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We have once more to congratulate our readers on the wonderfully successful year just closed. The reports which we are able to present in this number show that the Mineral Industry of the United States has again established a new record in almost all of its varied departments. In coal and coke we now lead the world, surpassing the output of our great rival, Great Britain, for the first time. In the industrial metals—iron, copper, and others—we also lead the world. In gold, it is true, we have to yield first place to Australasia, but our production shows a substantial increase. The value of our total mineral output is not only far greater than we have ever recorded before, and is far greater than that of any other country in the world, but large as the production for 1899 is shown to be, there is every prospect of a still greater one in 1900.

We have to extend our hearty thanks to our correspondents and subscribers, and to the numerous producers whose cordial co-operation has done so much toward enabling us to present at this early date so nearly complete a record of the mineral production of the year just closed. Until the "Engineering and Mining Journal" undertook to collect these statistics as the year closed and to present them promptly, no one had considered such an achievement possible. That its success has been so great is very largely due to the general and intelligent assistance we have received in many quarters—for which we repeat our acknowledgements.

Lack of space obliges us to put off until next week the publication of some interesting reviews of mining progress in different districts. We regret the delay, but trust that the 40 pages packed with facts relating to the growth of our mineral industry, which we present to-day, will be a full and sufficient excuse for the postponement.

THE METAL AND MINERAL OUTPUT OF THE UNITED STATES IN 1899.

Below is given, as a preliminary statement, a summary of the production of the more important metals and minerals in the United States for 1899, together with the corresponding figures for 1898. These statements, though compiled with the greatest care, are necessarily subject to revision in future numbers of "The Engineering and Mining Journal" as more direct returns come in, and the final complete statement will be published in "The Mineral Industry," Volume VIII, in a few months. While, in some cases, owing to the absence of complete returns, we have been obliged to estimate the production of particular substances on the basis of reports in hand, which cover, however, a large proportion of the output, the statistics given below have been nearly all compiled from direct returns from the producers and from railway companies. We note with pleasure that the responses to our inquiries have been more prompt and numerous this year than ever before, thus enabling us to present very accurate figures on a large number of substances. The statistics regarding gold, pig iron, lead, nickel, quicksilver and zinc vary but very little from what the final statements will be. The reports we have received cover, in a great number of cases, the output for the total year, with the exception of a couple of weeks in December. The statistics given for copper production are the same as those collected by John Stanton, Esq., statistician for the Associated Copper Producers, except that we have added our own estimate, based on very full returns from producers, of the amount of copper turned out as copper sulphate. This not being included in Mr. Stanton's figures, it is to be expected that our revised statistics of copper production will, as usual, be somewhat larger than Mr. Stanton's. The statistics that we give regarding gold are based on the reports of the refiners of crude bullion and the exporters of argenteriferous matte and ingot copper.

The total production of metals in the United States in 1899 was \$413,758,414, as compared with \$314,255,620 in 1898. Of non-metallic substances the output was \$601,872,631, as compared with \$483,091,970 in 1898. The statistics that we have collected regarding various minerals being much fuller than usual, the number of minerals and products included under the heading of "other substances" is less in our 1899 returns than ever. The output of the "other substances" in 1899 is in part estimated as having increased at the same rate as the total of those substances for which we have direct returns. Included among "other substances" in this subjoined table are corundum, crushed steel, diatomaceous earth, emery, grindstones, quartz crystal, tripoli, whetstones, alum, and aluminium sulphate, ammonium sulphate, asphaltum and bituminous rock, excluding grahamite, borax, calcium carbide, clay and clay products, feldspar, gypsum, magnesite, manganese ore, mica, mineral wool, natural gas, ochre and oxide of iron, precious stones, silica, sand, soapstone, natural soda, building stone, sulphuric acid, and also such little mined minerals as uranium, tungsten and lithium ores.

Deducting certain duplications, such as lead used in making white lead, coal used for coke, etc., which amounted to \$121,206,968 in 1899, against \$87,530,840 in 1898, it appears that the grand total of mineral production in the United States in 1899 was \$891,424,082, as compared with \$709,816,750 in 1898.

Metallic Products.

Aluminum.—The high price of copper and the suitability of aluminum for conductors has given the sole producer an opportunity to supplant copper to some extent in electric power work. The consumption for minor uses is also increasing. The output of 1899 was 6,500,000 lbs., as against 5,200,000 lbs. in 1898.

Antimony.—We regret that producers have declined to furnish figures of production, and in the absence of returns we estimate the output at 2,000,000 lbs., the same as in 1898.

fourth. The Alaskan output from Cape Nome was \$3,000,000, and from the placers on the American Yukon, \$2,000,000.

Pig Iron.—The production of pig iron shows an enormous increase for the year, the total output being 13,649,453 long tons, as compared with 11,560,165 long tons in 1898, which had been the best year on record, showing an increase of about 20 per cent. over 1897. As the stocks of ore on hand at the beginning of 1899 did not differ relatively much than those on hand at the opening of 1898, the increase in the production of pig iron indicates pretty closely the increase in the amount of ore mined; the total output of ore for the year was about 25,341,000 long tons, compared with 20,655,865 long tons in 1898.

