "Carbonizing Coating," a protective paint for iron and steel. It is a chemical combination of pigments and

chemically prepared linseed oil. It is impervious to moisture and not affected by brine, sulphur, locomotive smoke, acids or alkalis, which are so detrimental to the life and durability of paint coverings.

The Sullivan Machinery Company, Chicago, Ill., on May 1st issued catalogue No. 28 in which the Sullivan rock drills, diamond drills and channeling machines are illustrated and described. The company has been engaged in the manufacture of rock-working machinery for the past 30 years, and its products are the outcome of these years of experience. The machines are not experiments, but a positive success, which has been demonstrated in competition with other makes. Wherever advanced mining methods are in use the Sullivan machines are well known, and the sale of these in every State in the Union and in most of the foreign countries proves the extent of their reputation.

#### 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.

#### 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 MAY 18TH, 1897.

582,655. APPARATUS FOR MANUFACTURING GAS. Ferdinand Logan, Phoenixville, Pa. The combination of a combustion chamber, checker-work fire-brick contained therein, water-legs forming the steam boiler surrounding the combustion chamber, a chamber containing oil mounted above the combustion-chamber, escape-flues for the products of combustion in the oil-chamber, and valved outlets for directing the passage of the products of combustion either directly from the combustion-chamber or through the flues of the oil-chamber.

582,667. APPARATUS FOR GALVANIZING METAL TUBES, BARS OR SIMILAR ARTICLES. Albert L. Murphy, Conshohocken, Pa. The combination of a tank for containing a bath of liquid spelter; compressing rolls exterior to the tank, which operate upon the article to be coated after it has received its coating within the bath, and wiping dies which operate upon the article to be coated after its coating has been subjected to the action of the compressing rolls.

582,669. ORE CONCENTRATING AND MILLING MACHINE. John McKinnon, Coifax, Wash. Assignor of one-third to C. W. Page, same place. The combination of a mortar having a series of discharge openings at intervals in its sides, a trough surrounding the mortar, amalgam plates located opposite the discharge openings of the mortar to receive the crushed ore herefrom and direct it into the surrounding trough, pulverizers for crushing the ore in the mortar, parallel concentrating pans, a chute communicating with the lowest point of the trough and having branches leading to the respective concentrating pans, and a gate for controlling the discharge through either or both of the branches of the chute.

582,683. EXCAVATING MACHINE. Morton E. Pugh, Chicago, Ill. The combination of an excavating dipper pivoted between its ends upon a handle, a fixed overhead boom secured to the framework of a traveling platform, a cable secured to the front end of the dipper and passing over a trolley pulley on the boom and then to a winding drum, a second cable attached to the rear of the dipper and passing by suitable pulleys to a second winding drum, a third cable secured to the handle above the boom and leading to a third winding drum, with power mechanism for operating and controlling the movement of the drums.

582,744. CAISSON. Edwin S. Jarrett, New York, N. Y. The combination of a suspender rod positively attached to the underlying rock and to the caisson and mechanism to apply a downward tension on the caisson and upward pull on the suspender rod.

582,745. AMALGAMATOR. Frederick G. Jordan, Spokane, Wash. The combination of a casing provided with overlapping plates, a runner-frame rotatable in the casing and provided with a flaring mouth, and radial vanes upon the interior and exterior of the runner-frame, of a bottom secured to the casing, and a pair of mulling disks.

582,791. PURIFIER FOR BLAST-FURNACES. Walter Kennedy, Pittsburg, Pa. The combination of a series of cone-shaped deflecting-plates, and a vertical water-pipe extending through the series and having side perforations to allow the water to flow over the cones.

582,817. BLAST-FURNACE. Frederick H. Foote, Chicago, Ill. The combination of a hopper portion, a feed-bell located centrally therein, a dumping platform surrounding the upper portion of the hopper, and a set of swinging doors arranged on the furnace adjacent to the hopper and forming in connection with the hopper an annular chamber having annular communication with and forming part of the smelting chamber so arranged that explosive gases may enter the same, open the doors and be expelled directly into the open air.

582,843. MUFFLE-FURNACE. Aron M. Beam, Denver, Colo. The combination of one or more combustion-chambers, a chimney co-operating therewith, one or more muffle-ovens integral with the combustion-chambers and chimney, a flue extending from the combustion-chambers under, around the farthest end of and over the top of the oven or ovens, and an air

or steam supply pipe embedded in the masonry of the furnace, a flexible or tubular feed-pipe connected with the air or steam supply pipe, and an air or steam inlet aperture into the oven or ovens adapted to receive the free end of the flexible air-feed tube.

582,892. SEPARATOR. Arthur V. Abbott, Chicago, Ill. Assignor to George E. Foss and Charles F. Noble, same place. The combination of a wash-box or spray-chamber, a series of perforated tubes communicating with the box or chamber each provided with a spiral core, blade, wing or feather, and a fan communicating with the tubes for drawing or propelling air or gases through the box or chamber and tubes.

582,903. CONVEYOR FOR COKE OR ANALOGOUS MATERIALS. James M. Lodge, Philadelphia, Pa. Assignor to the Link Belt Engineering Company, same place. The combination having buckets, a chute adapted to direct the heated coke into the buckets of the conveyor, with a water-supply so situated that the buckets will be charged with water prior to being charged with the heated coke.

582,923. ELECTROLYTIC APPARATUS. Alfred E. Hunt, Pittsburg, Pa. The combination of a number of pots or vessels electrically connected in series, and the several pots or vessels having metal platforms in electrical connection therewith.

582,936. ELECTRODE. Wilhelm Majert, Falkenberg, Germany. The process consists in first applying to the frame of the electrode a coating or filling of a soluble substance, then applying an active mass in contact with the coating, and finally dissolving the soluble coating so as to leave a free space between the active mass and the walls of the frame.

582,938. PROCESS OF MAKING FLUORIDES. Walter Mills, London, England. The process consists in heating together a mixture of ammoniac sulphate and calcium fluoride (fluor spar).

582,942. CHROME-BRICK. Niven McConnell, Munhall, Pa. A burned brick composed of a mixture of chrome ore and about 2% not more than 3% of alkali binding material.

REISSUE. 11,601. HYDROCARBON-BURNER. William R. Jewons, Cleveland, O. Original No. 463,629, dated Nov. 24, 1891. The combination of a pair of perforated tubes having a combustion-chamber between them and a partition at the top of the inner tube having a passage to allow a limited quantity of air to flow through the same, the passage being so located and so proportioned relatively to the aggregate area of the perforations in the inner perforated tube as to produce a diffusion and partial combination of the combustible vapors and air within the burner-flame.

#### GENERAL MINING NEWS.

##### ALABAMA.

In the coal district, the controversy between the miners and the employers with regard to the recent reduction of wages has been settled and the scale signed for another year. At present the coal mines are working on only about one half time, and it is impossible to predict the future policy of the operators, because such must be governed by the demand for coal.

##### ALASKA.

ALASKA MEXICAN GOLD MINING COMPANY.—This company reports the clean-up for the month of April as follows: Period since last return, 30 days; bullion shipment, \$53,153; ore milled, 13,206 tons; sulphurets treated, 437 tons; of bullion there came from sulphurets, \$14,666; gross expenses for period, \$22,638.

##### ARIZONA.

###### GRAHAM COUNTY.

ARIZONA COPPER COMPANY.—The return for April, as published by the company in Scotland, shows an output of 252 tons black copper and 428 tons matte; the total being equivalent to 452 tons black copper.

###### PIMA COUNTY.

TRES AMIGAS.—A rich gold strike is reported to have been made recently at this mine, at Oro Blanco. The ledge proper is about 4 ft. wide, all good-grade gold ore.

###### PINAL COUNTY.

ARCADE GROUP.—Hon. Thos. F. Weedon is putting up machinery on his group of mines in the Tortillitas, and will soon be making regular shipments of concentrates. The machinery consists of a 10-H. P. Weber gas engine, a concentrating mill, a Blake crusher and a Hartz jig sizer. The Arcade mine at a depth of 125 ft. has a 4-ft. vein of ore.

###### YUMA COUNTY.

LA FORTUNA MINING COMPANY.—A new and rich body of ore is reported to have been lately encountered in the bottom of this company's mine, at Fortuna. The main shaft is now down about 500 ft.

##### CALIFORNIA.

The new mining law which took effect May 26th requires any person or persons locating a lode or vein to do at least \$50 worth of work on the claim within 60 days after filing the preliminary notice. This, of course, does not interfere with the requirements of the United States law, under which the yearly assessment work on a claim will be required as usual. The new State law also requires in the case of placer locations that \$10 worth of work must be done on each 20 acres located within 60 days after the location is made.

###### AMADOR COUNTY.

(From Our Special Correspondent.)

BALIOI.—At this mine, just east of Sutter Creek, Superintendent S. R. Porter reports that 5,885 tons of ore was mined and milled during the month of April at a cost of 60c. per ton. This is probably the

most economically conducted mine in the State. The 40-stamp mill is running night and day, and large bodies of low-grade ore milling from \$3 upward are blocked out. On the property are five parallel veins, the main one of which, 100 ft. in width, is being developed through three tunnels, the upper one, No. 3, crossing the vein at a depth of 140 ft. below the croppings. The ore being milled now comes from this tunnel and is handled by gravity.

**GOVER.**—On account of the sudden death of William B. Carr, of San Francisco, who was developing this mine, two miles north of Amador City, the men have been laid off, and nothing will be done at present except keeping the pumps going.

**IRON MASS.**—The vein at this mine, three miles north of Volcano, is at present from 1 to 3 ft. in width. A mill run of 500 tons yielded \$28 in free gold and a large percentage of sulphurets. Considerable development work has been done and the shaft is now down 200 ft. A new hoist and pumping plant will be put in and the shaft sunk to the 500-ft. level. The 24-H. P. engine at the Thorpe mine at Fourth Crossing is being moved to this mine.

#### CALAVERAS COUNTY.

(From Our Special Correspondent.)

**BUND.**—The shaft at this mine between Altaville and Fourth Crossing, is down 275 ft., and a tunnel is to be run at the 300-ft. level to crosscut the ledge. At the 200-ft. vein, showing about 25 ft. in width, mills \$4 in free gold, besides the sulphurets.

**EDNA.**—At this mine, three miles north of San Andreas, near Spring Gulch, a four-stamp mill is in course of erection, and other improvements are being made. The mill is only used for the purpose of testing the ore as sinking progresses, to a depth of 1,000 ft.

**VALLECITO.**—At this mine, near the village of Vallecito, a rich strike has been reported. Some \$1,500 has been taken out and the pocket still continues to produce.

#### KERN COUNTY.

**ALAMEDA.**—A rich strike was made in this claim, in the Kramer Mining District, in the Val Verde Hill. When the ledge was first opened it was supposed there were about 4 ft. of ore between the walls, but what was then the 4-ft. wall has developed into a ledge.

#### NEVADA COUNTY.

**GODING.**—This mine at You Bet has been closed down under an injunction issued on complaint of the Anti-Debris Association. The association charges that the mine has been working in violation of the provisions of the Caminetti law, hence the injunction was served. A committee of the Sacramento Chamber of Commerce was on the spot with a delegation of Nevada people investigating the charges that the mine was working illegally, and they join with the miners in condemning the action of Manager Phipps and his association. The owners claim that the mine is being worked by ground sluicing, while the Anti-Debris Association maintains that it is being worked by the hydraulic process.

**MARY.**—This mine, in the Nevada Mining District, has a tunnel 1,000 ft. long, which cuts a 20-ft. ledge at a depth of nearly 500 ft. The pay chute is about 7 ft. wide. The tunnel is being driven ahead to tap the Homestake, which is large and rich on the top.

**NEVADA CITY MINING COMPANY.**—This company has accepted the offer made by the London Exploration Company, of which Thomas Mein is the representative, and in all probability the latter company will take charge of the property in a short time. The exact purchase price is not known. It is proposed to reopen the mine the coming summer, and systematically develop it.

**TREADWELL TUNNEL COMPANY.**—This company is the successor of the Grass Valley Railway and Tunnel Company, which was organized several years ago. The Treadwell Tunnel Company proposes to develop and drain the mines of the Nevada City and Grass Valley districts at a depth of 1,400 ft. in a vertical direction; and the tunnel, when completed, will have a length of nine miles. Mr. George A. Treadwell is at the head of the enterprise.

#### PLACER COUNTY.

**HERMAN.**—Work has been resumed at this mine at Westville, with a force of 28 men. The company is preparing to use compressed air, conveyed from a power plant 4 miles distant.

(From Our Special Correspondent.)

**LIVE OAK.**—This drift mine, two miles northwest of Forest Hill, has been idle for some time. The present management is doing some prospecting, and if the results are as anticipated, hydraulic mining will be commenced the coming season.

**MAYFLOWER GRAVEL MINING COMPANY.**—This company is making rapid progress toward hydraulic mining the McCall pit in Young America canyon. Mr. F. Chapellet, the managing director, reports that in opening up a tunnel some rich gravel has been struck, and the future prospects of the mine are very encouraging.

#### SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

**ALAMEDA.**—At this mine, in the Kramer min-

ing district, development work has opened up a rich ledge, which it is said is over 15 ft. in width, milling as high as \$200 per ton.

#### SHASTA COUNTY.

**BIG IRON MOUNTAIN.**—At this mine, near Redding, a cave-in occurred on May 22d in one of the lower levels by which 60 men were caught. Fifty-five escaped before the walls of ore fell in. Of the five cut off, one died of injuries and others are badly crushed.

#### TUOLUMNE COUNTY.

(From Our Special Correspondent.)

**ATLAS.**—This mine, near Tuttle town, is reported to have been sold to a Scotch company. The property is opened up by a 200-ft. tunnel and an open cut.

**BELLE.**—This mine, 1 mile northwest of Tuttle town, on the Mother Lode, has been bonded by George Blake and others. Arrangements are being made to put in a hoisting plant. The claim has been developed by a crosscut tunnel and drifts run north and south on the vein.

**DUTCH.**—At this mine, at Quartz Mountain, a drift is being run at the 300-ft. level. The vein shows 18 ft. of rich ore. The milling plant is being increased to 20 stamps. The hoisting and pumping plants on the ground will be sufficient to take them down 2,000 ft. Arrangements are being made to handle the rich sulphurets. A. Trittenbach is superintendent.

**GOLD CLIFF.**—This mine, at Tuttle town, south of the Arbona, is being operated by San Francisco parties, who have made contracts to run 600 ft. of drifts and tunnels.

**MARIETTE.**—This mine, at Tuttle town, has been pumped out and active development work will be commenced immediately.

**STREET & GROSS.**—This property, at Tuttle town, is being worked by Richards and others. The shaft is down 200 ft. and the 6-stamp mill is kept busy on good ore.

#### COLORADO.

In the United States Circuit Court in New York Judge Lecombe has handed down an amended decree in the action of James C. Spencer against the Cashier & Champion Mining Company, the New York & Colorado Mining Syndicate and Company and other companies and individuals, ordering that the fees and compensation of James C. Spencer, for his services as trustee and counsel of the several parties to the action, be fixed at \$12,500, payable in the bonds of the Cashier & Champion Mining and Tunnel Company, and that amounts already decreed to be paid for advances and money paid out shall be paid in the said bonds at their face value, as follows: To Hugh J. Jewett, \$5,443; to Emma E. Hurlbut \$3,905; to James C. Spencer, \$11,426. It is further ordered that on receipt by the complainant, as trustee, of the mortgage bonds to the aggregate amount of \$200,000, he shall set aside sufficient of the bonds for the payment of the several amounts awarded by the court.

#### CLEAR CREEK COUNTY.

**EAGLE.**—Mr. Augustus R. Specht, manager and treasurer of this mine, sends us the following: "In your issue of May 22d I notice an account of what is being done on the Eagle, which is somewhat misleading. The facts are these: The main shaft on the Eagle is down 350 ft. Levels have been started northeast and southwest at 325 ft. The southwest level is now in 160 ft., and the contract let was to carry that 100 ft. further. We have run on an average of 5 ft. of mill dirt, varying as it will on the vein from 4 to 10 ft. in different places. A crosscut has been made at 40 ft. from the shaft in the southwest level, and an upraise at 150 ft. from the shaft, the upraise running in solid milling ore carrying some smelting ore. The northeast level is in about 100 ft. We have done that work by day pay, also put a crosscut 50 ft. from the main shaft through to the foot wall. We find the vein matter is mineral-bearing for 25 ft. We are also taking some smelting ore from the breast of the west drift with the mill dirt. We expect to have our mill completed by August 1st for treating our own ores."

#### DOLORES COUNTY.

(From Our Special Correspondent.)

**EMMA.**—This mine now has 12 carloads of high-grade ore ready for shipment. Considerable new development is to be done shortly, and the force will be increased accordingly.

**ENTERPRISE.**—One hundred men constitute the working force at this point and large shipments are the rule. The mine was entirely renovated and repaired during 1896, under the management of Mr. P. S. Rider. During that year its shipments amounted to 1,700 tons, averaging 2.15 oz. gold and 17.16 oz. silver per ton. Shipments this year have so far been on the increase.

**MADAME DE FORGE.**—This property, located on C. H. C. Hill, and owned by Rhode & Konig, is being operated by means of a tunnel, driven with the intention of cutting the ore chute a short distance ahead, which will be accomplished by June 1st.

**RICO SMELTING AND REFINING COMPANY.**—It is now assured that the smelter erected by this company two years ago will soon start up again under

a new process, capital having been secured to transform it either into a fire concentrator or a pyritical reduction works. It is calculated that \$3,000 will amply meet all requirements in making the change, and that sum has already been subscribed. The new plant will be capable of handling from 75 to 150 tons per day, but can be made to pay on 30 tons daily.

#### GILPIN COUNTY.

**MABEL GROUP.**—This group, in Russell Gulch, has been transferred to Eastern parties for \$65,000 cash. The property includes the Mabel, the Washington and three other claims, all patented, which have been worked through an 850-ft. tunnel. The group is now, and has for some time been, working and shipping ore, employing an average of 35 men. The deal was pending for some time. The purchasers decline to give any information regarding their plans, which are not yet perfected, but it is understood that they propose to make extensive improvements and largely increase the force employed.

#### LAKE COUNTY.

(From Our Special Correspondent.)

**BIG SIX.**—These people have been doing very well recently on the Nettie Morgan shaft of their property. The ore body, it is understood, is opening out in good shape and several good finds have been made during the past few weeks. Improvements to facilitate shipments have been made and an increased output is promised in the near future.

**MAHALA MINING COMPANY.**—The Mahala people are shipping from the main ore body and are taking out about 50 tons of ore per day. The big steam pipe line which is being extended will aid greatly in carrying on the work.

**SMELTER SITUATION.**—Some very important changes in the status of the smelter situation will occur at Leadville at an early day, and from the outlook at this writing, I can safely predict that within 60 days at least two more, if not three, of the smelting plants now lying idle will have resumed operations. With reference to the Union smelter now closed down, nothing is given out by the owners; but if there is no hitch in the proceedings, I understand that it will be sold to Eastern parties, and they will start it up at an early day. In fact I believe that the sale has been made even at this time, but neither the purchasers nor the parties who sold are ready this week to announce the deal. The big Bimetallic smelter will blow in within 30 days if certain negotiations now pending go through. And as this is likely to happen there appears to be no doubt but what this plant will blow in during June. Your correspondent saw Mr. Franklin Ballou, the general manager of the concern, with reference to the matter, and he admitted that the possibilities of getting matters arranged so as to start up early next month were good. But one of the most important new smelting propositions is the blowing in in about three weeks of the new plant at the grounds of the old Elgin Smelting Company. The construction of this new plant, although comparatively small to start with, is attracting general attention, and the new process will be of great value to the camp. The new proposition is to handle the zincous ores of the camp. One furnace only is being erected now and will be put in blast, as above stated. It will handle 50 tons of zincous ores per day. The zinc ores of the camp have never been handled before because there was no process for successfully handling them. The inventor of the new process is Mr. Marcus Ruthenburg, and he is personally looking after the erection of the furnace and the inauguration of the process here. He was for many years in charge of the government electrical work in the navy yards in Philadelphia. It is understood that capitalists of that city are interested in the new enterprise. It is proposed by the gentleman to treat ore carrying as low as 10 oz. silver; 5% lead and 30% zinc, and to make it pay. Such class of ore has never before been handled here, and there is a great amount of it that could be mined. In my last letter I called attention to the fact that the A. Y. & Minnie would likely be started up. In this property there is a great quantity of this class of mineral, and a process to handle it successfully would greatly assist these people in operating a property that has long lain idle on account of the low grade ore not paying to mine. If the new process is a success, which can be proven by the one furnace now being built, it can readily be seen how important to the mining industry of the camp this will be.

**TWIN LAKES SECTION.**—This section of the camp promises to be actively developed this summer and there is considerable work already well under way. There is considerable snow to interfere with shipments in some parts of this section as yet, but this is now fast disappearing and some ore is coming in from there to the smelter. Two tons of ore from the Mountain Quail have been brought in and is expected to net the owners about \$150 to the ton. The Quail has opened up a vein from 4 to 6 ft. wide with a pay streak from 4 to 14 in. On the Gordon quite a force of men is at work blocking out the ore. The management is figuring on a sale of this property. On the Mt. Elbert tunnel enterprise, Manager Phillips is arranging to start work at an early day. A fine plant of machinery has been put in place and

the tunnel will be pushed in over 5,000 ft. with air drills. Twenty veins are known to lie ahead of the bore and they will all be cut at a great depth. The Bwyloch Company is pushing work on its ground and will soon start its mill. Lessees on the Gold Hill group have at a depth of 70 ft. exposed a 3-ft. body of ore running \$10 per ton and some of the assays are exceedingly rich. The Cornelius in the same vicinity is to be operated in the near future as they have a very good showing. In the Lone Hand mine a fine body of ore was recently encountered in a winze. Assays gave returns as high as 14 oz. gold per ton and in running a crosscut a 10-in. streak of ore has been encountered running \$25 in gold to the ton. Developments on the Laester show a 30-in. pay streak, 13 in. of which is shipping ore running 3 oz. gold to the ton. Arrangements have just been completed for the starting up of the Harlan mill which will run on the ore from the Kearsarge which is in 700 ft. and will ship steadily from now on. It is understood that several Eastern capitalized companies will operate in this section during the summer.

**WELDON MINING COMPANY.**—As stated last week, this property is now out of the hands of the receiver. Mr. Dennis Sheedy, president of the Globe Smelter, of Denver, is one of the principal owners of the Weldon and was here this week. He states that the property will be started up just as soon as the pumps arrive, and vigorous work will be prosecuted. During the time that the property was worked by the receiver the ore taken out amounted to \$95,191. Of this amount \$68,000 was paid out in dividends, and it required a little over \$22,000 for running expenses. It has been about 8 months since the downtown pumps shut down, and during that time the water in the Weldon has risen over 200 ft.

#### LA PLATA COUNTY.

**PRET, TRACHSLER & COMPANY.**—The long crosscut tunnel run to the Small Hopes vein at a depth of some 250 ft. below the surface workings has cut the vein, and exposed a body of gold ore worth \$90 a ton of the same character and quality exposed in the shaft. Owing to location and excessive water, development was retarded last fall, and the owners concluded to run a crosscut tunnel to tap the vein as above indicated. Up to the present time there has been no deep mining in the La Platas. Drifts will be started at once.

#### OURAY COUNTY.

(From Our Special Correspondent.)

**ARAPAHOE.**—This property, located in an unexplored district a few miles north of Ouray, on Cutler Creek, is attracting attention by a strike made a few days ago in an old and long unused shaft. The ore is bromide, carrying from 500 to 800 oz. silver, and was found in a vein 2 ft. wide under the contact in the white line.

**COMMODORE FOOTE.**—A strike of unusual richness has been made in this property, in Horseshoe Basin. The ore is of a gray copper, containing large quantities of wire silver, and is found in a 12-in. streak. Only four men are now employed, but the force will be largely increased as soon as stoping ground can be opened up.

**COPPER QUEEN.**—Holt & Foster are pushing development on the Copper Queen, situated near the Grizzly Bear, and have an immense body of high-grade copper ore. Arrangements have been made to begin shipments as soon as the Fowler smelter is ready for operation.

**DANIEL BONANZA.**—Another carload of high-grade ore was shipped week of May 17th, with highly satisfactory results. A lot of 20 tons of second-class ore will also be sent down to the mill in a few days.

**FOWLER SMELTER.**—The contract has been let and work is now well under way for connecting this smelter with the city pipe line. The smelter will be ready for operation between July 1st and 15th. The sampling department will be ready to receive ore for testing on May 29th. This department is under the management of Mr. A. B. C. Davis, a well-known chemist, formerly of Chicago.

**MONITOR.**—The owners of this group have leased it to Gould & Morgan, who will prosecute work with vigor during the summer. Considerable ore is exposed in the breast, which will be shipped to the Fowler smelter.

**MONO.**—McGranahan & Ferrer, of Delta, the owners, are in Ouray, preparing to resume operations on this group with a large force of men. The Mono is situated in close proximity to the Grizzly Bear, near Bear Creek Falls, and is considered one of the most valuable groups in the district.

**O. & N.**—This company will in a short time resume driving its incline in order to reach the ground which was first intended as the objective point. It is estimated that 500 ft. more of driving will be required to carry the breast to its destination. Seven large pockets of rich gold ore are being developed, and numerous old drifts and levels are completely filled with sacks of ore, the ore-houses being already overloaded and the production far exceeding shipments. The ore-house erected a short time ago is to be enlarged by doubling its present size, and more pack stock is to be imported in order to handle the output. The new compressor is now also in working order.

**SMUGGLER.**—This was one of the largest producers of low-grade ore in Ouray County previous to

its suspension. It is located just north of the city limits. Arrangements are now being made to resume work on this property, the product to be shipped to the Fowler smelter. The ore is found in one massive chute and averages \$20 per ton in gold-copper with a large percentage of sulphur, a very desirable class of ore for matte smelting.

**TRUST-RUBY.**—This company, operating in the Sneffels District, south of Ouray, is giving employment to 30 men in the mine and mill. About 25 tons of fair-grade gold ore are treated daily at the mill. For the first time in its history, this property appears to be running on a paying basis, although the ore is neither richer nor more abundant than when first discovered. It is intended to add electric power in a short time by connecting with the line of the Telluride Power Transmission Company, which has extended its wires to a point in Marshall Basin, just over the range from the Trust-Ruby.

#### SAN JUAN COUNTY.

(From Our Special Correspondent.)

**LETTER B.**—Another vein of good milling ore, 7 ft. in width, has just been struck, which is supposed to be a continuation of the famous Paul lead.

**NORTH STAR.**—A shaft was recently sunk 25 ft. on a small streak of rich gray copper. Several stopes have also been driven, all of which are in good ore. The present output is 2 tons of high grade and 3 tons of 90-oz. silver ore per day. Some lower-grade ore is also being stored away for future treatment at the company's mill.

**RED & BONITA MOUNTAIN MINING COMPANY.**—This company has increased its force to 12 men and the indications are that the ore body is now close at hand.

**ROBERT BONNER.**—Eight carloads of ore were sent down from this property May 15th, as a result of the past month's development. The ore is rich in silver and copper.

**ROYAL TIGER.**—Mr. Kunkle and others have put on 12 miners, and the output has been increased to 10 tons daily. The trail is being cleared to the Iowa tram, which will be used in transporting the output to the mill. The ore runs 55% lead, 25 oz. silver and 1/2 oz. gold per ton.

**SHELANDOAH No. 3.**—Five feet of good milling ore has been exposed in the breast of a drift in the lower workings, which abounds in lead and gray copper. This property is being worked under lease by Henry Bennett, and gives employment to eight men. The output at present is five tons per day. Much ore has been stoped out, which gives mill runs of 35% lead, 150 oz. silver, 1 oz. gold and 7% copper, besides several large blocks of second grade running about \$40 per ton.

**SILVER LAKE MILL.**—This plant is to be enlarged at once in order to successfully handle the increased output from the mine. Two new Root boilers of 120 H. P. each are to be added, increasing the capacity of the mill to 50 tons of concentrates every 24 hours.

**SUNSITE.**—A tunnel 110 ft. in length has been run on the vein, which averages 5 ft. in width and carries an 18-in. pay streak. The owners estimate the average value at \$50 per ton.

**VETA MADRE.**—Manager C. C. Bean, of this mine, just returned from London with funds to push work during the summer, and will begin at once. This property is on Galena Mountain.

#### SAN MIGUEL COUNTY.

**SMUGGLER UNION MINING COMPANY.**—At the annual election of this company the old officers were re-elected as follows: President, J. A. Porter; vice-president, Richard Pearce; secretary and treasurer, A. H. Fowler; and Anton Eilers, J. B. Grant, William D. Bishop, Jr., and W. A. Bell, directors.

(From Our Special Correspondent.)

**BELLE CHAMPION.**—This property, located at Saw Pit, is shipping 2 to 3 carloads of gold and silver ore per week, which yield good returns. Heavy development work is being vigorously prosecuted. The Belle Champion group is owned by James McKay, of Pittsburg, Pa., and his son, J. Albert McKay, is general manager.

**BUTLER.**—This mine, located at Ophir Loop, is undergoing systematic development and will soon be in such condition that shipments can be materially increased. The first-class ore runs \$90 per ton in gold, silver and lead. The mine is owned by F. P. Mogensen, whose post-office address is Ames.

**CANTON.**—This property, located in Bear Creek, is being worked under lease by Denver parties, and a large vein of fine gold quartz is regularly opened up by east and west drifts on the lead from the intersection of a crosscut tunnel, 532 ft. in length, and an upraise from one of the drifts to the old workings, a distance of 150 ft. The surface tramways, a quarter of a mile in length, between the mine and the Telluride Power Transmission Company's 120-stamp mill, has been put in condition for operation, and T. F. Van Wagenen, one of the lessees and superintendent, will soon commence to move ore down for treatment.

**JAPAN MINES COMPANY.**—Walter Beam and David Smickhimer, two of the largest stockholders, arrived in Telluride a few days ago, and have put the mines and mill in operation with a force of 80 men. The concentrating plant has a capacity of treating 40 to 60 tons of mineral a day, which yields

from 10 to 20 tons of concentrates. The high grade is shipped in its crude state to smelters and nets from \$750 to \$1,000 a carload. The Mikado Mining and Milling Company, composed of the same stockholders as the Japan Mines Company, has resumed driving its crosscut tunnel, which is worked through the Japan mine, ahead to intersect a western extension of the Tom Boy vein, which is included in the territory taken in by the Mikado tunnel site. The tunnel is now in between 1,400 and 1,500 ft., with less than 200 ft. to drive to reach the objective point.

**LONDON EXPLORATION COMPANY.**—H. Bratnaber and John B. Farrish, well-known mining experts, who examined the Tom Boy mine previous to its purchase by this company, have for several days past been engaged making an examination of the Butterfly & Terrible mines, near San Bernardo station, on behalf of the Exploration Company. K. Benson, the owner of the properties, has ceased work on a concentrating plant he was constructing for the treatment of the ore while a sale of them is pending.

**NORTH AMERICAN EXPLORATION COMPANY.**—For more than a week past this company has been packing ore down from the Nellie, Bear Creek, which it is working under an option, to the Telluride Power Transmission Company's 120-stamp mill for treatment, which will be the method of transportation until a Huson tramway is erected between the mine and mill, a distance of about 5,000 ft., which it is understood will be in the near future. This company is also prosecuting exploitation work on the El Dorado group of gold properties, near Trout Lake, owned by L. C. Leslie, and taking out some very good ore.

**SMUGGLER-UNION MINING COMPANY.**—This company recently commenced driving a tunnel on a large and well-defined vein, crossing the Smuggler-Union, Sheridan-Mendota lead at an angle of 15°, on which are consecutively located the Pennsylvania, Revenue and Ansbury, belonging to the Smuggler-Union Company. After the tunnel has been driven in a distance of about 3,000 ft. it will intersect the Smuggler-Union vein 500 ft. below the lowest of the present workings at a point vertically beneath the bottom of the Union shaft. A large pocket of rich gold ore was recently broken into on the north end of the Union. A single chunk of the ore brought down for shipment was valued at \$6,000. The mineral is mined by trusted employees and conveyed to town under guard. A. G. Kirby, formerly of California, is erecting a building 400 ft. long by 30 ft. wide, just below the Smuggler-Union 50-stamp mill at Pandra, in which he will install machinery and devices for treating tailings from this mill, having secured a lease on them. He has treated tailings from some of the largest mills in California by his process with remarkable success. It is said that not more than 60% of the values carried by Smuggler-Union ore is now saved by the mill. The mill treats 180 tons of mineral every 24 hours, which are concentrated into about 30 tons of concentrates.

**TOM BOY GOLD MINES COMPANY.**—The mill tunnel crosscut is now in a distance of nearly 2,000 ft. The lead will be intersected 400 ft. below the upper workings, and after it is cut extensive exploration work will be inaugurated and connection made with the upper workings for air. The mine and mill are running full capacity, the latter treating 150 to 175 tons of ore a day, which runs \$20 in gold per ton.

**VALLEY VIEW GOLD MINING COMPANY.**—A bucket tramway is being erected between this company's mines and 10-stamp mill on Marshall Creek, a distance of 2,000 ft., and it will be ready for operation June 10th, when the mill will be started running, and the force on the mine largely increased.

#### GEORGIA.

##### BIBB COUNTY.

**GEORGIA GRANITE COMPANY.**—This company, whose main office is in Macon, is about to erect a plant near Holton, on the Southern Railway, about 78 miles from Atlanta and 9 miles from Macon. It is the intention of the company to equip the quarry with a sufficient number of side tracks to accommodate about 30 to 40 cars and to erect a Locke-Miller patent Lidgerwood cableway of about seven tons' capacity, with which all the cars will be loaded. The company has a contract for furnishing jetty stone for the United States government, to be used in Cumberland Sound. The contract calls for 150,000 tons.

##### IDAHO.

##### BLAINE COUNTY.

**BULLION.**—About 30 tons of ore are on the dump and a body of galena is in sight that is 2 ft. thick by 70 ft. long.

**CRÆSUS.**—A force of 8 or 10 men is at work on this property. A lot of new machinery for the mill is now on the way.

**YOUNG AMERICA.**—This claim, in Smoky Gulch, owned by John Gorman, will soon be shipping ore. An 8-ft. vein runs from \$15 to \$20 per ton in gold.

##### ELMORE COUNTY.

**MCGINNIS.**—The ledge on this mine, on Black's Creek, is being opened up and shows 12 ft. of vein matter, 8 ft. of which averages by assay \$9.75 and the remaining 4 ft. is a rich quartz. The owner is J. D. McGinnis.

## IDAHO COUNTY.

**HECTOR MINING AND MILLING COMPANY, LIMITED.**—This company, of Florence, has recently been organized for the purpose of dealing in and developing mines. It has a capital stock of \$500,000, and the directors are F. J. Boyer, M. M. Thompson, G. M. Steeley, M. B. Morrow and E. M. Watson, all of Florence.

## LATAH COUNTY.

**BLUE JAY GOLD MINING COMPANY.**—The Blue Jay has passed into the hands of this company, with a capital stock of \$1,000,000. The ore is of a sulphide character, yet free milling. The vein is about 5 ft. wide, carrying 3 ft. of good ore. Active work will be commenced at once. A mill site and water right on the Cummerine has been secured by the company.

**GOLDEN GATE.**—They are getting out timbers for 150 ft. of shaft. The company has decided to put in a small mill for prospecting purposes, and if development work is satisfactory a mill of larger capacity will be erected sufficient to handle the total output of the mine. It is the intention to mill custom ores when the Golden Gate is unable to keep the mill supplied.

## LEMHI COUNTY.

**AMERICAN DEVELOPING AND MINING COMPANY.**—This company has purchased the Bull of the Woods mine between Sage Creek and Gibbonsville. The company is credited with having turned out 240,000 in gold bullion last year. It is understood that a duplicate of the mill at Gibbonsville will be built at the Bull of the Woods mine this year.

**MONOLITH MINING COMPANY.**—This company, of Boise City, is erecting a 20-stamp combination mill on its property.

## NEZ PERCES COUNTY.

**IRWIN.**—This ledge, in the Rapid River District, is said to be 840 ft. wide. It is low-grade gold ore, with some copper. This property has been bonded for 60 days by Carr & Parker in the sum of \$70,000. The ore is refractory, and the surface average is only \$2.50 a ton.

## OWYHEE COUNTY.

**DE LAMAR MINING COMPANY, LIMITED.**—The following is the return for the month of April: Crushed during the month, 4,260 tons; bullion produced in the mill, \$41,175; estimated value of ore shipped to smelters, \$610; miscellaneous revenue, \$60; total produce, \$44,835; total expenses, \$32,730; profit for the month of April, \$12,085.

## SHOSHONE COUNTY.

**BELLE OF THE WEST.**—This claim is up East Nine Mile and adjoins the Granite on the West. The tunnel is now in between 300 and 325 ft. and quite a sprinkling of ore has been found for some time.

**CONSOLIDATED TIGER & POORMAN MINING COMPANY.**—The Tiger-Poorman mine, at Burke, recently struck 8 ft. of shipping and 6 ft. of concentrating ore on the 1,200-ft. level.

**HELENA AND FRISCO MINING COMPANY.**—Extensive improvements are being made in the Gem, Cœur d'Alene District, by this company, the new owners. A hundred men are employed in developing the mine to a depth of 800 ft. The mill has been enlarged and will have a capacity of 800 tons a day. A new hoist is being put in capable of going 2,500 ft. and hoisting 800 tons at that depth. The engine will be set in a station underground, 1,200 ft. from the boilers, at the end of the tunnel where the station is cut. The new machinery for the mill, the overhauling of the mill, the building of a large vanner-room, the cutting of the big station for the hoist, the engine and the different levels will cost about \$225,000.

**IDAHO & BRITISH COLUMBIA MINING COMPANY.**—A crosscut is being run on the War Eagle, on Nine Mile, owned by this company, to tap the north lead, which is in 20 ft.

**NABOB & CRYSTALITE.**—These claims are in the Eureka District on Pine Creek, about 6 miles over the range from the Bunker Hill & Sullivan mines. The ore assays well in lead and silver. There are four tunnels of about 100 ft. on the property and another, the main tunnel, is 165 ft., which is below a shaft sunk 60 ft. It will require about 40 more feet of sinking on this shaft in order to reach the main tunnel. Mr. L. W. Gates, of Kellogg, is the owner of the property.

**STANDARD.**—This mine, up Canyon Creek, paid its owners \$73,000 profits last month, and its profits for the past year have averaged more than \$50,000 monthly. It is owned by John A. Finch and A. B. Campbell, of Spokane, and by capitalists in Youngstown, O. The mine is now putting out about 80 tons of concentrates daily. This requires the treatment of 18 cars of crude ore, amounting to about 375 tons. The capacity of the mill is 500 tons. Although the Campbell tunnel opened large ore reserves, arrangements will soon be made for blasting out a chamber on the tunnel level preparatory to sinking a deep shaft.

## INDIANA.

## PIKE COUNTY.

**PETERSBURG MINING AND MANUFACTURING COMPANY.**—The rock pressure of the Jumbo gas well, owned by this company, has increased to nearly 600 lbs., the first test showing 575 lbs. The volume of gas, it is said, will reach 5,000,000 cu. ft.

## KANSAS.

## CHEROKEE COUNTY.

(From our Special Correspondent.)

**MASTIN & SCHMOCK.**—At the pump shaft on the Mastin land, they are drifting at 150 ft. in rich dirt toward the Maud S. drift. At this shaft they drilled 209 ft., and struck a large body of zinc ore, this being the deepest zinc ore developed in Kansas.

**McCULLOUGH.**—On Geo. McCulloch's 20-acre lease of the William several rich strikes have been made, and now there are quite a number of prospect shafts going down.

**NATHAN & COMPANY.**—On the Union land they are sinking a pump shaft and are getting some good jack dirt at 40 ft. in open flint ground.

## MAINE.

## PISCATAQUIS COUNTY.

**MONSON-BURMA SLATE COMPANY.**—At the annual meeting recently the following officers were elected: President, M. W. Clark; treasurer and clerk, L. G. Paine; directors, D. W. Clark, Geo. P. Wescott, M. W. Clark, J. S. Gerrish, F. J. Larrabee, Geo. H. Gookins and L. G. Paine.

## MARYLAND.

## GARRETT COUNTY.

**GUFFY & COMPANY.**—James W. Hair, of Fairmont, W. Va., representing J. M. Guffy and others, of Pittsburg, has purchased 2,000 acres of coal land in this county, adjoining a tract of 3,200 acres in Preston County, W. Va., purchased for the same parties a few months ago. These purchases are preliminary to the building of a coal-developing railroad, which will cut through untouched territory. These lands also include territory which Guffy & Company propose to test for oil.

## MINNESOTA.

(From our Special Correspondent.)

**BESSEMER STEAMSHIP COMPANY.**—To the 22 ships this company owns or contracts, it has just added 15 more for June and July, and its carrying capacity will be increased by 500,000 tons, giving it about 3,000,000 tons capacity for the year. This increase is caused by additions to the amount of ore to be moved under the contract for carrying the Carnegie ore, and some sales by the Lake Superior Consolidated Mines, which are the property of the same interests as own the ships. These increases and the large tonnage to be moved for the Minnesota Iron Company and the Cambria and Mahoning interests indicate that all previous records for Minnesota mines will be largely exceeded this year and that not less than 6,000,000 tons will be shipped from the State.

**DULUTH & WINNIPEG.**—The terminal property of this road, including an ore dock of some 250 pockets, was sold last week under the general plan of foreclosure of the road, which has passed into the hands of Canadian Pacific interests. The road will this year handle four or five times as much ore as it has at any other time.

**MINNESOTA IRON COMPANY.**—Shipments of last week from the docks of this company were about 110,000 tons, and it is interesting to note that almost no ore was carried by any vessels but those of the company and that the cargoes averaged not far from 3,500 tons each. The company has just put in additional storage tracks for 1,300 cars at docks 3, 4 and 5.

## IRON—MESABI RANGE.

(From our Special Correspondent.)

**BIWABIK BESSEMER COMPANY.**—This company has resumed work at its mine at Biwabik, deciding not to take the option of the Consolidated Company for either the Adams or McKinley instead of the Biwabik. It is not supposed to have gained any reduction of the royalty demanded by J. M. Williams and the other owners. It is figuring on some additional stripping contracts with the Drake and Statton Company, who were a few days ago on the point of removing their material and plant to other ranges, but have decided to wait.

**CINCINNATI IRON COMPANY.**—This company has been almost drowned out by a flow of water struck in its underground workings. New pumps have been ordered and will soon be in position.

**COMMODORE MINING COMPANY.**—This company has already begun shipments and 75 men are working under contract in No. 1 shaft. No 2 will be opened at once and the contract system employed there also. The ore shipped is under a guarantee of 61% iron and 0.35% or better phosphorus, and the company has no fears but its ore will run better than this guarantee.