Lead.—The total production of lead in the United States, including that produced from foreign ores and bullion, was 291,038 short tons in 1899, compared with 317,684 short tons in 1898. The amount produced

UNITED STATES MINERAL AND METAL PRODUCTION.

Products.	Customary Measures.	1898.				1899.			
		Quantity.		Value at Place of Production.		Quantity.		Value at Place of Production.	
		Customary Measures.	Metric Tons or Kgs.	Totals.	Per Metric Ton or Kg.	Customary Measures.	Metric Tons or Kgs.	Totals.	Per Metric Ton or Kg.
NON-METALLIC:									
1 Asbestos.....	Short Ton..	885	803	\$19,425	16.72	912	827	\$19,980	\$16.90
2 Barytes.....	Short Ton..	28,247	25,626	112,988	4.41	30,296	27,485	121,184	4.41
3 Bauxite.....	Long Ton..	26,791	27,220	66,978	2.46	35,842	36,415	98,565	2.71
4 Bromine.....	Pounds....	486,978	221	136,354	617.19	460,000	209	149,960	712.25
5 Carborundum.....	Pounds....	1,594,152	723	151,444	209.47	1,632,407	740	146,916	198.54
6 Cement, nat. hydraul.....	Barrels....	8,161,078	1,110,552	3,819,995	3.44	10,048,447	1,362,852	4,778,539	3.51
7 Cement, Portland.....	Barrels....	3,584,586	650,383	6,168,106	9.48	5,146,064	933,695	8,567,256	9.18
8 Coal, anthracite.....	Short Ton..	52,848,605	47,943,940	81,445,987	1.70	56,697,525	51,435,657	90,193,548	1.75
9 Coal, bituminous.....	Short Ton..	165,208,025	149,875,737	128,419,354	0.86	187,843,750	170,410,732	156,675,876	0.92
10 Coal, cannel.....	Short Ton..	49,889	45,259	134,700	2.98	40,000	36,288	100,000	2.76
11 Coke.....	Short Ton..	15,597,797	14,422,387	30,505,563	2.12	19,344,883	17,549,561	34,431,360	1.96
12 Cobalt oxide.....	Pounds....	9,640	4,373	15,424	3.53	10,300	4,627	15,810	3.42
13 Copper sulphate.....	Pounds....	55,119,361	25,002	1,879,570	75.18	67,083,499	30,885	3,488,654	112.96
14 Copperas.....	Short Ton..	11,285	10,238	58,105	5.68	13,895	12,560	97,265	7.74
15 Fluorspar.....	Short Ton..	12,145	11,018	86,985	7.89	24,170	12,927	148,595	6.78
16 Fuller's earth.....	Short Ton..	15,553	14,110	57,365	6.19	14,463	13,121	87,377	6.65
17 Garnet.....	Short Ton..	2,882	2,615	82,030	31.71	2,295	2,082	63,225	30.36
18 Grahamic.....	Short Ton..	2,675	2,427	80,250	33.07	3,015	2,735	90,450	33.07
19 Graphite, amorphous.....	Short Ton..	1,200	1,089	11,400	10.47	2,631	2,387	20,995	8.80
20 Graphite, crystalline.....	Pounds....	1,647,679	747,382	148,291	0.20	3,243,383	1,473,457	262,671	0.17
21 Graphite, artificial.....	Pounds....	185,647	84,209	11,603	0.14	378,410	171,646	30,273	0.17
22 Iron ore.....	Long Ton..	20,655,865	20,986,359	37,593,674	1.79	25,341,000	25,746,456	51,188,820	1.99
23 Lead, white.....	Short Ton..	93,172	84,525	9,391,738	111.11	108,282	93,697	10,844,610	115.74
24 Lead, red.....	Short Ton..	9,160	8,310	916,000	139.59	9,900	9,081	1,089,500	114.47
25 Lead, orange mineral.....	Short Ton..	541	491	108,200	220.37	988	851	140,503	165.10
26 Limestone, flux.....	Long Ton..	5,275,819	5,360,232	2,804,900	0.43	6,224,151	6,344,057	2,727,945	0.43
27 Litharge.....	Short Ton..	7,460	6,768	710,192	104.93	10,473	9,401	1,100,503	117.06
28 Monazite.....	Pounds....	150,000	68	7,500	110.23	330,000	150	18,540	123.20
29 Petroleum, crude.....	Barrels....	51,774,465	7,243,509	42,100,522	5.81	54,048,100	7,566,734	62,911,637	8.31
30 Phosphate rock.....	Long Ton..	1,257,645	1,277,717	4,355,025	3.41	1,738,372	1,766,186	5,361,269	4.83
31 Pyrites.....	Long Ton..	191,160	194,219	589,329	3.05	176,308	179,027	556,474	3.11
32 Salt.....	Barrels....	18,756,394	2,382,197	4,753,664	2.00	19,025,794	2,416,412	4,731,951	1.96
33 Slate, roofing.....	Squares...	1,136,632	343,715	2,958,496	8.61	1,155,652	349,469	3,249,303	9.29
34 Slate, manufactory.....	Squares...		340,622	528,856			368,000	514,042	
35 Soda, manufactured.....	Metric Ton..		4,080,651	4,080,651	11.98		3,600,000	5,550,270	15.29
36 Sulphur.....	Long Ton..	2,726	2,770	59,754	21.57	1,837	1,358	29,021	21.37
37 Zinc, white.....	Short Ton..	32,747	29,708	2,226,796	74.96	31,663	28,615	2,849,670	99.59
38 Zinc ore, exported.....	Short Ton..	11,782	10,688	299,870	28.06	27,526	24,972	711,189	28.48
Other products unspecified.....				116,676,933				145,765,085	
Total non-metallic.....				\$483,091,970				\$601,872,631	
METALS:									
39 Aluminum.....	Pounds....	5,200,000	2,317,705	1,690,000	0.72	6,500,000	2,948,380	2,023,834	0.72
40 Antimony.....	Pounds....	2,000,000	907	165,000	181.92	2,000,000	907	190,000	209.48
41 Copper.....	Pounds....	535,900,232	243,083	63,129,407	259.70	592,672,637	268,835	102,887,969	382.72
42 Gold.....	Ounces....	3,148,642	97,933	65,082,430	664.60	3,506,679	109,069	72,483,055	664.60
43 Iron, pig.....	Long Ton..	11,560,165	11,745,128	110,168,372	9.38	13,649,453	13,667,844	149,734,499	10.79
44 Iridium.....	Ounces....	8.5	255	255		8.5	255	255	
45 Lead.....	Short Ton..	228,475	207,271	17,272,710	83.33	213,003	193,226	19,002,468	98.34
46 Nickel.....	Pounds....	11,145	5,025.3	3,845	0.76	22,500	10,205.9	8,175	0.81
47 Platinum.....	Ounces....	300	3.837	411.25	411.25	300	3.837	411.25	411.25
48 Quicksilver.....	Flasks....	30,493	1,058	1,109,445	1,049.09	28,713	996	1,378,224	1,665.60
49 Silver.....	Ounces....	58,763,127	1,827,723	34,670,245	18.97	61,179,689	1,902,860.4	36,573,218	19.12
50 Zinc.....	Short Ton..	114,104	103,514	10,429,106	100.75	135,796	123,194	15,616,530	126.76
Other metals unspecified.....				10,530,828				13,856,350	
Total metals.....				\$914,255,620				\$413,758,414	
Total non-metals and metals.....				\$797,347,590				\$1,015,631,045	
Deduct duplications.....				87,530,840				124,206,963	
Grand total.....				\$709,816,750				\$891,424,082	