**FRANKLIN MINING COMPANY.**—This company has at last pulled the pumps at its Franklin group, consisting of the Franklin, Bessemer and Victoria shaft at Virginia, and one of the best mines on the Mesabi or in the lake region is filling with water. The real reason for this move is hard to understand, but it is believed to be something more than the mere fact, if fact it be, that its ore cannot be sold at profit, as stated. Bessemer and Victoria are both leased properties, belonging to W. C. Yawkey, of Detroit, Mich., at 25c a ton, and Franklin is a fee mine. There is considerable ore in stock at all the shafts; indeed practically all that has been mined since last fall is still there, and no steps are being taken to move it.

**MAHONING ORE COMPANY.**—At this property, one day last week, 4,450 lbs. of black powder were exploded in one blast to remove a 30-ft. bank in the stripping.

**OHIO MINING COMPANY.**—The advance payment by the Lake Superior Consolidated in its purchase of this mine included some \$13,000 royalties, enough to permit the removal of 5,000 tons of ore before additional payments. This ore, and probably more with it, is to be moved at once, and shipments to Duluth docks have begun.

**OLIVER MINING COMPANY.**—At its Mountain Iron mine this company is now shipping 300 cars, or 7,000 tons daily, and has all four shovels at work, the new 90-ton Vulcan being with two others in the stripping. The mine is employing about 300 men, and one day this week gave the village of Mountain Iron the first good-sized pay-day it has had for a year. At the Oliver mine of this company one day last week in six hours one shovel loaded into cars 154 carloads, or 3,500 tons. The mine is steadily loading about 150 cars and will put on a night shift at once.

**PENOBSCOT IRON COMPANY.**—The water struck in the northeast drift in this mine last week is still flowing heavy, and another big pump will be installed at once. This will make three large pumps and five smaller ones, each of the three big ones with a capacity for about 1,000 gals. a minute. Ore is now being hoisted and stocked.

**SPARTA MINING COMPANY.**—The stripping at this new property is well under way, and it is expected to be shipping ore in about 60 days, and to be able to continue from that time on. The contractors, Merritt & Company, of Chicago, are working a Lidgerwood conveying stripping machine, the first on the Mesabi on the job. The surface at this mine is from 16 to 20 ft., and the lower part of it is hardpan, in which stripping is slow work. The contract is for some 450,000 cu. yds., and will be continued for several years.

## MISSOURI.

## JASPER COUNTY.

(From our Special Correspondent.)

**JOPLIN ORE MARKET.**—Another week of fair weather and good prices for ore has been a boon to the miners of the Joplin District. While the top price of zinc ore fell off 50c. several lots that brought \$22 per ton on the previous week were advanced 50c. per ton, maintaining a stiff average price. Lead ore was quoted at \$20 per thousand pounds delivered all week, and the demand very strong. The corresponding week of last year zinc ore sold at \$20.50 per ton, top price, and lead ore brought only \$16.50 per thousand pounds delivered. The past week's shipment was an increase of 344,410 lbs. of zinc ore and a decrease of 108,000 lbs. of lead ore, compared with the corresponding period of 1896 there was an increase of 1,765,630 lbs. of zinc ore and 224,850 lbs. of lead ore. The surplus of lead ore in the entire district will not exceed 500,000 lbs., and the surplus of zinc is about 500 tons, being the smallest surplus in years.

Following are the sales of zinc and lead ores for the week ending May 22: Joplin zinc, 1,309,900 lbs.; lead, 247,560 lbs.; value, \$19,609. Cartersville zinc, 1,442,680 lbs.; lead, 213,610 lbs.; value, \$18,766. Webb City zinc, 688,530 lbs.; lead, 35,920 lbs.; value, \$7,949. Galena zinc, 2,389,000 lbs.; lead, 575,000 lbs.; value, \$38,875. Aurora zinc, 495,000 lbs.; lead, 25,000 lbs.; value, \$4,013. Alba zinc, 93,000 lbs.; value, \$1,024. Oronogo zinc, 125,230 lbs.; lead, 12,990 lbs.; value, \$1,599. Stott City zinc, 33,940 lbs.; value, \$373. Zincite or Belleville zinc, 46,410 lbs.; lead, 2,020 lbs.; value, \$530. Springfield zinc, 225,400 lbs.; value, \$2,587. Carthage zinc, 90,000 lbs.; value, \$990. District totals for the week: Zinc, 6,929,690 lbs.; lead, 1,112,100 lbs.; value, \$96,285. District totals for 20 weeks: Zinc, 129,967,670 lbs.; lead, 23,859,170 lbs.; value, \$1,631,467.

**AURORA MINING COMPANY.**—They are sinking their shaft deeper, and will put up a steam concentrating plant to handle the large face of disseminated zinc ore they struck at 70 ft.

**BALL, HENDRICKSON & MAGNIDE.**—They are pushing the work on their steam concentrating plant at the Blanche mine, on the north side of the Circle lease, and expect to start up June 1st. They have opened up a large body of ore at 55 ft.

**BODILY & COMPANY.**—On the Circle lease they are drifting at 50 ft. on a large face of lead ore, and will make their first turning-in this week.

**BOSTON COMPANY.**—This company, on the Leonard land in Chitwood Hollow, has struck a rich vein of lead and zinc ore in open ground at 115 ft.

**BROWN, WINTERS & COMPANY.**—They have been mining for some time on a tract of land owned by Patrick Murphy, just south of the Joplin cemetery. They have sunk a shaft through 40 ft. of lead dirt and found a body of zinc ore at 143 ft., and are still sinking in pay dirt.

**CENTER VALLEY MINING COMPANY.**—The pumps were started May 17th, and lowered the water 30 ft. in a week. The operators will commence this week to work the upper ground for lead ore.

**C. W. REED & CHAS. BLAIR.**—They are moving their steam jig plant from Midway to their lots on the Circle lease at Oronogo, and will have it running



in less than two weeks. They have opened up a large face of ore at 75 ft.

**ELEVENTH HOUR COMPANY.**—The company started two 16-in. Cornish force pumps on May 21st, and will have the water out in two weeks.

**GEO. CASE.**—He has shut down his lead smelter at Grand Falls, 3 miles south of Joplin, for a general clean-up. The past four weeks' run has yielded about a 70% average of lead from the ore smelted.

**LA TOSCA MINING COMPANY.**—This company has 4 acres of the Granby land at Oronogo and a fine steam jig plant that is producing about 50 tons of high-grade zinc ore weekly. Last week, in drifting at 115 ft., they struck a fine vein of lead ore on top of their face of zinc ore, and will now produce both lead and zinc.

**MAYBELLE MINING COMPANY.**—They have leased 40 acres of land adjoining the Thurman mines and south of the Rex Mining Company's land east of Joplin. Fifteen shafts are being sunk and several are taking out pay dirt. In one of them they struck lead ore at 46 ft., and after going through 20 ft. of it struck jack and have gone through 8 ft. of it.

**McKINLEY MINING COMPANY.**—At the pump shaft they have opened up a large face of zinc ore at 160 ft., making the second run of zinc ore, and they have also a rich vein of lead ore at 105 ft. They were sinking the pump shaft deeper to more thoroughly drain their lease when they struck this body of zinc ore. This lease at present is making a 100 tons of zinc ore and 20,000 lbs. of lead ore weekly on three steam plants.

**MOUND CITY COMPANY.**—The company has started up its large Worthington pump and the water is being lowered fast.

**SEVEN DEVILS MINING COMPANY.**—This company has leased several lots on the Granby land, and has put in a large pump and is draining the ground. Their large steam concentrating plant is nearly finished, and will be ready to start about the time the water is out. They will have a 25-ft. face of zinc ore at 105 ft. to commence work on.

## MONTANA.

### JEFFERSON COUNTY.

**HOMESTAKE.**—This mine, which is situated at the head of Warm Springs, 4 miles east of Clancy, is about to resume operations. It is the intention to erect a steam hoist and continue the sinking of the shaft from its present depth of 100 ft. In the bottom of the shaft there is 2 ft. of ore assaying well in gold and about 2% in copper.

**MINAH CONSOLIDATED MINING COMPANY.**—In the suit of J. O. Briscoe against this company he is allowed to foreclose the vendor's lien for which he contended. The Minah group is located near Wickes. It was opened by Briscoe, who operated it until March, 1890, when he sold to the Minah company, composed of English capitalists. He was to receive \$375,000 in paid-up stock and \$300,000. Of the money, \$100,000 was paid, \$50,000 was to be paid out of the mine, and \$150,000 was to be paid January 1st, 1891, and to secure the payment, stock to the amount of 51,000 shares was placed in escrow. It was to secure judgment for unpaid moneys and to determine the ownership of the stock that the suit was brought and for a vendor's lien on the property to secure payment.

### MADISON COUNTY.

**MONTANA SMELTING AND MINING COMPANY.**—At Twin Bridges men have been set to work grading for the smelter to be erected by this company, an organization comprising several business men of Butte. The plant will have a capacity of 30 tons per day, comprising one 30-ton water jacket and stack, with a No. 7 Baker blower, a Blake crusher, a complete set of Cornish rolls and a complete sampling outfit, which will be operated by a 60-H. P. Economic boiler and Hickey engine, all the product of the Anaconda Iron Works. The smelter will treat the gold, silver and copper products of its tributary mineral territory in Madison, Jefferson and contiguous counties, and will ship its bullion to the works of the Omaha & Grant Company for refinement. The plant will probably be in operation in about 60 days.

(From Our Special Correspondent.)

**CLIPPER GROUP.**—This group of claims, located about two miles from Pony, is furnishing about 40 tons of ore daily for the mill, which yields about \$20 per ton on the plates, and some \$75 concentrates. Shipments of high-grade base ore are also made to the smelters. The properties are extensively developed by tunnels, and have large bodies of ore. They are owned by Messrs. Eling & Morris, the latter being in charge of the mines and mill.

**DELANNAR.**—This mine, located at Norwegian, 5 miles from Pony, owned and operated by Judge Duncan, of Pony, is producing some \$200 gold ore, a recent shipment of a carload lot netting \$3,628 after all expenses were paid. The shaft is down 70 ft., where water was encountered. The pay streak is from 4 to 8 in. wide.

**EASTON.**—This mine, located about four miles from Virginia City, has started up again with a full crew at the mine and mill, after a partial shut-down of about six weeks, caused by the freezing of the water pipes which supplied the concentrator.

**GALENA No. 2.**—This mine at Richmond Flat, under lease to Kennedy, Moore & Company is down 100 ft., with a foot-streak of \$100 rock on the bottom.

**GARNET MINING COMPANY.**—At this company's property, three miles from Pony, experiments are in progress, under the supervision of Mr. Woods, to determine the best method of economically treating the ore.

**GOLD HILL.**—At this mine, located about six miles from Whitehall, seven men are at work developing the property.

**MAYFLOWER.**—This mine, nine miles from Whitehall, furnishes employment for 20 men. The shaft is down over 100 ft. Some ore is shipped, but it does not appear to be so rich as it was last year.

**MONITOR.**—This mine, located at Richmond Flat, employs about 20 miners. The ore, which averages over \$100 per ton, is shipped to Butte and other places for treatment. It is stated that there is a good deal of \$100 ore blocked out ready for stopping.

**OLD JOE.**—At this mine, about a mile and a half from Pony, the owners are busy putting in a new water wheel to run their five-stamp mill.

**REVENUE.**—At this mine, located at Richmond Flat, where the first successful cyanide plant in the State is still in operation, about 20 men are employed.

### PARK COUNTY.

**LIVINGSTON COAL AND COKE COMPANY.**—This company's plant at Cokedale, which has been closed down for nearly two years, is to be started up again. Oscar James, of Tacoma, Wash., and A. D. Hopper, president of the Butte Gas Works, have secured a lease on the property, and will begin work on mine No. 2 immediately. At present the plant will be run on a small scale, but later it is the intention of the company to run it at its full capacity.

**MONTANA COAL AND COKE COMPANY.**—The difficulty between this company, at Horr, and its employees has been settled and the men have gone to work again. The miners won the principal point for which they were contending—the right to organize and maintain a union. The operation of the mines has been most profitable to the company since J. E. Strong became superintendent, 16 months ago. At that time an indebtedness of \$165,000 existed. This debt has been reduced to less than half that amount and the affairs of the company are in good shape financially.

### SILVER BOW COUNTY.

Joseph Edwards is reported to have made a good strike on one of his quartz claims about 12 miles north of Walkerville. He is sinking on the vein, but just what depth has been attained is not known. The ore carries silver and copper.

**ANACONDA COPPER MINING COMPANY.**—William L. Ledford, in his suit against this company for \$46,498.50 damages, claimed to have been sustained by an alleged breach of a lease on the waters of the St. Lawrence & Anaconda mines, and used in a copper-precipitating business, obtained a verdict for \$1,300, which is just \$2 more than the Anaconda company had admitted owing Ledford, and which amount had repeatedly been offered him.

(From Our Special Correspondent.)

**ALEX SCOTT.**—At this mine, located about one mile east of Butte, operations are about to be resumed. The shaft is down 300 ft. and several small shipments of ore which worked over 60% copper have been made.

**ANDERSON.**—This mine, located in the southeast part of Butte, is shipping large quantities of ore, with about 35 men employed.

**MONTANA ORE PURCHASING COMPANY.**—This company is still trying to get the water out of the Nipper, and at present it is down to the 250 ft. level. It is intended to sink as soon as the water is out.

**PARROT COPPER MINING COMPANY.**—This company is keeping its smelter in operation with ore from the Parrot & Moscow mines. A lease was recently let on the Little Minch claim. At the company's new smelter at Gaylord about 130 men are employed.

## NEVADA.

### STOREY COUNTY—COMSTOCK LODGE.

**CONSOLIDATED CALIFORNIA & VIRGINIA MINING COMPANY.**—The official report of the operations in the mine for the week ending May 15th is as follows: 1550 level—From the top of the double compartment incline upraise No. 1, 68 ft. on the slope above this level a north drift has been advanced along the footwall 14 ft., passing through porphyry, clay seams and streaks of quartz assaying from \$1 to \$2 per ton; total length, 140 ft., which has been suspended. From the top of the incline upraise we have worked west 10 ft. and are putting in upraise timbers on the footwall, where we find streaks of quartz assaying \$3 and \$4 per ton. 1650 level—From the 9th floor south drift at a point 265 ft. in from its mouth an upraise has been started and carried up 9 ft., passing through a quartz formation, assaying \$1 to \$2 per ton; total height, 25 ft. From incline upraise No. 1 at a point 60 ft. above the sill floor of this level from near the end of the north drift an upraise has been started and carried up on the footwall 10 ft., passing through ore showing an average width of 4 ft.; total height above the sill floor, 31 ft. Our opening in the top shows a

length, north and south, of 10 ft. and a width of 4 ft. of good ore. The average assays from all around the top opening are \$65.85 per ton. We have extracted from this point with a few additional tons from the south drift from No. 2 upraise 82 tons of ore assaying per mine car samples \$50.07 per ton. The north drift, started from incline upraise No. 2 at a point 40 ft. above the sill floor, has been advanced 21 ft. along the footwall, passing through porphyry and quartz showing a streak of ore on the footwall one foot wide, averaging from \$40 to \$50 per ton. This streak of ore is undoubtedly the downward continuation of the ore streak discovered in the north drift from upraise No. 1, 20 ft. above, on the footwall. The total extraction of ore for the week amounted to 82 tons, the average assay value of which—per samples taken from the cars when raised to the surface—was \$58.17 per ton.

## NEW MEXICO.

### BERNALILLO COUNTY.

**SHERIDAN.**—Large quantities of high-grade ore have been opened up in this mine and work is being pushed.

### COLFAX COUNTY.

**WILLOW CREEK GOLD MINING AND MILLING COMPANY.**—This company has been organized with a capital stock of \$100,000. The incorporators are Thomas Robinson, B. Gresham and J. W. Galley, who will act as directors of the corporation for the first three months. The principal place of business is Elizabethtown.

### GRANT COUNTY.

**WILLIS.**—A. B. Laird has purchased this mine, west of Hanover Gulch, and has uncovered a good body of copper ore in the property.

### SANTA FE COUNTY.

**GOLD COIN.**—A fine vein of free gold quartz has been struck 1,000 ft. distant from the Carley-Aranda shaft near Golden. The new find is in the Gold Coin.

**SILVER STAR.**—J. C. Bender, the sole owner of this mine, has two shafts in the property, one 53 ft. deep and the other 62 ft. and is now arranging to commence tunneling. He is taking out good manganese ore, carrying gold and silver.

### SIERRA COUNTY.

**HILLSBORO GROUP.**—W. S. Hopewell, who recently sold these placer mines to a syndicate of Ohio and Pennsylvania iron men for \$160,000, states that final surveys are in progress for the pipe line and reservoirs. The plan is to span the Las Animas River with a dam of solid masonry 200 ft. long by 100 ft. in height and pipe the flood water thus stored 20 miles to the placer diggings. The cost of the undertaking will be \$750,000. The money for the work is in the treasuries of the three corporations engaged in the enterprise.

### TAOS COUNTY.

**BLACK WIZZARD.**—This mine, owned by Harry Brainard, has a well-defined vein of 22 in., at a depth of 20 ft. Shipments of ore commenced last week.

**DEADHEAD.**—William Walsen, is reported to have made a good strike recently in this mine. The vein is 4 ft. wide. This mine is located up Rose Canon, about three-quarters of a mile east of Red River. The tunnel is in about 100 ft. and the drift 20 ft.

**RED RIVER MINING AND INVESTMENT COMPANY.**—This company has been incorporated with a capital stock of \$1,000,000, and for the first year will be under the control of three directors—C. H. Nance, T. T. Smith and C. C. Cotton. The operations and business of the company are to be carried on in the counties of Taos and Colfax, and the principal place of business is Red River.

## NEW YORK.

### FULTON COUNTY.

**NORTHVILLE GRANITE AND MARBLE COMPANY.**—This company has elected Erastus Darling president; James A. Cole, vice-president; Wm. H. Hearn, treasurer; J. N. Johnson, secretary. Work is being carried on actively in the quarries at Northville.

## NORTH CAROLINA.

### M'DOWELL COUNTY.

**STONE MOUNTAIN GRANITE AND TIMBER COMPANY.**—This company has been incorporated, with H. L. Smith, of Norfolk, Va., president; G. W. Hinshaw, of Winston, N. C., vice-president, and Walter Sharp, of Norfolk, Va., secretary, for the development of granite quarries at Stone Mountain; capital stock, \$100,000.

### SURRY COUNTY.

**MOUNT AIRY GRANITE COMPANY.**—This company's quarries, near Mount Airy, are busily employed on large orders for paving blocks for Cincinnati and other cities, and on some large contracts for cut stone.

## OHIO.

### MAHONING COUNTY.

**LEADVILLE.**—This coal mine in Austintown Township has been purchased from P. L. Kimberly by Joseph N. McClure for \$5,000.

## OKLAHOMA.

## BLAINE COUNTY.

**CRYSTAL SALT WORKS.**—Large quantities of pure salt are being shipped to all parts of the territory from these works, west of Guthrie, near Okeenee. The salt is manufactured from a spring, which turns out about 30 bbls. every 24 hours.

## OREGON.

## JACKSON COUNTY.

Portland capitalists have secured a bond on the farm of E. B. Jennings near Table Rock and propose to sink in search of coal and petroleum, strong indications of which exist on the place. Mr. Jennings gets \$1,000 down and \$49,000 additional if the company finds what it wants and concludes to take the property.

## JOSEPHINE COUNTY.

J. C. LEWIS.—About 20 men are employed in this mine at Leland cleaning bedrock, and work is going on at the 600-ft. tunnel on the divide between Wolf and Grave Creeks for the new ditch from upper Grave Creek.

## PENNSYLVANIA.

## ANTHRACITE COAL.

**HILLSIDE COAL AND IRON COMPANY.**—It is officially announced that the Hillside Colliery of this company, which is located between Avoca and Moosic, will suspend operations completely for an indefinite period. The colliery is one of the oldest and best in that section, and employs about 425 men and boys, all of whom will be thrown out of employment. W. A. May, of Scranton, is general manager of the works, and Thomas Evans, of Moosic, is the local superintendent. Owing to the slack demand for coal the company is obliged to suspend one of its six collieries, and this one was selected because its stoppage will incur the least expense.

## MONTGOMERY COUNTY.

**EDGE-HILL MICA SCHIST COMPANY.**—This company has been incorporated to work quarries near Edge Hill. The incorporators are C. M. Seltzer and R. S. Neal, of Philadelphia; James J. Dale, of Trenton, N. J.

## NORTHAMPTON COUNTY.

**ARGYLE SLATE COMPANY.**—This company, of Bangor, was chartered May 21st, with a capital of \$50,000. The directors are: C. Miller, John W. Underhill, William Harding, Thomas Masters, Robert J. Vasseur, Albert O. Allen, Joseph H. Shull, W. Frank Lobb, Charles Kitto.

## WYOMING COUNTY.

**FIRE CLAY DEPOSIT.**—On Dutch Mountain, in Forkston Township, it was recently discovered that over 2,000 acres of land has clay on it to a depth of 8 ft. This clay has been found to be excellent fire clay, and it is being dug out and delivered on the cars at Mehoopany Station of the Lehigh Valley Railroad at \$6 per ton and is being shipped to New Jersey, where it is being converted into a marketable product.

## RHODE ISLAND.

## WASHINGTON COUNTY.

**RHODE ISLAND GRANITE COMPANY.**—This company has its quarries at Westerly busy on some large orders for building and paving blocks.

## SOUTH DAKOTA.

## CUSTER COUNTY.

**AMAQUEEN MINING COMPANY.**—The property owned by this company is situated near Custer Peak. A shaft was sunk on a vertical vein which has opened out to 4 ft. in width and is free milling. The vein has maintained a width of 4 ft. for the last 20 ft. in depth.

## LAWRENCE COUNTY.

**BUMBLE BEE.**—Free milling ore has been discovered on this property, belonging to McKibbin & Snyder, on Yellow Creek. The Bumble Bee adjoins the Wasp ground, in the center of the district producing silicious ore. Near the foot of the hill, fully 400 ft. below the quartzite, the owners run a tunnel about 200 ft. in length in the slates and broke into the free-milling ore recently. It appears to be a true fissure and the ore is high grade. The ledge will be developed by tunnels and crosscuts to determine its extent.

**PIERRE SYNDICATE.**—A report comes from Deadwood that a mining deal was concluded May 24th by the transfer of 35 mining claims and several fractions to this syndicate, composed of a number of Eastern capitalists. The ground is adjacent to Lead City, and is rich, the ore having the same characteristics as the Homestake's ores. It is the intention to erect a 200-stamp mill on Belle Fourche River. The deal involves the expenditure of \$2,500,000.

## TENNESSEE.

**MINERS' STRIKE.**—The miners of the Jellico District, in secret session on May 25th, heard the report of the 16 local assemblies on the proposals of the operators. These are: A 10% reduction on day labor; reduction on cutting entry way from \$2.40 to \$1.75 per linear yard; reduction of 5c. a ton on all coal mined in addition to free handling of cars and other work heretofore done by the companies. The miners claim they have been making a bare living, and that these terms would mean starvation, while

the operators say they are losing money and can do no better. The miners' assemblies have voted to reject the terms and a protracted suspension seems likely, 2,000 men being now idle.

## UTAH.

## (From Our Special Correspondent.)

**NEW MINING LAW.**—On June 10th, under the new mining law, all location notices are to be filed with the county recorder at the county seat and the office of district recorder is abolished. In many of the old districts there is strong opposition to this change from the time-honored custom and in some cases steps are being taken to test its legality. Meetings are being held and funds subscribed for this purpose, while the interest among old miners and prospectors resembles that of a lively presidential campaign.

**SHIPMENTS FROM SALT LAKE CITY.**—During the week ending May 22d there were shipped East 25 cars, or 946,700 lbs. of lead-silver bullion and 37 cars, or 731 tons of lead-silver ore. No copper bullion was sent forward.

## BEAVER COUNTY.

## (From Our Special Correspondent.)

**BEAVER LAKE DISTRICT.**—Signs of rejuvenation are observable on every hand and something effective is to be achieved in this district before the end of the season now opening. Well-directed exploration is to be launched on several properties within the next fortnight. Galena and chloride are to be put into an incorporated company and worked; a 20-day option for a six months' bond has been secured on the June Farnsworth; Copper Mt. is to come back to life; while Beaver Lake and Wasatch companies are preparing for the season's campaign. Greater interest is shown in mining than for several years.

**WASATCH MINING AND MILLING COMPANY.**—This is a corporation but two weeks old, having 150,000 shares of a par value of \$1. The officers and directors are: John H. Whalon, president; Charles Morrison, vice-president; Lorin N. Morrison, treasurer; Richard S. Lipscom, secretary; Edgar C. Hall, all of Salt Lake. The property consists of the Wasatch claim and three mill sites, situated in the Beaver Lake District. Some of the promoters of this undertaking have other nearby interests, and propose to do quite a little work this summer.

## JUAB COUNTY.

## (From Our Special Correspondent.)

**ORIENT MINING COMPANY.**—Bismuth, Maid of Erin, Orient, Orient Nos. 1, 2, 3 and 4 compose a group west of the Scotia in West Tintic, the worth of which is about to be tested. A few weeks ago the company was organized; 150,000 shares, par \$1; officers and directors—O. W. Powers, president; Willis Knapp, vice-president; Joseph Lippman, secretary and treasurer; William L. Morris, D. N. Straup and Patrick Quinn. Perry & Lowe, Salt Lake, are the official brokers. This is silver-lead ground, with the deepest working 70 ft.

**SHIPMENTS.**—For the week ending May 22d the following shipments were made: Bullion-Beck, 15 cars ore, 3 cars concentrates; Centennial-Eureka, 3 cars ore; Eureka Hill, 5 cars concentrates; Uncle Sam, 4 cars ore; Humbug, 2 cars ore; Mammoth, 7 cars concentrates; Carisa, 2 cars ore; Swansea, 1 car ore; Ajax, 2 cars concentrates; South Swansea, 5 cars ore; North Star, 3 cars ore; Dragon Iron, 7 cars hematite.

**TENNESSEE REBEL MINING AND MILLING COMPANY.**—On May 19th this company was incorporated; 150,000 shares, par \$1; head office at Eureka, Utah. The officers and directors are John Adams, president; Jesse Knight, vice-president; William J. Adams, secretary and treasury; George H. Adams, Colin McMurphy and Aurelius Miner. The reality consists of Tennessee Rebel, Bobby Dodder and Coming Summer, west of Opex territory. Exploration is in progress and the shaft is 220 ft. deep.

**TETRO.**—Last week assessment No. 5 of 1c. a share was levied to continue development.

## PIUTE COUNTY.

## (From Our Special Correspondent.)

**BOLITHO-HESS.**—D. W. Davis, of Salt Lake, and Willes Rouff, of Rock Springs, Wyo., have purchased this placer track for \$9,900. A test showed the gravel to carry 56c. per cu. yd.—more than represented. Two hydraulics will shortly be at work.

**CONGRESS.**—Willard Snyder, William Johnson and Thomas Ross are about to sell this claim to William Cummings. Depth is liable to prove Congress a mine. Mr. Snyder evinces his faith in this region by putting all money from sales back into the ground. Last year he realized \$15,000, which he reinvested in other prospects.

**HOLLAND.**—A 70-ft. sluice and 200 ft. of pipe has just been put in. Bedrock is being exposed as paying dirt is washed. Messrs. Snyder & Moore are realizing a profit from the placer.

**NO-YOU-DON'T.**—John Beck has secured a lease and bond on this property and the Great Western, near the Webster mine in Bullion Canon; the price stated is \$70,000. No time is to be lost in testing the work of this ground.

## SAN JUAN COUNTY.

**CALDWELL TUNNEL AND MINING COMPANY.**—This company was recently incorporated with a

capital stock of \$25,000 in 25c. shares. The officers and directors are: William F. Ford, president; M. M. Kaighn, vice-president; W. C. Higgins, treasurer; W. H. Farnsworth, secretary; George E. Johnston. The company owns the Caldwell tunnel and tunnel site, the Ryan, the San Juan and Free Lance mining claims, all in the Blue Mountain District.

## SUMMIT COUNTY.

## (From Our Special Correspondent.)

**CONSTELLATION.**—For a considerable period it has been an open secret that the Ontario and Silver King owners have quietly gathered in additional holdings, due to values in gold. Notwithstanding all this the present uncovering of a strong auriferous zone in Constellation territory is to be chronicled as a momentous happening. At 23 ft. depth the lode is 5 ft. thick, brown oxidized quartz, which widens in sinking. It is an ideal cyaniding product; values range from \$12 to \$22. Strike of ledge is nearly due east and can be traced for 2,000 ft. In all likelihood it is the same ore body encountered in the Silver King. This find is the all-absorbing topic at Park City. It has occasioned the presence of a number of prominent mining men.

**CREOLE.**—Supt. Adam M. Paul states that a seam 2 in. to 2 ft. wide has been struck in the 100-ft. level on Creole No. 1, carrying \$8 to \$15 gold.

**LUCKY BILL MINING COMPANY.**—An assessment of 1½c. is levied. Owing to lack of fuel the mine has been closed for several weeks. The roads now permit hauling and work is to be immediately resumed.

**MARSAC MILL.**—Ore is again being delivered from the Daly mine and the mill will soon be operating, after its two months' idleness.

**TYPHO.**—Grading for a hoist is in progress. The Typo ground lies above the Creole. John Beck recently became interested and exploration is to be actively pushed.

## TOOELE COUNTY.

## (From Our Special Correspondent.)

**BOSTON & MERCUR.**—Twenty cars of construction material recently passed over the Salt Lake & Mercur Railroad for the mill of this company at La Cigale and 15 more are on the road. Quite a settlement is springing up about this mine. Just now it is the center of a very attractive section of Camp Floyd District.

**BUCKHORN.**—Dry Canon, in Ophir District, furnishes a surprise. Recently a cave was opened 400 ft. from daylight, exploitation on one end of which shows a strong vein carrying 8 ft. of pay; the center 4 ft. is crystallized lead carbonates, and 2 ft. on each wall is good grade galena. This development is in virgin ground, and there is reason to believe that the ore chute extends upward 400 ft. to the surface, depth yet to be determined. Superintendent John Nichols was in Salt Lake last week with the first shipment.

**BUCKLIN GOLD MINING COMPANY.**—On May 1st this company was incorporated with 500,000 shares of a par value of \$1, of which 200,000 shares are treasury stock. The officers and directors are: Thomas G. Hill, president; R. C. Chambers, vice-president; John A. Street, treasurer; R. H. McKaig, secretary, and Charles Oakes. The Vanderbilt group on the west dip forms the realty. It is south of Omaha, and joins the Daisy ground on the east, while the La Cigale ore zone crosses Vanderbilt territory for 5,000 ft. Development is being advanced, exposing a mineral body 12 to 18 ft. thick.

**GOLD DUST.**—Recent development has disclosed higher values in mineral than formerly. The directors have considered the advisability of operating the old Marion mill, but just now they are getting figures on a cyaniding plant of their own.

**SACRAMENTO.**—The mill continues winning high percentage of metallic extraction and the grade of ore better than holds its own. Physical condition of mine is excellent.

**SUNSHINE.**—The proposition to lease mine and mill by Joseph Smith and others has fallen through. It is uncertain when operations will be resumed.

## WASHINGTON.

## CLARK COUNTY.

**GOLD COAST MINING COMPANY.**—An important development has been made in the Ella mine, owned by this company, and located in Surprise Valley. The working shaft on the claim was sunk a distance of 42 ft., where a crosscut was run and a vein of ore 6 ft. wide was exposed. Col. James Jackson, D. H. Stearns and others, of Portland, are owners of the property and have a 5-ton mill at work.

## KING COUNTY.

**LEOPATRA.**—A strike has been made in this property, owned principally by James T. Blakistone, Andrew Blakistone and Andrew Henrich, all of Seattle. Originally the outcrop was about 5 ft. in width and was exposed for 300 ft. on the surface. A crosscut was run perpendicular to the depth of 235 ft., encountering 14 in., which assay \$129, and 10 in. assaying \$11.90.

## OKANOGAN COUNTY.

**OPHIR.**—Mr. A. L. Thorpe, superintendent of this mine, in the Methow country, says the shaft is down 40 ft.; a safety hoist and ventilator have been put in, and all the buildings necessary for the work have been erected. Mr. J. J. Sullivan has charge of the mechanical work.

**PALMER MOUNTAIN MINING COMPANY.**—Work on the Palmer mountain tunnel is progressing steadily, having penetrated about 300 ft. The grounds are being cleaned and everything put in readiness to place the new air compressor plant in position when it arrives.

**RED JACKET & LITTLE FALLS.**—These claims, situated about four miles west of Loomis, have recently been bonded to Frank Raborg, of Spokane, with a 10% cash payment. Both claims have well defined ledges, several feet in width of pay ore and from 10 in. to 1 ft. of high-grade ore.

**WHISKY HILL MINING AND TUNNEL COMPANY.**—The contractors on the crosscut at the 80-ft. level on the Mammoth claim, one of the properties of this company, have completed their work, and the ledge shows a width of 40 ft., all in ore, and have not yet secured either wall. The company intends to sink this shaft to the depth of 150 ft. and then crosscut until the walls are reached.

## SKAMANIA COUNTY.

**BLUEBIRD.**—These mines are 18 miles northeast of Washougal. There are now 6 ledges bonded at from \$5,000 to \$30,000 each, 8 leased and others being put in readiness for operation.

**PENN MINING COMPANY.**—This company is driving ahead on the crosscut for the Foggy ledge at Goat Lake. Work on the tunnel is being prosecuted with two drills run by compressed air. The tunnel is in about 300 ft. It will first cut one of the main feeders. The main ledge is parallel with the Mystery ledge of the Monte Cristo district, and has been traced for 2,000 ft.

## STEVENS COUNTY.

**ALICE.**—This claim is 5 miles north of Chewelah. The tunnel, now in about 80 ft., recently struck a slate vein, from which Superintendent Parker says he has received an assay showing \$98.38 in gold per ton. They still have about 50 ft. further to go with the tunnel before striking the main ledge.

**LONE PINE.**—This property is at a new camp known as Eureka, in the Colville Reservation, 185 miles from Spokane. A tunnel 118 ft. long crosscuts several veins of from 2 ft. to 4 ft., but at 102 ft. they struck a ledge 16 ft. wide and 80 ft. below its cropping on the surface. This ledge is fully free milling at that depth, as well as at the apex of the vein.

**PIERE'S LAKE & FLAT CREEK MINING COMPANY.**—Work has been resumed to sink 50 ft. of shaft on each of three of the properties in the group located at Piere's Lake. A vein was reached at a depth of 40 ft. on the Evening claim, consisting of heavy spar mixed with quartz with an occasional sprinkling of free gold. The tests of the surface rock gave \$4.13 gold, 5 oz. silver and 2% copper to the ton. The character of the rock remained the same for the first 30 ft. of depth, but the formation seems to have gradually changed for the better. The Humming Bird, one of the same group, has developed a 15-in vein of bromides of silver, carrying gold and copper.

**RED TOP MOUNTAIN CLAIMS.**—It is reported that Messrs. Laird & Hall have sold to Robert Gibson, of Ontario, Can., and J. J. Voipe, of Ohio, a group of eight claims, on the south side of Red Top Mountain, for \$5,000. Only one year's assessment work has been done on the property, but the showing in both silver, gold and lead is fairly good, assaying as high as 76 oz. in silver and 9 oz. in gold to the ton.

**REPUBLIC.**—On this claim, near the Lone Pine, the shaft is down 20 ft. in solid quartz and the tunnel is in about 60 ft. The quartz crops out here in great masses. A great deal of pay ore is standing above ground on the Lone Pine, the Black Tail, the Pearl, Surprise and the Republic.

**SCOTIA.**—This mine, on Toulou mountain, 6 miles from Bossburg, has struck a pay chute of ore at a depth of 235 ft. in the tunnel. It was found while blasting out a landing preparatory to sinking on the ledge at the terminus of the tunnel. A sack of the ore was taken to Marcus for assay, and, it is said, gave an average value in gold, silver and copper of over \$200.

## WEST VIRGINIA.

## POCAHONTAS COUNTY.

**POCAHONTAS MARBLE COMPANY.**—This company, of Academy, was recently incorporated by W. L. McNeal, George S. McNeal, James B. McNeal, Preston L. Clark, A. R. Smith, A. M. Edgar, E. J. Holb, of Academy; J. W. Marshall and J. T. McGraw, of Mingo.

## WYOMING.

## ALBANY COUNTY.

**LOWER DOUGLAS MINING COMPANY.**—This company has been incorporated for the purpose of carrying on general mining operations, building of railroads, tramway and wagon roads, erecting shops and for other purposes. The capital stock is \$1,000,000, and the principal office will be at Laramie. The trustees are Charles Culross, David McDullaugh, Mortimer M. Grant, Avery T. Holmes, E. F. Duffey.

## FOREIGN MINING NEWS.

## AFRICA.

## GOLD COAST.

**WASSAU GOLD MINING COMPANY.**—The April return of this company shows 448 tons of ore worked, the product being 524 oz. gold, showing an average yield of 1.17 oz. per ton worked.

## BRAZIL.

**ST. JOHN DEL REY GOLD MINING COMPANY.**—This company's return for April shows a total production of 4,496 oz. gold, the average being 0.6 oz. per ton worked. The total output for the four months ending April 30th was 16,945 oz. gold.

## BRITISH COLUMBIA.

## CAMP M'KINNEY.

**CARIBOO MINING AND SMELTING COMPANY.**—This company has declared a dividend of 2% on the capital stock of \$800,000, a total of \$16,000. The last dividend declared was in February, when the total sum divided among the stockholders amounted to \$141,410. The dividend declared yesterday brings the sum total up to \$156,965. The company is now down over 200 ft. with drifts every 50 ft. and there is a ledge of ore over 8 ft.

## NELSON DISTRICT.

**POORMAN.**—This mine has been purchased by Hector McRae and J. Fred Ritchie from A. L. Davenport and Robert Ewart for \$100,000. The Poorman is situated about 7 miles below Nelson on the Kootenay River. It has already yielded over \$100,000 to its owners, and during several years it has been a steady producer. The mine is equipped with a 10-stamp mill, a compressor, hoist and power drills, all operated by water power. There are five other claims included in the group, which consists of the Poorman, White, Hardup, Election and Myomer. The work on the group is confined almost entirely to the Poorman, which has about 1,000 ft. of tunnels, shafts and drifts upon it. A crosscut tunnel is now in 140 ft., which when completed will be over 300 ft. long, and which will tap the ledge at a depth of about 320 ft. The White is the only other claim of the group that has been worked to any extent, and about 500 tons of ore have been taken from the workings, which run a little above the average of the ore from the Poorman. A company is to be organized with a capital of \$250,000, of which \$50,000 will be in the treasury to take over the property. The trustees will be Hector McRae, J. Fred, Ritchie, J. T. Hume, A. L. Davenport and Robert Ewart.

## SLOCAN DISTRICT.

**LEXINGTON MINING COMPANY.**—The sale of the Lexington, Polly and Sunnyside Fraction claims to E. J. and A. W. McCune is reported, for a consideration of \$20,000. The properties will be incorporated at once under the name of the Lexington Mining Company, with a capital of \$1,000,000. The properties purchased are located on Springer Creek, about 2½ miles from Slocan City. They are all on the same lead. Development work on the Lexington disclosed a vein about 4 ft. wide, it is said, containing a streak of highly mineralized ore 8 in. wide. Assays of this, it is claimed, show much silver and \$23 in gold. Development work will be pushed this summer. The control of the Bonanza, I. X. L., Excelsior and Slocan Belle claims have also been purchased by the McCunes. This group is about 2 miles northwest of the Lexington. The I. X. L. lead is 6 ft. wide, from which assays show good silver and gold values. A shaft has been sunk on the vein 15 ft. The Excelsior is on the same lead and the Slocan Belle is an extension of the Morning Star. The Bonanza is a separate vein. The vein is about 3 ft. wide with a rich streak 12 in. wide. The price given is said to be \$25,000. These properties will also be developed this summer.

**MONTEZUMA.**—The final payment on this property, amounting to \$15,000, due August 19, has been paid by C. L. Webb, of Seattle, and his associates. A new crosscut tunnel will be driven about 300 ft. below the present lower workings. When this is completed it will give a vertical depth of 500 ft. from the surface. This will run into the mountain for 500 ft. before the ledge is tapped. Up to the present time there has been about 500 ft. of work done in the two levels. The vein will average 12 ft. in width of concentrating ore. A winze has been sunk on the second level to a depth of 35 ft., which shows up the same grade of ore as above. At present the bottom of the winze is 170 ft. from the surface.

## TRAIL CREEK DISTRICT.

**IRON MASK GOLD MINING COMPANY.**—At the meeting held at Spokane on May 17th the majority decided to give to the minority the board of trustees and management for the ensuing year. The election of officers accordingly resulted as follows: President, Austin Corbin, 2d; vice-president and treasurer, J. P. M. Richards; manager and secretary, James F. Herrick. Also the following board of trustees: Messrs. Peter Larson, A. M. Holter, J. F. Herrick, A. T. Herrick, Austin Corbin, 2d; E. J. Roberts and J. P. M. Richards.

**VIRGINIA GOLD MINING COMPANY.**—At the meeting held in Spokane, Wash., May 17th, the following were elected: Trustees, Patrick Clark, J. A. Finch, B. C. Kingsbury, A. B. Campbell, H. L. Frank, W. J. C. Wakefield, George Todd; president, Patrick Clark; vice-president and treasurer, J. A. Finch; secretary, F. E. Lucas.

"The Virginia claim is between the Iron Mask and Iron Horse, on the east. The vein can be traced the entire length of the claim, 1,500 ft., exposing several ore bodies, but which are, so far as known, too low grade to pay at present. The following is a statement of receipts and disbursements to May 1st, 1897:

Receipts—Assessment No. 1, \$5,000; assessment No. 2, \$9,308.84; total, \$14,308.84. Disbursements—Operating expenses, \$13,040.79; interest, \$106.67 total, \$14,308.84.

(From Our Special Correspondent.)

**COLUMBIA & KOOTENAY.**—This is the property which recently passed into the hands of Mr. Heinze, of the Trail Creek smelter, who is vigorously pushing the work of development. A visit was made to the property, of which Mr. J. W. Astley is the manager. The main tunnel is in 600 ft. At a distance of 400 ft. a winze has been sunk 50 ft., which will shortly be connected with the main shaft just above it. There is a fair quantity of ore in the main shaft and in the winze. Mr. Astley stated that one of the peculiarities so far encountered in the development of this property is the number of local faults or interruptions, but by persistent working the strike of the lead has always been found.

A large dike of porphyrite cuts across the country, and this was encountered and passed, the ore being found beyond. The tunnel shows a considerable quantity of ore exposed in places. The ore, though not of a very high grade, will pay to ship, and a contract has been entered into for hauling it a distance of 1½ miles to the line of the Columbia & Western Railway, whence it will be shipped to the Trail Creek Smelter. At about half way distance in the main tunnel the old company began a prospect tunnel for the purpose of finding a parallel vein which is believed to exist. This will be continued under the present management, as will also the work of sinking the shaft and connecting it with the winze below.

About 300 tons of ore are awaiting shipment at the mine. Much of this has been carefully rated. It can be treated at a profit. The lowest depth reached is about 300 ft. A considerable force of men is at work. The Columbia-Kootenay has already shipped 455 tons this year.

**HALL MINES COMPANY.**—This company's smelter has shut down for two or three weeks for repairs. The furnace is being completely overhauled and rebricked, and the tramway is having two new cables put up in place of the old ones. The new 200-ton blast furnace is nearly finished, and a large amount of custom ore is being contracted for, and a large amount has been received from the War Eagle at Rossland. The new calcining and refining furnaces have been housed, and fires have been started in the former.

**NEW BRUNSWICK CONSOLIDATED.**—This comprises three claims, situated about 1½ miles from the Nelson and Fort Shepherd Railway and two miles from the Elise, in the Wild Horse country. The lead is said to be the same. It is 10 ft. wide, and lies between well-defined walls which are a species of granite called in camp language porphyritic quartz, which contains a considerable quantity of gold. The ore so far found is very much decomposed. At a further depth the ore does not show the same results of exposure, and it is much richer. Some development work has been done, including a 5 x 6-ft. tunnel in 50 ft.

**ROYAL FIRE.**—This company has let a contract to sink a shaft of 50 ft. on the Royal Oak. The present showing of ore is in a part of the claim which possesses good facilities for shipping and other work. The property is about 15 miles due north of Rossland. Development work is being pushed pending the completion of a contract with a London company to assume control of the property at good figures.

**WAR EAGLE CONSOLIDATED MINING COMPANY, LIMITED.**—Through the courtesy of Mr. J. B. Hastings, mining engineer, manager for this company, your correspondent has been permitted to enter the main tunnel of the War Eagle mine for a distance of about 1,200 ft. and note some of the present workings. At a point about 1,000 ft. from the mouth of the tunnel is a shaft 125 ft. deep. Beyond this a distance of about 200 ft., the walls of the tunnel are at least 20 ft. from each other with a great deal of paying ore in sight. A considerable quantity of ore was in course of transit for shipment. The quantity shipped last week was 250 tons, but the policy of the management is to have as large a reserve of ore as possible, the economic conditions with regard to smelting, etc., being yet a question of the future.

There are three distinct tunnels in the War Eagle. The upper tunnel is driven on the vein 750 ft. and it taps this at a depth of 110 ft. The next one is driven on the vein for 1,100 ft. and it taps this at 250 ft. The next one is a crosscut run to tap the Iron Mask and War Eagle mines. It is about 1,050 ft. long and it is driven on this vein for 200 ft. and it will tap the other vein at a depth of 500 ft. About 80 men are employed, and considerable activity was noticeable in the mine. Much work has been done in crosscutting, upraises and winzes. The company is working two other groups of mines—the Richard group, which is an extension of the Slocan Star vein, and the Crown Point, in the South Belt Trail Creek. They have a large reserve fund in the

treasury and the work is now done on scientific principles.

The officers of this company are: George Gooderham, president; T. G. Blackstock, vice-president; J. B. Hastings, mine manager, Rossland; E. J. Kerston, Eastern secretary, Toronto; directors, W. G. Gooderham, A. E. Gooderham, and Dominion Senator Cox. The capital stock of the company is \$2,000,000, par value per share \$1.

#### BRITISH GUIANA.

**BARIMA GOLD MINING COMPANY.**—The April return of this company—the first quartz mining company in the colony—shows 550 tons of ore worked and 367 oz. of gold won, an average of 0.67 oz. per ton.

#### COLOMBIA.

**FRONTINO & BOLIVIA MINING COMPANY.**—The total value of gold obtained from this company's mill in April was \$38,933. The expenses were \$21,559, leaving a profit of \$17,374 for the month.

#### NEW ZEALAND.

**WAIHI GOLD MINING COMPANY.**—This company reports for the four months ending April 30th a total of 13,340 tons of ore taken out and worked. The realized value of the gold bullion obtained was \$213,175, showing an average product of \$15.98 per ton worked.

#### ONTARIO.

##### RAT PORTAGE DISTRICT.

(From Our Special Correspondent.)

**FOLEY.**—This mine is located in the Seine River District, reached in the summer season from Rat Portage by boat via Fort Francis. In the winter the shortest way in is from Tower, Minn. Mr. Foley reached Rat Portage on May 21st from the mine, bringing with him 15 small gold bricks valued at something over \$7,000, the result of 13 days' run of the mill during the latter part of April.

**REGINA.**—Mr. Pringle, the new manager of this property, the second in the district to be put under thorough development, has made several necessary changes in the methods of working it. Latterly, some of the men have been retired as their presence was not conducive to the economic working of the mine. This has given rise to some foolish rumors reflecting upon the ultimate success of the mine. At last report the shaft was down over 260 ft.

**REDUCTION WORKS.**—Work has commenced on the new reduction works which are to be built on the old Dick and Banning Water Power. Mr. Snyder is in charge of the work.

**SULTANA.**—Preparations are being made for the installation of the new machinery which is expected here shortly.

**YUM-YUM.**—Two diamond drills are now working on this mine.

#### QUEENSLAND.

**MOUNT MORGAN GOLD MINING COMPANY.**—For the month of April the return shows 8,265 tons of ore treated, the result being 13,003 oz. gold, an average of 1.55 oz. per ton. For the four months ending April 30th, the total ore treated was 32,671 tons, and the total obtained was 52,299 oz. gold, or 1.60 oz. per ton.

#### SOUTH AFRICA.

##### TRANSVAAL.

**LANGLAAGTE ESTATE.**—In April this company worked 25,014 tons of ore in its mill of 200 stamps. The returns obtained were 8,011 crude oz. gold from the mill, 2,364 oz. from cyaniding tailings and 1,633 oz. from concentrates, a total of 12,008 crude oz., equal to 9,799 fine oz., or 0.39 fine oz., per ton worked.

**ROBINSON GOLD MINING COMPANY.**—In April this company's mill, with 120 stamps, crushed 15,000 tons of ore. The total bullion obtained was, from mill, 10,080 oz.; from tailings cyanided, 3,160 oz.; from slimes and concentrates treated, 5,215 oz.; total, 18,455 oz., equal to 15,060 fine oz. gold, or 1.01 fine oz. per ton treated in the mill.

**TRANSVAAL COAL TRUST.**—This company's collieries shipped in April 19,000 tons of coal, and for the four months ending April 30th, a total of 83,400 tons. The net profit for the four months amounted to \$56,000.

**WITWATERSRAND GOLD OUTPUT.**—The total production of the Witwatersrand mines in April, as reported to the Chamber of Mines, reached 235,698 crude oz., the largest quantity ever reported for a month; exceeding the output for March, 1897, by 3,632 oz., and that for April, 1896, by 58,991 oz. For the four months ending April 30th the return is as follows for five years:

	Crude oz.	Fine oz.	Value.
1893	4,515	346,924	\$7,249,919
1894	635,801	518,814	10,723,855
1895	718,026	585,939	12,110,739
1896	665,855	543,338	11,230,795
1897	888,596	725,094	14,957,693

In this statement the crude bullion reported is taken at the usual average of Witwatersrand gold, 816 fine, and reduced to fine gold at that rate.

#### WESTERN AUSTRALIA.

**GREAT BOULDER PROPRIETARY GOLD MINES.**—This company, owning mines in the East Coolgardie district, reports for the 4 months ending April 30th, a total of 8,506 tons crushed, 20 stamps being at work up to March 1st, and 30 stamps from that date on. The total return was 26,044 oz. gold, giving an average of 3.06 oz. per ton.

## COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 28.

Statement of shipments of anthracite coal (approximated) in tons of 2,240 lbs., for the week ending May 21st, 1897, compared with the corresponding period last year:

	1897.		1896.
	Week.	Year.	Year.
Pennsylvania Railroad.....	58,042	1,313,754	1,395,560
PRODUCTION OF BITUMINOUS COAL in tons of 2,000 lbs. for week ending May 21st, and for years from January 1st, 1897 and 1895:			

	1897.		1896.
	Week.	Year.	Year.
Shipped East and North:			
Allegheny, Pa.....	46,888	907,059	910,851
Barclay, Pa.....	632	15,248	18,867
Beech Creek, Pa.....	69,905	1,431,597	1,262,831
Broad Top, Pa.....	9,127	161,198	6,584
Clearfield, Pa.....	80,371	1,775,208	1,819,796
Cumberland, Md.....	877,315	1,305,786	1,074,172
Kanawha, W. Va.....	1,420,657	1,420,657	1,225,977
Phila. & Erie.....	456	149,950	23,610
Pocahontas Flat Top.....	472,748	874,197	1,466,917
Totals.....	422,826	8,040,890	7,809,589

	1897.		1896.
	Week.	Year.	Year.
Shipped West:			
Monongahela, Pa.....	29,519	506,716	581,258
Pittsburg, Pa.....	32,403	655,975	738,811
Westmoreland, Pa.....	33,540	724,025	795,072
Totals.....	95,292	1,886,716	1,919,141
Grand totals.....	518,118	9,927,606	9,728,730

Production of coke on line of Pennsylvania Railroad for the week ending May 21st, 1897, and year from January 1st, 1897, in tons of 2,000 lbs.: Week, 77,888 tons; year, 1,702,585; to corresponding date in 1896, 1,826,320 tons.

† For week ending May 8th. ‡ For week ending May 14th. § For week ending May 15th.

#### Anthracite.

The hard-coal trade is in rather a stagnant condition this week, as buyers are withholding their orders. Their pretext for so doing is the investigation into the coal trust, so called, which they believe may result in lower prices. On this account the business now is not as good as it was a week ago, so far as volume is concerned, but the prices at this writing are better than they were then. While the figures on the best grades of coal have not wavered in the least for some time, there has been a greater movement of inferior grades recently, at prices not equal to first-grade rates. This is apt to make the average price realized for the month of May fall a trifle below the April figure. For the present buyers are safe in withholding their orders, as it generally understood that no new circular of prices will be issued on June 1st. How much longer the present circular will be in effect is not known, but in all probability not more than another month. Depleted stocks had better be replenished during June, the earlier in the month the better, a fact which some of the larger buyers begin to realize and upon which they will act very shortly. The hopes of some that lower prices will prevail soon, for reasons already stated, will certainly not be realized, especially with an output for June of 2,500,000 tons, which is the tonnage upon which shipments will be made. With prices extremely firm at this time, a very moderate output, and the best harmony among sellers, the temporary scarcity of orders will work no injury to the producing interests.

#### NOTES OF THE WEEK.

A mortgage for \$8,000,000 given by the Lehigh Valley Coal Company to the Girard Life Insurance, Annuity and Trust Company, of Philadelphia, was filed for record May 24th. It bears date of April 30th, 1897. The deed states that the Coal Company, being indebted to the insurance company in the sum of \$5,000,000, and desiring to borrow the further sum of \$3,000,000, has executed a mortgage on all of its property in Schuylkill County, Pa., and its property in South Chicago. The mortgage bears 5% interest, and the entire debt matures May 1st, 1947.

#### Bituminous.

The Eastern soft coal trade is in a quiet condition; orders are sent forward to producers in a limited amount, enough to keep the mines running partly, but none of the operators are pushed in any way to supply the demands on them. The orders to a certain extent come in bunches, which does not admit of an economical handling of the trade to the degree desired. The trade is almost entirely upon contracts taken earlier in the year, transient trade at this time being hardly heard of. Prices remain at a low ebb, and this is causing many of the operators to look for methods for cutting the cost of coal down still further. Some machinery has been introduced for cutting the coal in mines that have hitherto used hand power, and the report from them is quite satisfactory. There are reports of a reduction of wages in some parts of the different regions, though this action is not at all general with the operators. In those cases where miners' wages have been reduced the men seem to have accepted the same, recognizing that it was practically forced by the condition of the trade.

Orders from the territory east of Cape Cod are not in large quantities, consumers seeming content to work along upon the stocks they have on hand to a great extent. Trade to points this side of Cape Cod in the Sound is quieting down a bit, there seeming to have been a quantity of coal sent there sufficient for the present demands of that locality, though the promise is of a later continued demand. New York

harbor trade is quiet, consumers holding off until they are nearly out of coal before ordering for their daily consumption.

All-rail trade is in a fairly active state as regards consumption and requirements. Most of the shipping ports are giving fair dispatch in loading. Transportation from mines to tide is about schedule at this writing. Car supply covers all demands of the operators, though the railroad transportation superintendents watch closely the shipments of individual companies and on any accumulation of cars showing, shut down on the supply promptly. In the coastwise vessel market the supply is slightly better than it was, though not enough to affect rates in any way.

We quote current rates of freight from Philadelphia to Boston, Salem and Portland, 60¢@65¢; Providence, New Bedford and Sound ports, 60¢; Portsmouth, 65¢; Wareham, 75¢; Lynn, 75¢@85¢; Newburyport, 75¢; Dover, 90¢, and towage; Saco, 85¢, and towage; Bath, 65¢; Gardner, 65¢, and towage; Bangor, 65¢@70¢. Five and 10¢ above these rates are asked from Baltimore, Norfolk and Newport News.

#### Buffalo.

May 27.

(From Our Special Correspondent.)

There is but little news to report of occurrences relative to the coal trade of this city. Anthracite remains dull with unchanged quotations. Bituminous moderately active, with prices in buyers' favor, as supply exceeds requirements. So many vessels are laid up that coal for fuel is far below the average consumption. The shipments by lake westward have slightly improved in volume, but at very low rates of freight prevailing there is no money in carrying coal.

Governor Black has signed the bill which provides for the expenditure this fiscal year of \$5,000,000 out of the \$9,000,000 appropriation for the enlargement and improvement of the New York state canals.

The shipments of coal westward by lake from Buffalo for the week ending May 22d inclusive, aggregated 46,225 net tons, distributed as follows: 23,900 tons to Chicago, 75 tons to Alpena, 3,250 tons to Racine, 2,200 tons to Kenosha, 2,300 tons to Duluth, 2,600 tons to Superior and 1,900 tons to Milwaukee. The rates of freight were 35¢ to Saginaw, 25¢ to Green Bay and Racine, 20¢ to Chicago, Milwaukee, Duluth and Superior and 25¢ to Kenosha. Closing steady.

The bids secured by our Board of Public Works for the supply of coal for the public schools and city buildings for the current year were widely apart. Anthracite grate ranged from \$3.99 to \$4.94; egg from \$3.97 to \$4.49; stove, \$3.97 to \$4.37; nut from \$3.87 to \$4.39; and pea from \$2.47 to \$3.24 per net ton delivered at place of consumption. Pocahontas lump and egg was offered at \$3.50 on same terms. Award not announced yet.

#### Chicago.

May 26.

(From Our Special Correspondent.)

**Anthracite.**—Several days of colder weather during the past week, in which fires were a necessity, produced a fair business in anthracite coal, but otherwise trade conditions are poor. Sales made at the present time are almost wholly for small quantities, and there appears no inclination toward any larger or heavier buying in the near future. The circular prices of \$5.35 for grate and \$5.60 for egg are held firmly.

**Bituminous.**—Soft coal continues to be bought in fair quantities by large concerns who are stocking up, this being the season of the year that soft coal has an inning. Out-of-town trade appears to be picking up and dealers are sending in orders for larger quantities of the better grades of soft coal, a result possibly of the increased use of soft coal because of the high price of hard. Inquiry is much better and prospects for future trade brighter.

#### Pittsburg.

May 27.

(From Our Special Correspondent.)

**Coal.**—Most of the coal operators have paid their miners, and no more coal will be mined except small amounts for local purposes until the Monongahela River is made free by the government. The judgment lien of \$200 against dam No. 7 is delaying proceedings to some extent. The Navigation Company will not permit this barrier to stand in the way very long. The operators have all the coal in the South that they need, and when the boats now on their way to New Orleans deliver their tows they will return to Pittsburg. The Cor. Exchange is confident the Monongahela Navigation Company will arrange matters in a few days.

James McCarron, of Philadelphia, was the successful bidder on the construction of six locks and dams to be built on the Monongahela River above Morgantown, W. Va. His bid was \$622,132.

Miners will soon begin their fight for the 69¢ rate. The struggle will probably be commenced in the first week of June. Officials are reticent regarding their plans. The lake trade has opened, but there is little shipping being done, as dealers and operators are holding out for higher prices.

**Connellsville Coke.**—The trade about held its own, in view of the improved condition of the iron trade. A few ovens were blown out at some points, but the loss was more than made up by an increase in the six-day plants. Although the increase was not large, it was certainly encouraging, indicating

that a further improvement may be expected in the near future. The situation beyond the coke region does not look very promising, however. The prices of iron and steel products have not shown the improvement that was expected; to this is added a likelihood of wage difference among iron workers and manufacturers that may result in much loss of time. The week's summary for the region shows 10,512 ovens in blast with 7,865 idle, about the same as the week previous. The 20 ovens completed at the Humphrey plant of the Bessemer Coke Company have been fired up and made full six days last week. The production of the region for the week amounted to 102,799 tons, an increase of 50 tons. The week's shipments from the region amounted to 6,342 cars against 6,321 cars the week previous, increase 21 cars; distributed: To Pittsburgh, 2,715 cars; points West, 2,380 cars; shipped East, 1,247 cars. Prices nominal.

Shanghai, China. April 23.

(Special Report of Wheelock & Co.)

**Coal.**—Since last writing our market for Japan coal has improved considerably, and as rates of freight have greatly advanced, holders of the small quantity in stock are so firm that a very small business has resulted, and we venture to say that a further advance may be anticipated, as stocks both in Moji and Nagasaki are very small and tonnage limited. Cardiff has been in demand, but as first hands are at present asking almost prohibitive prices, very little business has been done. We omitted to note the arrival on April 2d of 1,900 tons, and we now have to report an arrival in April 13th of 1,100 tons, all transhipped in Hongkong and sold in this market at prices which are private. We make this article firm at 15.50 taels per ton. Stocks of Australian Wollongong are now in the hands of the native dealer, but as they are still very large there is little prospect of being able to do forward business; prices remain firm, and small transactions are taking place daily at 8.65 taels per ton.

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 5.25@5.75 taels per ton firm, with an upward tendency, for other sorts.

**Kerosene Oil.**—Business has been very brisk during the last two weeks, large transactions having taken place, chiefly among the native dealers, and rates have varied considerably. At the beginning of the period the market ruled very strong, Devoe's reaching as high as 1.75 taels per case, but on the arrival of an August sailer, on which underwriters had about decided to settle claims, prices experienced a severe drop. Devoe's selling at 1.66½@1.67 taels. Owing to the very large deliveries, 1.67½ taels may be considered the closing quotations. Russian has also had considerable attention at 1.60 taels per case and 1.50 taels for bulk, with further inquiries at these figures. Settlements have been made for cargo to arrive at 1.56 taels per case. There being no stock of Langkat, our quotation is nominal. Arrivals have been 164,386 cases Devoe's. Stocks, including all arrivals, are now 288,000 cases Devoe's and 137,500 cases Russian. No Langkat in stock. Quotations are as follows per case: American Devoe's, 1.67½ taels; Russian Batoum, 1.60 taels; Russian Batoum, bulk, 1.50 taels; Langkat, no stock.

IRON MARKET REVIEW.

NEW YORK, Friday Evening, May 28, 1897.

Pig Iron Production and Furnaces in Blast.

Fuel used.	Week ending		From		From	
	May 20, 1896.	May 28, 1897.	Jan., '96.	Jan., '97.	Jan., '96.	Jan., '97.
Anthracite.	42	21,910	26	15,600	626,238	380,886
Coke.....	188	172,480	108	151,500	3,657,799	3,073,814
Charcoal....	15	5,230	14	3,850	111,760	112,288
Totals....	195	199,620	148	170,950	4,395,797	3,566,986

No material improvement is to be noted in the iron market, and the only report that can be made is that demand, both for raw iron and steel and for finished products, continues irregular. Prices remain low, and there seems no chance of an improvement, while all sorts of offers are made to secure buyers. In fact hardly any large order is secured without making some concessions. The worst point is that even this does not seem to induce buyers to come out freely. It hardly seems possible to go lower, and indeed current prices can leave no profit for anyone except those large concerns which are able to work down to the lowest limit of costs, and they cannot have such a very large balance on the profit side of the account book.

Some people are talking about an early increase in demand for iron and steel, but it is not easy to say where it will come from. There is nothing at present to warrant such an expectation. Talk also continues about reorganizing the rail and steel billet pools; but it is limited to a small number, and the large companies do not take any notice of the rumors. The present hardly seems a good time to make new arrangements, or to form any new trust or combination.

The report of the Southern Pig Iron Committee for April, issued on Saturday, shows that shipments of iron for April from Alabama and Tennessee were larger than during any previous month this year, the total being 106,701 tons, of which 101,042 tons

were pig iron and 5,700 tons cast pipe. Of this 32,838 tons of pig were exported.

Negotiations about the armor plate difficulty are pending between the Navy Department and the manufacturers. It is thought that the necessary action as to price limit can be secured from Congress.

New York. May 28.

Locally the iron trade is somewhat better than last week, and some sales agents look forward to a stiffening in prices. In bridge work, we understand a contract was recently let to the Owego Bridge Company for the Humiston structure at Rome, N. Y. The lowest bid for furnishing a steel superstructure for Weybosset bridge over the Providence River, R. I., was \$27,630, by the Boston Bridge Works. The Exeter, N. H., steel bridge, which is to take the place of the old wooden Great Bridge, will be built by the Boston Bridge Works. A few contracts were let for plates, and among them is one from the Standard Oil Company to the Pottstown Iron and Steel Company. The Recreation Pier at Twenty-fourth street and East River, N. Y., is bid for by local concerns, and the contract will be awarded on June 5th.

In cast-iron pipe we note that the Jackson & Woodin Manufacturing Company received a contract from Syracuse, N. Y., for 1,200 gross tons of pipe (4 to 16 in.) and 50 tons of specials, the prices being from \$16.55 to \$17.55. The Champlain, N. Y., contract for about 400 tons is believed to have gone to the South Pittsburg Pipe Works, and they and the Utica Pipe Works were the lowest bidders.

In structural material contracts were awarded for 1,800 tons of material for No. 7 to 11 Murray street, 1,500 tons for the Cheeseborough Building, 1,500 tons for the Gillet Building at Nineteenth street and Broadway, 1,500 tons for the buildings of the Metropolitan Traction Company and 350 tons for the Ruptured and Crippled Children's Hospital.

Export trade continues unchanged, and although many inquiries are being received for raw and manufactured iron and steel, orders are small.

**Pig Iron.**—Consumers are still holding off, and only a few are buying to meet immediate wants. Most of the deliveries made by furnacemen to the East within the last week or so were on old contracts. One large interest informs us that its orders recently aggregated 4,000 tons, and only two lots of this were for 1,000 and 2,000 tons; the remainder was made up by small purchases. We do not hear of much cutting among sales-agents, but there are some who continue to shade prices.

Quotations are: 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, \$9.75@10; 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.**—A few contracts were closed recently as noted above.

**Spiegeleisen and Ferro-Manganese.**—The trade locally continues quiet, but there has been some ferro-manganese exported this week. Prices are: For spiegeleisen, 20%, \$19@19.50 per ton; ferro-manganese, 80%, domestic, \$45, delivered at buyer's mill.

**Steel Billets.**—Business locally is quiet, and mill prices stand at about \$15.50@16.

**Merchant Iron and Steel.**—The trade continues quiet. Prices are weak. Common bars, 1@1.05c.; refined, 1.10@1.20c.; 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.**—Business continues to be fairly good. 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, 1.25@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.**—Several contracts have been closed this week. We quote for angles, 1.10@1.15c.; tees, 1.35@1.50c.; channels, 1.70@1.80c. 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.**—Business is not active, and prices are unchanged. We quote: Standard section steel rails, \$18@20 at mill, and girder rails \$23.

Quotations for rail fastenings are: Angle bars, 1.05@1.10c.; spikes, 1.50@1.60c.; bolts, 1.75@1.85c. for square nuts and 1.80@1.85c. for hexagon nuts. These prices are for carload lots.

**Wrought-Iron Pipe.**—Business is fair, 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, 57, 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.**—Business in wire nails has been stimulated somewhat by the rumored formation of a rod pool.

Quotations are \$1.50@1.60 per keg at New York. Cut nails are not active, and in view of shading of prices by some Eastern manufacturers the market is irregular. About \$1.20 per keg at mill is a fair quotation.

**Old Material.**—The domestic market is slightly better; orders were principally for small lots, and prices continue fair. Export trade is quiet, and prices tend to a lower level. Of the sales made this week we note 700 tons of railroad scrap; 125 tons of old steel girder rails at \$10 per ton, f. o. b. cars, Jersey City, and 1,000 tons standard steel tees at \$10.50 per ton for export. Quotations are as follows: Old iron tee rails, \$10.50@12 per ton; old steel rails, \$10@11; No. 1 wrought scrap iron, \$11.50@12.50; good machinery scrap, \$9@10, all f. o. b. cars; wrought pipe and tubes, \$7.50@8 per ton; car wheels, delivered at buyer's works, \$10@10.50; burnt iron, \$9@9.50; cast borings, \$7@7.50 per ton delivered at mill.

Buffalo. May 26.

(Special Report of Rogers, Brown & Co.)

We note a slight improvement in the demand and an increased call for deliveries on time contracts, although business still runs more to carload orders for quick delivery than for larger amounts. Prices remain unchanged at the lowest level ever known in this market. Some efforts to break them still lower by offers on good-sized lots failed to succeed, the furnaces interested refusing to sell. On the whole, the situation with both consumers and producers appears to be better and brighter, but the improvement is so light as to do little more than encourage. Our prices below are on the cash basis f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$10.75; No. 2 strong foundry coke iron, Lake Superior ore, \$10.50; Ohio strong softener No. 1, \$10.75; Ohio strong softener No. 2, \$10.50; Jackson County silvery No. 1, \$14; Southern soft No. 1, \$10.75; Southern soft No. 2, \$10.50; Niagara malleable \$11.25.

Chicago. May 26.

(From Our Special Correspondent.)

**Pig Iron.**—Sales of pig iron have been more numerous and inquiry has been larger. A number of sales of 1,000 to 5,000 tons have been made, and a good aggregate of sales of the carload and 100-ton kind. Northern and Southern furnaces showed business nearly evenly divided; the recent reduction in Southern freight rates and a corresponding reduction in price of Northern iron seemingly had great weight with the consumer. Prices are firm 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, \$9.50@9.75; Southern silveries, \$10.25@10.50; Jackson County silveries, \$13@15; Ohio strong softeners, \$12@12.25; Alabama car wheel, \$15.50@16; Coke Bessemer, \$11.50@12.

**Bar Iron.**—Inquiry did not develop as expected, and therefore the week's business was not very large. Quotations are for common iron 1@1.10c.

**Steel Rails.**—Heavy sections of rails remain in poor demand, while the sales of the lighter sections continue to run up to a very good total. Rails are quoted \$21@23 according to specification.

**Billets and Rods.**—Rods have been in better demand, some very good sales having been made. Billets have not improved, and are quoted \$16.50.

Cleveland. May 26.

(From Our Special Correspondent.)

**Iron Ore.**—While the market has been quite active, the sales of ore during the past week have been comparatively small in volume, and even the sum total would not figure up a large amount. It is estimated that so far this season about 5,000,000 tons of ore have been placed, which, on the basis of last year's business, is half a season's transactions. The announcement has been made that while the small furnace-owners have been waiting for a resumption of business Andrew Carnegie has secured contracts which will make him a consumer of 5,000,000 tons of ore during the year and that his plants, which have recently been enlarged, will be operated to their full capacity until all the contracts are filled. The following are the prices for ores: 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.

Lake freight rates have suffered somewhat during the last week. John D. Rockefeller had chartered 12 steamers to carry 1,500,000 tons from the head of the lakes, but on Monday he canceled the contracts on account of a complication in an ore deal. This has had the effect of placing additional tonnage on the market. Single trip charters are being made at 60c. from the head of the lakes, 50c. from Marquette and 40c. from Escanaba.

**Pig Iron.**—Quite decided reductions will be noted in the quotations this week. Bessemer has dropped from 25 to 50c. a ton, and the prices on almost all the other varieties have been shaded considerably. The sales have been chiefly of foundry iron. Following are the quotations: Lake Superior charcoal, \$13.25; Bessemer, \$9.75@10; No. 1 Foundry, \$10.50

@\$10.75; No. 2, \$10.00@\$10.25; No 1 Ohio Scotch, \$10.65; No. 2, \$10.15; gray forge, \$8.75@\$9.

**Philadelphia.**

May 28. (From Our Special Correspondent.)

**Pig Iron.**—There is a stronger undercurrent to the crude iron trade than there has been for weeks. The actual transactions in pig iron are not so large or numerous, but the tone of the market is much better. In iron offices there is a growing faith in an early adjustment of the tariff question, and this is having considerable weight. There is no pressure to sell the better brands and there is less heard of Southern iron. More buying, especially of foundry irons, is being done, but even in these makers do not care to make long running contracts. There is no money in iron at present prices, and the idea is expressed that it will be better to sell slowly and see which way the market drifts. No. 1 X foundry is hanging around \$12 and No. 2 near \$11; forge is to be had at \$9.50@\$10.50. The mills are not doing much yet, and forge is hard to move.

**Billets.**—The market price is about \$16, and users are talking about business. Parties representing makers are less urgent in selling, for two reasons, there is nothing much in billets now, and better prices, they say, are bound to come as soon as the market rights itself.

**Merchant Bars.**—Merchant bars are dull because the big consumers have not begun work. The best news we can get from car builders is that they expect a good deal of business sometime. When that will be is hard to say. Refined iron is sluggish at a narrow margin above cost.

**Skelp.**—The mill owners would allow buyers to about make their own prices. We hear of no important business.

**Sheet.**—In a retail way business is improving at both mills and stores. In a wholesale way there is no improvement, but there were some inquiries last week which has led to correspondence that may mean some considerable work for the mills.

**Merchant Steel.**—A few buyers are pricing standard steel for various purposes.

**Pipes and Tubes.**—Pipe work comes in slowly, but two or three tube mills are reported among the brokers to have fallen into good-sized orders. Nothing can be learned about prices.

**Nails.**—The market is slow.

**Plate and Tank.**—Quite a run of small orders was secured during the past few days for small jobs, including orders for boiler-plate, for gasholders and to complete some small jobs on bridge work.

**Structural Material.**—From certain signs there is likely to be a big order or two on the market, but the competition will be sharp. We hear of and see considerable work. Prices continue very low, and certain railroad officials are recommending the placing of orders now.

**Steel Rails.**—There is no news to give.

**Old Rails.**—Iron rails are now offered at some points in the South by way of exchange but they are not likely to be put on the open market.

**Scrap.**—The scrap dealers claim to see daylight in their business. Considerable stuff of one sort or another has been sold within a few days—but there is no change in quoted prices.

**Pittsburg.**

May 27. (From Our Special Correspondent.)

**Raw Iron and Steel.**—Business since our last continues to improve slowly. The volume of transactions shows up fairly well, and consumers appear to have made up their minds that purchases cannot be much longer delayed with safety. Stocks in the hands of consumers are said to be limited and will soon require replenishing. Bessemer pig in the Valley is very much firmer, furnacemen are asking an advance and are not disposed to listen to concessions. Sales the past two weeks reach 60,000 tons. There seems to be trouble ahead after July 1st in regard to puddling, the Association having fixed the price at \$4.50 a ton for the coming year, while the Valley mills are a unit in declaring that \$4 is the limit they will pay. The immense amount of iron piled up will enable the mills to stand a shut-down for a long time; in the meantime they will be able to close out their accumulated stocks at better prices than now prevail. There seems to be still a disposition on the part of certain consumers to purchase very sparingly, while others who hold a different opinion are disposed to take hold more liberally; sellers seem to be mixed in their ideas, some being willing to meet the market within moderate limits, while others do not care to take orders at prices now ruling.

In manufactured iron and steel the market has not as yet quieted down from the disturbing effect of the collapse of the beam combination. Prices are about 1/2c. per lb. below the outside figures a few weeks ago. Notwithstanding the general condition of trade, it is believed that the next four weeks will witness considerable new business in various branches of trade. Some of the mills are now working on orders taken at prices ruling when the trust went to pieces some time ago. In other branches of finished iron and steel conditions remain without any special change.

For steel billets, the market was firmer, with a limited demand, the sales reported being generally at an advance.

In wire nails the demand is considerably below expectations; prices are weak and uncertain, with sales reported \$1.25@\$1.30.

For steel rails the market is quiet and prices unchanged.

The American Tube Works, of Pittsburg, with plants at Youngstown and Middletown, Pa., has just closed contracts for 25 to 30 miles of 10-in. wrought iron line pipe, for delivery in the Indian gas fields. This, together with contracts secured in April, for 50 miles of large sizes of wrought iron pipe, will keep both mills operating for some time.

**Latest.**—Business continues to move along steadily. For certain products there was a fair inquiry while again others were neglected. Sheet bars declined with liberal sales; skelp steel showed a further decline; steel wire rods were \$1 a ton below previous rates; Bessemer pig was held firmly without change of figures; steel billets are held firmly at a slight advance on previous transactions; mill iron is dull, there being no demand, and prices are uncertain. Taken as a whole, the general outlook is more favorable.

COKE, SMELTED, LAKE AND NATIVE ORE.		Tons.	Cash.
1,000 Bill, M., J., Pitts.	14.00		
1,000 Bill, M., J., Pitts.	14.30		
800 Bill, May, Pitts.	14.50		
600 Bill, May, Pitts.	14.40		
SCRAP IRON AND OLD RAILS.			
500 Steel R., gross, P.	\$9.25		
100 Steel R., gross, P.	9.00		
100 No 1 Wr't, scrap, gr., Pitts.	11.50		
100 Cast Scrap, gross, Pitts.	8.50		
100 Wr't Bor'ge, gross, Pitts.	6.00		
100 Wrought Turnings, gross, Pitts.	7.00		
MUCK BAR.			
500 Neu., Pitts.	\$18.50		
STEEL WIRE RODS.			
1,500 June, Pitts.	\$20.00		
SKELP IRON.			
800 W. G., Pitts.	\$1.05 4 m.		
750 N. G., Pitts.	1.05 4 m.		
500 Sheared, Pitts.	1.20 4 m.		
SKELP STEEL.			
3,000 N. G., Pitts.	\$0.85 4 m.		
750 Sheared, Pitts.	1.00 4 m.		
700 W. G., Pitts.	0.85 4 m.		
BLOOMS, BILLETS, BAR ENDS.			
575 Billet ends, Pitts.	\$9.60		
SHEET BARS.			
3,800 Del., Pitts.	\$16.85		
1,000 J., J., A., Pitts.	16.70		

**Cartagena, Spain.** April 30. (Special Report of Barrington & Holt.)

**Iron and Manganiferous Ores.**—Some outside merchants, who on the revival of the ore business last year took to buying and shipping these ores, have to a great extent dropped this trade. There is still keen competition for good merchantable ores of all classes, many mines being worked night and day. Shipments during April have been 10 cargoes of manganiferous ores, eight of dry ore, and two of 60% magnetic ore, making a total of 20 cargoes as against 26 during March and 40 in February.

We quote for ordinary 50% Portman ore, 5s. 8d. per ton; special low phosphorus, 5s. 11d. @ 6s. 4d. Cartagena 50% ore, 6s. 2d. per ton; special low phosphorus, 6s. 4d.; extra quality low phosphorus, 6s. 8d.; special iron ore, 7s. 2d.; specular iron ore, 9s. 3d., and magnetic ore, containing 60% iron, 10s. 9d. per ton. For manganiferous ores we quote: No. 1, 20% iron and 20% manganese, 15s. 8d. per ton; No. 1 B, 25% iron and 17% manganese, 12s. 6d.; No. 2, 30% iron and 15% manganese, 11s. 4d.; No. 3, 35% iron and 13% manganese, 10s. 2d.; No. 4, 38% iron and 10% manganese, 9s. 2d. per ton.

**Other Ores.**—Shipments in April were: 75 tons of copper ore, 150 tons of iron pyrites, 25 tons of galena to Marseilles, and 300 tons of blende to London. In addition to these there were shipments of 25 tons of copper scrap to Marseilles, and 336 kilos of quicksilver to London.

**METAL MARKET.**

NEW YORK, Friday Evening, May 28, 1897.

**Gold and Silver.**

**Prices of Silver per Ounce Troy.**

May.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.	May.	St. Ex.	London Pence.	N. Y. Cts.	Value of sil. in \$.
22	4.87 1/4	27 5/8	60 1/2	.466	26	4.87	27 5/8	60	.464
24	4.87 1/4	27 5/8	60 3/8	.465	27	4.87	27 5/8	60	.464
25	4.87 1/4	27 5/8	59 5/8	.463	28	4.86 3/4	27 5/8	60 1/2	.465

The decline of silver to 60c. per oz. has been followed by less pressure to sell, and, therefore, the market, which looked weak at this figure, has steadied itself and under a moderate demand has improved to 27 1/2d., or 60 1/2c. At this price there is an inquiry for June and July deliveries.

The United States Assay Office in New York re-

ports the total receipts of silver at 35,000 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	64.79	30.69	67.13	27.36	59.69
February	29.68	64.67	31.01	67.67	27.47	59.90
March	28.96	63.06	31.34	68.40	28.33	61.98
April	28.26	61.85	31.10	67.92	30.39	66.61
May	.....	.....	31.08	67.88	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	67.42
December	.....	.....	29.70	65.24	31.40	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, April, 1897, and years from January 1st, 1897 and 1896:

	Coin and bullion.		In ores.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
<b>GOLD</b>					
April	\$6,629,419	\$619,452	\$1,800	\$319,604	E. \$5,662,163
1897..	7,910,128	2,504,339	91,793	1,390,556	E. 4,106,431
1896..	16,916,572	23,747,264	80,319	453,022	E. 7,203,395
<b>SILV.</b>					
April	4,893,595	578,124	250	1,694,104	E. 2,714,917
1897..	18,470,635	2,698,303	246,950	6,586,388	E. 9,432,954
1896..	20,420,322	4,391,752	554,102	5,513,136	E. 11,039,543

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 May 28th, 1897, and for years from January 1st, 1897, 1896, 1895, 1894:

Week	Gold.		Silver.		Total Excess, Exp. or Imp.
	Exports.	Imports.	Exports.	Imports.	
We'k	\$2,850,000	\$11,235	\$88,523	\$175,954	E. \$3,471,324
1897..	10,020,847	1,513,021	16,700,661	1,072,639	E. 24,185,792
1896..	26,452,216	16,871,908	15,478,221	855,511	E. 24,202,988
1895..	32,509,122	19,743,040	13,547,201	591,144	E. 25,722,139
1894..	45,183,349	9,163,118	16,804,281	691,400	E. 52,127,062

The gold exported for the week went to Germany; the silver to London and Spain. The gold and silver imported came chiefly from Central and South America.

**FINANCIAL NOTES OF THE WEEK.**

The conditions of business have not changed materially during the week now closing. Trade continues to hesitate and no improvement is manifest. The tariff bill is now before the Senate, but no one can say how soon any real advance will be made, while the Cuban question is still threatening. Altogether, the outlook is a doubtful one, and the summer promises to be a dull one so far as business is concerned.

Gold shipments this week began on a considerable scale. A total of \$2,850,000 was sent on Tuesday and Wednesday. There has, however, been no gold taken for Saturday's steamers, so that the figures given is the total for the week.

The Bank of England has dropped its official discount rate from 2 1/2% to 2%, going back to the point from which it started up several months ago. The change was hardly expected, but attracted little notice.

Imports of specie at San Francisco by water for April and for the first four months of the year were as follows:

	Gold.	Silver.	Total.
Coin	\$46,208	\$46,041	\$92,249
Bullion	272,259	545,310	817,569
Total	\$318,467	\$591,351	\$909,818
Total, 1896	.....	.....	\$967,408

Of the total this year \$809,594 came from Mexico, \$67,930 from British Columbia and \$32,294 from other countries. A considerable amount of silver dollars came from Mexico by rail not included in the above total.

The statement of the United States Treasury on Thursday, May 27th, shows balances in excess of outstanding certificates as below, comparison being made with the statement for the corresponding date last week:

	May 20.	May 27.	Changes.
Gold	\$145,729,820	\$144,100,650	D. \$1,629,170
Silver	23,333,474	24,636,320	I. 1,302,846
Legal tenders	32,555,269	32,608,801	I. 55,532
Treasury notes, etc.	27,143,933	28,085,999	I. 942,066
Totals	\$228,762,496	\$229,431,720	I. \$669,224

Treasury deposits with national banks amounted to \$16,855,078, a decrease of \$385,143 during the week.

The statement of the New York banks—including the 66 banks represented in the Clearing House—for the week ending May 22d, gives the following totals, comparisons being made with the corresponding weeks in 1896 and 1895:

	1895.	1896.	1897.
Loans and discounts	\$500,038,700	\$473,400,400	\$504,952,300
Deposits	561,993,400	497,031,200	572,141,400
Circulation	13,321,400	11,529,800	11,405,800
Reserve:			
Specie	69,534,400	61,541,500	88,295,500
Legal tenders	110,866,600	84,420,300	100,736,300
Total reserve	\$180,451,000	\$145,961,800	\$189,031,800
Legal requirement	140,475,850	124,260,300	143,032,850
Surplus reserve	\$39,975,150	\$21,701,500	\$45,998,950

Changes for the week this year were increases of \$163,300 in specie; \$1,324,500 in legal tenders, and \$1,508,450 in surplus reserve; decreases of \$998,810 in loans and discounts; \$81,400 in deposits, and \$78,300 in circulation.

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. Asso.	\$61,541,500	.....	\$88,295,500	.....
England	239,127,715	.....	182,658,695	.....
France	598,337,168	\$250,053,505	392,362,400	\$245,818,800
German	231,450,000	.....	232,290,000	.....
Austro-Hun.	136,850,000	64,071,000	168,490,000	63,119,000
Netherlands	13,179,000	34,710,000	13,151,000	34,658,000
Belgian	19,973,000	.....	20,397,000	.....
Spain	42,628,000	.....	43,245,000	.....
Italy	62,615,000	10,495,000	60,710,000	11,750,000
Russia	427,890,000	.....	463,925,000	.....

The return for the Associated Banks of New York is of date May 22d; all the others are of May 27th, except the Bank of Italy, April 20th, and the Bank of Russia, April 16-28th. 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 May 6th are reported by Messrs. Pixley & Abell's circular as below:

	1896.	1897.	Changes.
India	£1,672,298	£1,938,350	I. £266,052
China	427,450	44,512	D. 382,938
The Straits	282,882	57,093	D. 225,789
Totals	£2,382,630	£2,039,955	D. £342,675

Arrivals for the week this year were £176,000 in bar silver from New York, and £73,000 from Chile, a total of £249,000. Shipments for the week were £53,500 in bar silver, and went to Bombay.

Indian Exchange continues to fall, and the India Council has given up its attempt to fix the rate at 15d. Sales of Council bills in London amounted to 42 lakhs, at an average rate of 14.50d. per rupee. The India Council has invited bids for a new gold loan of £2,500,000, which will bear 2½% interest; the minimum price is fixed at 95.

The foreign merchandise trade of Great Britain for the four months ending April 30th is given by the Board of Trade returns as below:

	1896.	1897.
Exports	£148,126,142	£132,964,781
Imports	100,168,597	100,956,466
Excess, exports	£47,957,545	£32,008,315

There was a gain of 3·2% in imports and of 0·8% in exports as compared with last year. The gold and silver movement for the four months is reported as follows:

	Imports.	Exports.	Excess.
1896	£9,121,305	£7,278,683	Im. £1,842,622
1897	5,557,263	7,650,652	Im. 1,906,611

SILVER: 1896. 4,824,777 4,759,519 Im. 72,258 1897. 5,328,869 4,548,603 Im. 780,266 Imports of gold from the United States this year were £37,917, against £3,077,542 last year.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	\$ .47½	\$ .49
Peruvian soles and Chilean pesos	.43	.45
Victoria sovereigns	4.87	4.90
Twenty francs	3.86	3.90
Twenty marks	4.75	4.80
Spanish 25 pesetas	4.78	4.85

Other Metals.

Copper.—The market, though quiet, remains very firm, the recent advance being well maintained. Domestic manufacturers are doing little in the way of placing new orders, but the demand

from abroad continues on a scale sufficiently large to absorb what surplus there is. We quote Lake copper 11c. @ 11¼c., electrolytic copper in cakes, wirebars or ingots 10¾ @ 10½c., electrolytic copper in cathodes, 10½ @ 10¼c. and casting copper 10¼c.

The foreign market, which opened early in the week at £48 12s. 6d., gradually advanced to £49 for spot and £49 7s. 6d. for three months prompt, which are the closing figures. Consumption abroad continues on a marvelous scale, and there are as yet no indications of a falling off. We quote for refined and manufactured: English tough, £51 10s. @ £52; best selected, £51 15s. @ £52 5s.; strong sheets, £59; India sheets, £56 @ £57; yellow metal, 5d.

Imports of copper into Great Britain for the four months ending April 30th included 12,514 tons copper ore, 32,942 tons matte and precipitate, and 17,791 tons fine copper; the whole equal to about 35,500 tons fine copper. Of this there came from the United States 593 tons ore, 7,364 tons matte, and 8,706 tons fine copper.

It has ruled steady at prices unchanged from those of last week, both spot and futures being quoted 13·55c.

The fluctuations in the foreign market have ruled within the narrow limit of 5s. The market at the beginning of the week opened at £61 5s. for spot, and closes to-day at £61 10s. spot, and £61 17s. 6d. three months prompt. The statistical position of the article seems to have improved a little, but prices have not benefited thereby, on account of the values for silver, which at one time this week were lower than for several years past.

Lead.—The transactions early in the week were large, but prices are again somewhat lower, and the market must now be quoted 3·22½c., New York, at which figures sellers seem to be abundant. The offerings have of late been very plentiful and the demand very unsatisfactory, especially so far as the East is concerned. Business in lead products is not at all brisk, while supplies of the raw material appear to be on the increase.

The market abroad is firm at £11 18s. 9d. for Spanish and 5s. higher for English, the reports received being to the effect that supplies continue on a limited scale and barely sufficient to meet the demand. Under the circumstances the higher quotations established on the other side will most likely be maintained.

The movement of foreign lead during the first quarter of the year, as compiled by the New York Metal Exchange, shows imports as follows: Mexico, 15,088 long tons; Canada, 2,695 tons; other countries, 197 tons; total, 17,982 long tons. The exports of lead in bond were 12,236 tons, and the decrease in bonded warehouse stocks was 2,065 tons, indicating that 7,811 tons had been entered for consumption.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: The market during the week was quiet but firm, with sales of soft Missouri at 3·07½c., and desilverized at 3·10c.; future sales are at 2½c. @ 5c. per hundred higher. Prices are somewhat firmer at the close.

Imports and Exports of Metals.

Port.	Week, May 27.		Year, 1897.	
	Expts.	Impts.	Expts.	Impts.
<b>*New York.</b>				
Aluminum, boxes	270	.....	1,552	.....
Antimony ore, short tons	.....	.....	.....	463
regulus, casks	.....	.....	.....	183
B-ass, old, short tons	.....	.....	.....	231
Copper, fine, long tons	1,834	83	27,762	1,803
matte	98	.....	4,314	111
sulphate " " "	86	.....	4,340	.....
Ferro-mangan'se " " "	150	.....	882	52
Iron, pig, bar, rod " " "	.....	.....	4,805	1,419
pyrites " " "	.....	.....	.....	5,570
Lead bullion " " "	1,332	1,177	14,450	19,160
Manganese ore " " "	.....	.....	.....	3,157
Nickel " " "	102	.....	478	10
Spiegeleisen " " "	.....	.....	9,123	14,357
Steel, billets, rods " " "	605	398	11,435	8,905
Tin " " "	26	212	935	914
" dross " " "	9	.....	37	.....
" and black plates, boxes	.....	23,292	.....	349,060
Zinc " " long tons	.....	.....	1,585	1,089
" dross " " "	19	.....	2·7	.....
<b>†Balt more.</b>				
Chrome ore, long tons	.....	2,070	.....	5,511
Copper, fine, " " "	9·5	.....	15,098	.....
sulphate " " "	.....	.....	1,423	.....
Ferro-manganese " " "	241	.....	2,418	25
Ferro silicon " " "	.....	21	.....	69
Iron ore " " "	.....	6,692	.....	117,585
pig, bar, etc. " " "	.....	345	.....	1,631
Lead " " "	.....	120	.....	300
Manganese " " "	.....	496	.....	4,759
Spiegeleisen " " "	.....	75	.....	680
Steel " " "	.....	.....	2,719	221
Tin wire, bundles long tons	472	.....	1,377	5,634
" and black plates, boxes	.....	.....	624	.....
Zinc " " long tons	.....	.....	1,275	18,407
" dross " " "	.....	.....	46	.....
<b>**Philadelphia.</b>				
Antimony " " casks	.....	.....	.....	2,707
Copper ore, long tons	.....	.....	.....	15,009
Ferro-manganese " " "	.....	.....	.....	48
Iron ore " " "	.....	6,241	.....	92,777
Manganese ore " " "	.....	4,250	.....	43,205
Tin " " "	.....	.....	.....	293
" and black plates, boxes	.....	.....	.....	3,961

\*New York Metal Exchange returns. †From our Special Correspondent. \*\*Week ending May 21. \$Week, May 20.

Imports of lead into the United Kingdom for the four months ending April 30th amounted to 56,107 long tons, showing a decrease of 1,117 tons, or 1·9%, as compared with last year.

Spelter is very firm; the price is well maintained at 4@4·05c. St. Louis, and 4·30@4·25c. at New York. The European market is somewhat lower, the quotation being cabled as £17 1s. 3d. for ordinaries and £17 3s. 9d. for special brands.

Exports from the United States in April included 86 tons of zinc ore and 2,060 long tons of spelter.

Imports of zinc or spelter into the United Kingdom were 22,247 tons, a decrease of 74 tons, or 0·3%, from last year. Exports for the four months were 46,461 tons, a heavy decrease from 1896.

Antimony is dull at 7¼c. for Cookson's; Hallett's is 7c.; U. S. Star, 6¾c., and Japanese, 6¼c.

Nickel.—Business continues quiet, and no change in prices can be reported. We quote for long lots 33½@36c. per lb., and for smaller orders 35½@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.

Imports of quicksilver into the United Kingdom for the four months ending April 30th were 2,846,465 lbs., against 1,708,497 lbs. for the corresponding period in 1896, an increase of 1,137,968 lbs., or 66·8%. Exports this year were 598,755 lbs., a decrease of 499,760 lbs., or 48·6%. The balance retained this year was 2,247,710 lbs., against 679,932 lbs. last year.

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

Aluminum:	Bismuth, ½ lb.	\$1.50 @ \$1.80.
No. 1, 98% ingots, ½ lb.	Phosphorus, ½ lb.	50 @ 55c.
No. 2, 94% " "	" "	70c.
Ingots scrap, " "	30c.	Tungstic acid, .....
Roller sheets, " 46c. up	30c.	Ferro-tungsten, 6%
Alum.—Nickel, " 35 @ 40c.	.....	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	13.31	13.34	3.32	3.07	4.13	4.07
May	11.03	11.15	13.44	13.51	3.26	3.03	4.21	3.98
June	.....	11.67	.....	13.59	.....	3.03	.....	4.10
July	.....	11.40	.....	13.63	.....	2.96	.....	3.97
August	.....	10.98	.....	13.19	.....	2.73	.....	3.76
Sept.	.....	10.66	.....	13.15	.....	2.77	.....	3.60
October	.....	10.66	.....	12.91	.....	2.80	.....	3.72
Nov.	.....	11.23	.....	13.09	.....	2.96	.....	3.99
Dec.	.....	11.28	.....	12.96	.....	3.04	.....	4.14
Year	.....	10.88	.....	13.29	.....	2.98	.....	3.94

CHEMICALS AND MINERALS.

(For current prices of chemicals, minerals and rare elements see page 561.)

New York. May 28.

Heavy Chemicals.—There has been little buying during the past week, and the market is rather flat. Chlorate of potash, which has been particularly inactive, is expected to become firmer immediately because of an increase of ½c. per lb. in the proposed tariff duty, the rate having now been placed at 2½c. per lb.

We quote: Caustic soda, 60%, \$2.10 @ \$2.15; 70, 74 @ 6%, \$1.90 @ \$2 per 100 lbs. Alkali, 58%, 60c. for 50-ton lots and over, and 70 @ 80c. for smaller quantities; 48%, \$1 @ \$1.20 for jobbing lots. Caustic soda ash, 48%, \$1.50 @ \$1.70. Bleaching powder, prime brands, \$1.75 @ \$1.87½; Continental, \$1.57½ @ \$1.70 per 100 lbs. Continental F brand, \$1.60 @ \$1.65. Bicarb. soda, English, 1.75 @ 2c. per lb.; American, bulk, \$1.50 @ \$3.50 per 100 lbs., according to make. Sal-soda, English, 60 @ 65c.; American, 55 @ 65c. (in barrels), 80c. (in kegs) per 100 lbs. Hyposulphite of soda, 1.52½ @ 1.55c. in casks; 1.70 @ 1.85c. in kegs. Chlorate of potash, 8½ @ 9¼c.

Acids.—Business has not increased in volume, and there is no sign of greater activity. New business is very slim, deliveries being almost entirely on contract orders. 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.**—The supply for spot sales continues scarce, but the dull conditions keep the price rather steady. There seems to be very little doing in this line. Best unmixed seconds are quoted at \$19½@ \$20 per ton for spot sales, and for shipment \$19 is asked. Thirds sell at \$18½ per ton.

**Fertilizing Chemicals.**—The main thing to be noted in this market is its extreme quietness, it being absolutely bare of any special demands. Prices remain practically unchanged, high-grade tankage being the only article that is different, a drop of 50c. per ton having occurred. We quote:

Sulphate of ammonia, gas liquor, \$2.15 for shipment, and \$2.17½ for spot; bone, \$2.05@2.10 per 100 lbs. Dried blood, high grade Western, \$1.60 per unit New York; f. o. b. Chicago, \$1.32½ per unit. Azotine, \$1.52½@1.57½ basis New York. Concentrated phosphate (30% available phosphoric acid), 57½c. per unit. Acid phosphate, 13% @ 15%, av. P<sub>2</sub>O<sub>5</sub>, 54@65c. per unit at sellers' works in bulk. Dissolved bone black, 17% @ 18% P<sub>2</sub>O<sub>5</sub>, 80c. per unit. Acidulated fish scrap, \$9.50, and dried scrap \$18. f. o. b. fish factory. Tankage, high grade, \$12@12½ per ton; concentrated, \$1.27½ per unit, f. o. b. Chicago; New York, \$1.7½@1.8; low grade, \$1.6½@1.7. Bone tankage, \$19@ \$20; ground bone, \$21@23. Bonemeal, \$20@22 50. Sulphate of Potash: 90%, New York and Boston, \$1.99½; Philadelphia, Baltimore and Norfolk, \$2.01; Southern ports, \$2.03.

Double Manure-Salt: 103c. basis of 48%; Philadelphia and Norfolk, 104c.; Southern ports, 105½c. Muriate of Potash: We quote: 178c. at New York and Boston, 179½c. Philadelphia, Baltimore and Norfolk, and 181½c. Charleston, Savannah, Wilmington and New Orleans, for 80@85% basis of 80%, in lots of 50 tons and upward.

Kainit.—Invoice weights, as taken at port of shipment, per ton of 2,240 lbs., testing 12½% 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.**—Although there have been no further arrivals, three vessels have completed discharging their cargoes during the week, and a fourth is in port awaiting the disposition of its 16,000 bags. Under these conditions the quotations below explain themselves. They are: For spot, 175@177½c.; to arrive, 178½@175c., according to position; for shipment, 170c.

#### NOTES OF THE WEEK.

Exports of alkali from the United Kingdom for the four months ending April 30th were 80,491 long tons, of which 42,267 tons, or 52½%, were to the United States. For the corresponding period in 1896 the United States took 46,624 tons, or 54½% of the total exports of 86,218 tons. The total decrease this year was 5,727 tons, or 7½%. Exports of bleach this year were 17,160 tons, showing a decrease of 2,877 tons, or 14½% from last year.

#### Liverpool.

May 19.

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

Some arrangement appears to have been fixed up between the English and Continental chemical manufacturers, as makers here have advanced prices of ammonia, alkali and caustic soda for export to the Continent generally.

Soda ash is in fair request, and ammonia alkali for export to the Continent is held for higher figures. We quote spot range for tierces about as follows: Leblanc ash, 48%, \$4 10s @ \$4 15s. per ton; 58%, \$4 15s. @ \$4 5s. per ton. Ammonia ash, 48%, \$3 5s. @ \$4 per ton; 58%, \$3 10s. @ \$4 5s. per ton, net cash. Bags 5s. per ton under price for tierces.

Soda crystals are selling at £2 17s. 6d. per ton, less 5% for barrels, and 7s. less for bags. Special terms for American orders.

Caustic soda is higher for export to the Continent, although without altering spot range, which we quote: 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 quiet, but without change so far as quotations are concerned, which remain at £6 15s. @ \$7 per ton, net cash, for hardwood packages, as to destination.

Chlorate of potash is inactive, at 4d. per lb. for any position.

Bicarb. soda is firm at £6 15s. per ton, less 2½% for the finest quality in 1-cwt. kegs, with usual allowances for larger packages.

Sulphate of ammonia is a shade firmer at £7 18s. 9d. @ \$8 2s. 6d. per ton, less 2½% for good gray, 24% and 25% in double bags f. o. b. here, and sellers still holding off.

Nitrate of soda is in light demand at £8 2s. 6d. @ \$8 5s. per ton, less 2½% for double bags f. o. b. here, as to quality and quantity.

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

#### Valparaiso, Chile.

April 10.

(Special Report of Jackson Brothers.)

**Nitrate of Soda.**—European quotations have not been at all encouraging for exporters to enter into new operations, the market showing a decided falling tendency. Sales have been effected for April and May delivery at the equivalent of 5s. 5½d. for 95%, and for September at 5s. 7d. We quote 95% for April and May at 5s. 5½d.; June, 5s. 6d.; July to October,

5s. 7d.; for refined, sellers ask 5s. 9d. any delivery. The price of 5s. 5½d. with 16s. freight stands in 6s. 10½d. cost and freight without purchasing commission. Sales during the fortnight amounted to 394,000 metric quintals.

#### MINING STOCKS.

Complete quotations will be found on pages 560, 561 and 562 of mining stocks listed and dealt in at:

New York.	Colorado Springs.	Paris, France.
Boston.	Duluth, Minn.	Mexico.
Philadelphia.	Helena, Mont.	Shanghai, China.
Baltimore.	Salt Lake, Utah.	Valparaiso, Chile.
Pittsburg.	San Francisco.	London, England.
Cleveland.	Denver, Colo.	British Columbia.
Spokane, Wash.	Butte, Mont.	Rossland, B. C.

#### New York.

May 28.

The most interesting feature in the local mining stock market is the rich strike that has been made on the property of the Mollie Gibson Consolidated Mining Company, of Pitkin County, Colo. It will be remembered that several years ago a vein was struck on the property near the sixth level, which gave rich returns, but this vein was cut off by a complicated system of faulting. Work was steadily carried on in search of this vein and it was hoped that the main ore body would be recovered on the 12th or 13th level by sinking the main shaft. Up to the present time the operations in this direction were not very successful, and it is now believed that the long sought-for vein has been found. In consequence of this the stock sold for 10c. at the opening of the week, but made a spurt to 72c. at the close, the highest mark since June, 1896. The Mollie Gibson Consolidated Mining Company paid in dividends up to January, 1895, \$4,080,000. In 1891 there was some trouble about 190,000 shares of the company's stock which had been purchased by J. B. Wheeler, of New York, from J. J. Hagerman, then president of the company.

For a time the stock market had something to talk about, but in July, 1892, everything was settled and Hagerman recovered the stock from Wheeler, it is said without one dollar changing hands between them. Another interesting fact connected with the Mollie Gibson is that for the last few years the Colorado Springs market has been quoting this stock as low as possible so as to draw out the holdings of Eastern people; the result was that about 4,500 shares were sold in New York at that time. Sales from May 22d, 1897, to May 27th were 1,600 shares.

There has been a good demand for Leadville stocks generally, but there are few sellers at present. Cripple Creek stocks are quiet.

The Comstocks were weak. Consolidated California & Virginia sold 15c. lower than last week, and sales were made of 300 shares at \$1.80@1.85. Comstock Tunnel was dealt in to the extent of 2,000 shares at 5c. Ophir sold at 90c., which is 10c. less than the quotation on May 7th; sales were 400 shares. Potosi has not been dealt in since January last, but on May 21th 200 shares were sold at 60c. Savage advanced to 35c. since May 3d, when it sold at 23c. Union Consolidated ruled steady at 30c., with sales of 200 shares. Best & Belcher showed a weakening tendency; it opened at 63c. and declined to 58c., with dealings in 500 shares.

Only one stock of the California group was dealt in. Brunswick Consolidated changed hands at 6@7c., showing trading in 5,300 shares.

The Colombian gold stock within the last few months has been so manipulated as to put up the price from 65½c. in April to 80c. at the close to day, May 28th. The Colombian Gold Mining Company held a meeting on Monday last at its office in New York, and elected Charles O. Maas president in place of Henry George Menard. The latter party informs us that he is going to Paris to place a block of the stock issued by his company on the Bourse there. Some time ago this company engaged R. M. Straus, engineer and superintendent of La Fortuna mine in Arizona, to report upon its property, but nothing has yet been heard from him. The Colombian Gold Mining Company has leased six claims from the Santiago Gold Mining Company, in the United States of Colombia, for a period of 40 years at an annual royalty of 15% on the net earnings. Another stock which is also listed on the Mining Exchange of New York is the Japan of Colorado, and the fluctuations of this since its first calling have been from \$5.87½ in April to \$2 on May 27th; only speculation is given as the reason. Annetta (Colo.) is being gradually lifted to a higher level by room traders. In March last 400,000 shares of the Annetta Gold Mining Company's stock was sold to a syndicate, and at that time Mr. Wilcox, the president of the company, informed us that it rose 25%. It was then selling for 11½@12c., and to-day the quotation is 30½c. A number of sales have been made on the exchange, but principally to brokers.

#### Boston.

May 27.

(From Our Special Correspondent.)

There has been but little doing in mining stocks the past week. The tendency to higher prices for the copper stocks is quite in evidence, while the gold stocks have been only fairly active. In Boston and Montana the transactions have been light, but we note an advance from \$121½ to \$124½, with a slight reaction in later dealings. The stock is well supported and there is evidence of some buying for investment. Butte & Boston shows quite a firm

front and an advance of about \$½ for the week, with sales at \$17½.

Calumet & Hecla opened with a sale of 50 shares at \$370, and on small lots sold up to \$375, which was the highest for the week. Quincy is held firm at \$109, with all sales at that figure. Tamarack declined from \$123½ to \$120 on small lots. There was considerable activity in Franklin on reports from the mines of a favorable character, and the price advanced from \$10½ to \$13. There was good buying of Tamarack, Jr., up to \$17, with reaction to \$16½. A few sales of Kearsarge were noted at \$16 and 60 shares Osceola sold at \$31, an advance of \$½. Old Dominion was firmer at \$15½, an advance of \$½ for the week. A small lot of Atlantic was quoted at \$19. Wolverine, after selling at \$9½, declined to \$9, recovering later to the former figure. Arnold declined to \$2½, but later sold at \$3. Centennial was steady at \$5½@6.

Pioneer was the most active stock in the gold group, advancing from \$3½ to \$3¾. Gold Coin was barely steady at \$4@4¼. Santa Ysabel sold at \$12, the same as last week. Napa Quicksilver sold at \$6¼@6½.

At the afternoon board, Boston and Montana declined to \$123; Pioneer to \$33. Kearsarge was \$½ higher, at \$16½. Gold Coins sold up to \$4¼. Butte & Boston was steady at \$17½.

#### Cleveland.

May 26.

(From Our Special Correspondent.)

There have been several sales of iron stocks during the past week and the indications are that the market will be still more active in the near future. The investment brokers say they have received a number of inquiries for stocks, and they have every reason to believe that a large number of transactions will be made during the next few weeks. Bidders offer \$5 less per share for Pittsburg & Lake Angeline stock this week, and Republic has declined somewhat. On the other hand, Jackson is held at a higher price than was posted last week.

#### Salt Lake City.

May 22

(Special Report of James A. Pollock.)

Except in spots, the list was rather neglected during the past week in the local mining stock market. Prices in the silver-lead section were again lowering, while in the gold section quotations were either advanced or at least strongly maintained. Ajax was slightly shaded, for no good reason. Very light business was done in the stock. Anchor continued dull. A still further decline occurred in Buillon-Beck, which sold below \$5.50. Buckeye was lower, on very light business. No dividend was paid by Centennial-Eureka this month, for the reasons already indicated. The Tintic producers have determined to curtail shipments of ore until the railroads make concessions. Practically no change occurred in the stock, although there was constant inquiry for it. Nothing was done in Chloride Point on the open market. The Dalys were again inactive at unchanged quotations. Dalton was fairly active at fractionally lower prices. Dexter was active only in a small way, and prices did not change. Only light offerings of Eagle have followed the assessment. East Golden Gate continues to be absolutely lifeless. Four Aces was not very active, but prices were not shaded. The May dividend of 3c. per share on Geyser-Marion has been declared and will be paid on May 31st. Galena was active, but at unchanged figures. Horn Silver is developing some gold ore bodies below the 500-ft. level, this being the first gold ore for the properties. Little Pittsburg was active and strong. Mercur's May dividend was paid yesterday. The stock continues in good demand, but prices were not changed materially. Northern Light was somewhat stronger and very active. Ontario was again weak and inactive. Sunbeam was unchanged. In order to make important improvements, South Swansea passed its May dividend; the stock declined sharply, but reacted somewhat at the close. Swansea changed but little. Utah did some business at last week's figures.

#### San Francisco.

May 2.

(From Our Special Correspondent.)

The market opened very quietly on Monday, but developed a little strength later on encouraging reports from the Comstock, and the receipt of some good orders to buy Consolidated California. This did not last long, however, and matters lapsed into dullness again. There was a little spurt in Chollar on Wednesday, which kept up for a couple of days and helped to support the market, which would otherwise have fallen rather flat. The cause of the activity was a report that quartz assaying well in gold had been found in 500 level of the company's workings on the Brunswick lode. The stock continued to fluctuate up to the close, going up to \$1.05 at one time.

Some late quotations are: Consolidated California & Virginia, \$1.70@1.75; Chollar, 90c. @ \$1; Confidence, \$1.02@1.05; Ophir, \$7@91c.; Best & Belcher, \$9@61c.; Potosi, \$6@60c.; Sierra Nevada, \$2@43c. There were some sales of Standard Consolidated at \$1.55.

For the month of April, 1897, the mining, milling and other corporations on and around the Comstock paid \$65,703 for labor, as follows: Hale & Norcross (estimated), \$1,300; Andes, \$900; Consolidated California & Virginia, \$10,408; Mexican, \$1,705; Ophir, \$2,203; Best & Belcher, \$2,358; Gould & Curry, \$818; Alta, \$1,129; Utah, \$433; Occidental (estimated), \$1,500; Brunswick Exploration Company, \$6,940; Crown Point, \$1,555; Yellow Jacket, \$1,753; Con-



fidence, \$603; Challenge, \$223; Belcher, \$2,899; Imperial, \$173; Savage, \$3,434; Bullion, \$969; Chollar, \$3,421; Potosi, \$1,370; Union Shaft, \$2,305; Sierra Nevada, \$706; Alpha, \$716; Overman (estimated), \$1,000; Caledonia (estimated), \$500; Nevada mill, \$880; electric light (estimated), \$500; water company (estimated), \$3,000; quartz mills (estimated) \$5,000. Total, \$65,708. The aggregate of the April pay-rolls was \$5,000 larger than that of March.

**Spokane, Wash.** May 22.

(From Our Special Correspondent.)

Now that the Rossland Exchange has closed, rumors have been circulated that the Spokane Exchange will follow suit. Conservative members of the latter organization, however, are in favor of having it continue to do business. Or course, there are some pessimistic brokers who would consent to a dissolution. Certain it is that this discussion does the exchange harm.

This week's business on the exchange has been better than last by a few hundred shares. The bears have made themselves felt within the last few days. Cariboo opened at 51c, rose to 52c, and receded to 47c. Butte has been worked downward to 1 1/2c, as against 4c last week. There was heavy dealing in Spokane Belle at 1/2@1 1/4c. Noble Five Consolidated was bid for at 41c, and later on in the week 60c. was asked, which is a fraction lower than the closing on May 14th. Josie receded from 58c. on May 17th to 42c. to-day. For Iron Mask, 40c. was asked at the opening, without buyers. The Iron Mask Gold Mining Company held its annual meeting on May 17th, at which 400,163 shares were represented out of a total of 500,000; new officers and directors were elected. The War Eagle Gold Mining Company also held a meeting on the same day, at which the business of the company was wound up. The Virginia Gold Mining Company's meeting was held this week, and 403,574 shares were represented out of a total issue of 500,000 shares.

**Rossland, B. C.** May 20.

(From Our Special Correspondent.)

The dissolution of the Rossland Stock Exchange is one of the events of the week. Differences of opinion which have existed among the members have finally resulted in the disorganization of the Exchange, a resolution to this effect having been carried by a small majority. The minority, it is said, intend reorganizing with a higher franchise and to ballot in their members. There is considerable activity in the producing mines. The Columbia & Kootenay is now a shipper. This makes the fifth mine in the camp which is making regular shipments. The others are Le Roi, War Eagle, O. K. and Iron Mask. The growth of the town, though somewhat ahead of the requirements, continues, especially in buildings and in street improvements. The summer influx is just commencing, and mining men are hopeful of a better market next month than that which has prevailed for some weeks.

**London.** May 19.

(From Our Special Correspondent.)

During the earlier days of the past week the South African boom of which I wrote in my last letter was well sustained, the chief enlivening cause being the record output of the Rand during April. Probably also the squeezing of bears had a good deal to do with the firmness. During the past few days, however, all buying has ceased, and if it were not for the presence of bears, who are trying to buy back, the quotations would fall away again. As it is, they are remarkably firm. Chartered are at £2 1/2, Gold Fields at £6 1/2, and Rand Mines at £22, while the gold-mining companies show considerable advances on a fortnight ago, as will be seen from the table of quotations elsewhere. Political matters engaging the attention of England and the Transvaal have been quiet, and there has been nothing in this way that could be used for stock exchange purposes. The military authorities here are preparing for the despatch of more troops to South Africa, a course which induces firmness in the market generally.

The West Australian market has been pretty lively in sympathy with South Africans, though there has really been nothing substantial about the liveliness. Some very promising statements have been made about some of the mines in Hannans District, but they are only guesses, and are not reliable. That there is an unpleasant doubt about the ultimate history of the West Australian colony is only too obvious from the hesitating way that investors regard the issue of colonial stock. The West Australian government has pretty bad luck in this way. Just recently they offered £1,000,000 in stock, bearing 3% interest, and the issue price of the £100 share was £95. Only about three-quarters of the amount offered was subscribed; as a matter of fact it is somewhat surprising that so much support was given. The gold industry of the colony is not yet established on a paying basis, nor is it even certain that success awaits it in the future. If this industry fails, there is nothing else to pay interest with, for the colony is of little use for agricultural purposes. Consequently the security is not good enough for so low a rate as 3%.

Of other sections of the market, Indians have been the most prominent. As the leading shares here are all pretty high, more attention is given to the smaller companies. Mysore West & Wynaad, which owns part of the same vein as Coromandel, is being brought out of obscurity by those who want

to get a good thing at a low price, and already they have advanced in quotation.

Though the actual amount of public business in Americans and British Columbians is very small, yet the latter are talked about a great deal just now. A paper called the *British Columbia Review* has been started, but, as far as I can gather, it is not backed by any influential support. It has, however, contained some very sound articles, warning English investors of the pitfalls which will be peculiar to investing in properties coming from the province. I hear that the Gold Fields of British Columbia, Limited, a company which I noticed in these columns some weeks ago, is preparing to float a subsidiary company to take over the Albert Canyon properties.

A great deal is heard in the city about the Northwest territories through which the Yukon flows. Reports of rich placers and quartz veins are circulated, but nothing written or printed is obtainable, except some inspired paragraphs which appear from time to time in the *Financial News*. The attempt is being made to form a chartered company to take over the whole territory, and the burden of the song consists in the statement that until there is settled government in the territory miners and settlers should not go there. Surely the Canadian government could rule the territory, without recourse to chartered companies. It manages British Columbia in a satisfactory manner. In England we have had enough of chartered companies and we do not wish for a raid on the Alaska Treadwell mines or on Butte, Mont.; which would be a possibility after mining operations in the Yukon had proved useless.

A company has been introduced to the public this week called the North China Gold Territories Development Company, Limited. This company has been formed to handle the gold mining concessions extending over 30,000 square miles in Mongolia directly north of Pekin, belonging to Prince Tsan. There are gold mines in that tract of country worked by the Chinese, and it is claimed that their tailings assay from 1/2 oz. to 2 oz. of gold. These Chinese must be very different men from those who work the dumps in the West of America, where a dollar a day satisfies the worker.

**Paris.** May 16.

(From Our Special Correspondent.)

The great event of the week has been the advance in the Transvaal gold stocks and the sudden activity which has come into that market after so many weeks of dullness. The result is a rush to unload on the part of those who have been carrying those stocks, but this selling has had no effect on the quotations thus far. No one here believes that the advance will continue or that prices will keep up to the points to which they have so suddenly risen, and every one wants to realize while the activity lasts.

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

	1896.	1897.
	France.	France.
<b>IMPORTS:</b>		
Food.....	350,564,000	281,359,000
Raw materials.....	307,184,000	562,358,000
Manufactures.....	212,694,000	209,848,000
<b>Total.....</b>	<b>1,370,442,000</b>	<b>1,363,565,000</b>
<b>EXPORTS:</b>		
Food.....	207,113,000	199,076,000
Raw materials.....	279,071,000	303,553,000
Manufactures.....	619,453,000	614,029,000
Postal parcels.....	52,002,000	56,534,000
<b>Total.....</b>	<b>1,157,639,000</b>	<b>1,173,192,000</b>
Excess, imports.....	212,803,000	190,373,000

The changes shown this year are small and not important.

A judgment of interest to banks which undertake Bourse operations for their clients has been given by the Paris Tribunal of Commerce. The London-Paris Financial and Mining Company purchased in 1895 in the Paris market a number of Buffelsdoorn, Randfontein and Sheba shares, and in London various shares in other mining companies for the Baroness d'Huart. The lady, not being prepared to take up the shares, instructed the Bank to get them carried over at the account. This was done by the Bank itself, and not through a third party. The Baroness d'Huart subsequently gave instructions to the Bank to sell the shares, and the result was a loss on balance of 57,014fr. The client having discovered that the carry-over had been effected by the Bank and not by other parties, repudiated the transaction on the ground that the Bank had not carried out her instruction, and had become purchasers of the shares, and claimed a balance of 25,990 fr., being the difference between 40,728 fr. she had paid on account of the shares, and 14,737fr. she had received. The Tribunal gave judgment for the client, holding that the Bank by carrying over the shares itself without the knowledge or consent of the purchaser became personally the owners of the shares. The Tribunal said in its judgment that it was not a matter of indifference to the speculator whether the shares were carried over by third parties unknown to him by his proxy, as the secret intervention of the intermediary would have the effect of influencing the rate of settlement by the withdrawal of a part of the operations of the kind from the general market. This judgment has caused surprise in banking circles, as many of the great financial establishments practice the business

for which the London-Paris Bank has been condemned.

A bill to create a bronze coin of 2 1/2 centimes, or half-a-sou, has been approved of unanimously by a committee of the Chamber of Deputies. There are already coins of 1 and 2 centimes, but they are rarely seen and are practically never used. In retail trade shopkeepers always take the half-sou when an odd number of sous has to be divided. With the proposed new coin of 2 1/2 centimes poorer people would certainly insist on receiving their proper change and not accept the excuse of dealers that they have no centimes.

In Paris, as everywhere else, it is the small buyers who suffer from the shopkeepers' petty exactions. The new coin may help them a little, but some other way to secure the profit will be found by our small merchants. AZOTE.

**MEETINGS.**

Alta Argent Mining Company, annual meeting in Des Moines, Ia., on June 8th, at 2 p. m.

Big Johnny Gold Mining Company, annual meeting, at Room 517, Mining Exchange Building, Denver, Colo., on July 17th, at 2 p. m.

Cactus Mining Company, annual meeting in Salt Lake City, Utah, on June 7th, at 2 p. m.

Crown Point Gold and Silver Mining Company, in rooms 35 and 36 Mills Building, San Francisco, Cal., on June 7th, at 1 p. m.

Della S. Consolidated Mining Company, of Iowa, annual meeting in Des Moines, Ia., on June 8th, at 2 p. m.

Homestead Mining Company, annual meeting in Des Moines, Ia., on June 8th, at 2 p. m.

Industrial Gold Mining Company, annual meeting, in the Jacobson Building, Denver, Colo., on June 18th, at 2 p. m.

Little Gem Gold Mining Company, annual meeting, in the Jacobson Building, Denver, Colo., on June 17th, at 2 p. m.

Luella B. Gold Mining Company, annual meeting, at 1529 Fifteenth street, Denver, Colo., on June 24th.

**LATE NEWS**

MR. C. T. MIXER, who recently returned from examining mine in California and Colorado for Chicago parties, has just started for Central America, where he expects to examine and report upon some mining properties.

BI-METALLIC MINING COMPANY.—At the annual meeting at the company's office in Clark, Granite County, Mont., the following trustees were chosen for the ensuing year: L. M. Rumsey, A. B. Ewing, Paul A. Fusz, C. D. McLure, L. M. Rumsey, Charles Clark, H. J. McKellops, J. N. Bofinger, M. Rumsey.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—The spring meeting was held in Hartford, Conn., this week, with a large attendance. There were sessions for the reading of papers and discussion of topics on Tuesday, Wednesday and Thursday, and excursions and visits to points of interest—shops and works—on those days and on Friday. A number of interesting papers were presented.

The investigation of the Coal Trust proposed by Attorney-General Hancock, of New York, has been postponed. Four coal roads—the Delaware, Lackawanna & Western, the Delaware & Hudson, the New York, Ontario & Western, and the Jersey Central—applied for and secured an order requiring the Attorney General to show cause on May 27th why the action had been brought. It was finally decided to have the argument on June 8th.

PHILADELPHIA & READING COAL AND IRON COMPANY.—This company's statement for April and the five months of the fiscal year from December 1st to April 30th is as follows:

	April.	Year.
Receipts.....	\$1,088,392	\$7,319,450
Expenses.....	1,217,509	7,835,359
Deficit.....	\$129,207	\$515,909

Renewals and colliery improvements are included in the expenses; the amount of these items is not stated.

At a meeting of the Nobel Dynamite Trust in London, May 27th, the chairman, in his opening address, said that competition seriously threatened the Trust with the loss of a large portion of its trade with Mexico, where the proprietors of factories established by citizens of the United States favored protective duties on dynamite. This, coupled with cheap freights, would give the Americans considerable advantage. Therefore, in order to protect the trade of the Trust, the directors were considering the establishment of dynamite factories both in the Eastern and Western parts of the United States. One site, the chairman added, had already been secured in a suitable locality, and this may require an important increase of capital, probably \$2,500,000. No definite decision on the subject was arrived at at the meeting.

ASSESSMENTS.

Table with columns: Name of Co., Loc'n., No., Dinq., Sale, Am. Lists various companies and their assessment details.

\*New assessment.

NAME OF COMPANY.

Table with columns: NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date. Lists companies and their financial data.

DIVIDENDS.

Table with columns: NAME OF COMPANY, Current Dividends, Paid since Jan. 1, 1897, Total to date. Lists companies and their dividend information.

\* April dividend paid.

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.

STOCK QUOTATIONS.

BALTIMORE, MD.\* Week ending May 27.

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Ask. Lists Baltimore stock prices.

\*Official quotations Baltimore Stock Exchange.

BOSTON, MASS.\*

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Ask. Lists Boston stock prices.

\* Official quotations Boston Stock Exchange. Total sales, 18,164.

CLEVELAND, O.

Table with columns: NAME OF COMPANY, Par value, Bid, Ask. Lists Cleveland stock prices.

PHILADELPHIA, PA.\*

Table with columns: NAME OF COMPANY, Location, Par value, Bid, Ask. Lists Philadelphia stock prices.

\* Official quotations Philadelphia Stock Exchange. Total sales, 1,512.

DENVER, COLO.\*

Table with columns: NAME OF COMPANY, Par val., May 17, May 18, May 19, May 20, May 21, May 22, Sales. Lists Denver stock prices.

\* Official quotations Colorado Mining Stock Exchange. Total shares sold, 1,169,950.

HELENA, MONT.\*

Week ending May 21.

Table with columns: NAME OF COMPANY, Location, Company's office, Par value, Bid, Asked, Shares sold, Price. Lists Helena stock prices.

\* Special Report of Samuel K. Davis. Total shares sold, 13,000.

COLORADO SPRINGS, COLO.\*

Table with columns: NAME OF COMPANY, Par val, May 17, May 18, May 19, May 20, May 21, May 22, Sales. Lists various mining and industrial companies with their stock prices and sales figures.

\* Official quotations Colo. Springs Mining Stock Assoc. Total shares sold: Listed, 3,280; unlisted, 2,870.

PITTSBURG, PA.\*

Week ending May 25.

Table with columns: NAME OF COMPANY, Location, Par val, Bid., Ask., Selling price, NAME OF COMPANY, Location, Par val, Bid., Ask., Selling price. Lists companies like Allegheny, Carnegie, and others.

\* Official quotations Pittsburg Stock Exchange.

SALT LAKE CITY, UTAH.\*

Week ending May 22.

Table with columns: STOCKS, Par value, Bid., Asked, Actual selling price, STOCKS, Par value, Bid., Asked, Actual selling price. Lists companies like Ajax, Alliance, and others.

\* Special Report of James A. Pollock. † All the companies are located in Utah.

NEW YORK.\*

Table with columns: NAME OF COMPANY, Location, Par val, May 22, May 24, May 25, May 26, May 27, May 28, Sales. Lists various mining and industrial companies.

SAN FRANCISCO, CAL.\*

Table with columns: NAME OF COMPANY, Location, Par. value, May 21, May 22, May 23, May 24, May 25, May 26, May 27. Lists companies like Alpha Con., Alta, and others.

\* Official telegraphic quotations, San Francisco Stock Exchange.

SPOKANE, WASH.†

Table with columns: NAME OF COMPANY, Par val, May 17, May 18, May 19, May 20, May 21, May 22, Sales. Lists various mining and industrial companies.

† Official quotations Spokane Stock Exchange. \* Selling prices. Shares sold: Listed, 19,400; unlisted, 22,000; total, 41,400 shares.

COAL AND INDUSTRIAL STOCKS

Table with columns: COMPANY, Par val, May 17, May 18, May 19, May 20, May 21, May 22, Sales. Lists companies like American Coal, Col. C. & L. Dev., and others.

\* Official quotations. New York Stock Exchange, mining 600 shares; other stocks, 13,863 shares; Consolidated Stock and Petroleum Exchange, mining, 17,000 shares; Mining Exchange, 14,150 shares. Total shares sold, 92,613. † Ex-dividend.

ROSSLAND, B. C.

May 20.

Table with columns: NAME OF COMPANY, Par value, Selling price, NAME OF COMPANY, Par value, Selling price. Lists various mining companies and their share prices.

LONDON.

May 14.

Table with columns: NAME OF COMPANY, Country, Author capital, Par value, Last dividend, Quotations. Lists international mining companies and their financial details.

MEXICO.

Week ending May 19.

Table with columns: NAME OF COMPANY, State, No. of shares, Last dividend, Last assessment, Prices (Opening, Closing). Lists Mexican mining companies and their share prices.

NOTE. - In most 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. Prices are in Mexican dollars.

PARIS.

Week ending May 16.

Table with columns: NAME OF COMPANY, Country, Product, Capital Stock, Par value, Div. last year, Prices (Op'ning, Closing). Lists European mining companies and their share prices.

VALPARAISO, CHILE.\*

Apr. 10.

Table with columns: NAME OF COMPANY, Location, Capital paid, Sh. Val., Last Dividend, Bids, Asked, Last sale. Lists Chilean mining companies and their share prices.

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

SHANGHAI, CHINA.\*

April 30.

Table with columns: NAME OF COMPANY, Country, No. of shares, Value (Par, Paid up), Last dividend (Date, Amount), Price (Tael). Lists Chinese mining companies and their share prices.

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

BUTTE, MONT.

May 21.

Table with columns: NAME OF COMPANY, Par value, Bids, Ask, NAME OF COMPANY, Par value, Bids, Ask. Lists Montana mining companies and their share prices.

DIVIDEND-PAYING MINES.

NON-DIVIDEND-PAYING MINES.

Main table with columns: Name and Location of Company, Capital Stock, Shares (No., Par Val, Total Levied, Date and Amount of Last), Dividends (Total Paid, Date and Amount of Last), Name and Location of Company, Capital Stock, Shares (No., Par Val, Total Levied, Date and Amount of Last).

G. Gold, S. Silver, L. Lead, C. Copper, B. Borax. \* Non-assessable. + The Deadwood previously paid \$275,000 in eleven dividends and the Terra \$75,000. + Previous to the consolidation in August, 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 have not been paid in several years. NOTE.—This table is corrected up to May 1. Correspondents are requested to forward changes or additions so as to reach us before the end of each month.