Cobalt Oxide.—The sole producer of this substance in 1899 increased its output to 10,200 lbs., from 9,640 lbs. in 1898.

Copper.—High prices for the metal have stimulated mining, but the total output of copper for the year from domestic ore was, after making allowance for that recovered in the by-product copper sulphate, 592,672,637 lbs., showing a gain of only about 11 per cent. over the 1898 figures, 535,900,232 lbs., the normal increase of production being about 10 per cent.

Copper Sulphate.—The production in 1899 was approximately 67,089,499 lbs., including 26,239,499 lbs. recovered as a by-product in the electrolytic refining of copper. The 1898 production was 55,119,361 lbs., including 28,068,501 lbs. recovered as by-product.

Gold.—The production of gold in the United States in 1899 reached the great total of \$72,483,055, an increase of \$7,400,625, or 11.4 per cent., over 1898. The gain came chiefly from the two leading States, Colorado and California, and from Alaska. The statistics so far received show Colorado first, with California second, South Dakota third and Alaska

fourth. The Alaskan output from Cape Nome was \$3,000,000, and from the placers on the American Yukon, \$2,000,000.

Silver.—Figures so far received show a production of 61,179,689 oz. in the United States for 1899, an increase of 2,416,562 oz. over in 1898. All this, as well as the cobalt oxide produced in this country, came from the Mine La Motte, in Missouri. The total production by refiners in the United States from both Canadian and domestic ores, including the nickel turned out as nickel oxide, was 8,052,047 lbs. in 1899, compared with 7,138,929 lbs. in 1898.

Quicksilver.—The production of quicksilver from California mines in 1899 was 28,713 flasks. There was a small output in Texas; the Oregon mines produced nothing. The total output in 1898 was 30,493 flasks.

Silver.—Figures so far received show a production of about 63,000,000

oz. in the United States for 1899, an increase of about 4,000,000 oz. over 1898. There was, as usual, a large production from imported ore and bullion, most of which came from Mexico.

Zinc and Zinc Ore.—The production of the various refineries and smelters in this country in 1899 was 135,796 short tons. High prices for the metal stimulated the output, the 1898 figures being 114,104 short tons. The increase in production has been pretty evenly divided among the Eastern, Illinois and Indiana, and Missouri and Kansas works. Our exports of zinc ore more than doubled, being 27,526 short tons in 1899 and 11,782 short tons in 1898.

Zinc White.—The production of zinc white in 1899 shows a decrease as compared with 1898, the figures for the two years being 31,663 short tons and 32,747 short tons, respectively.

Non-Metallic Products.

Asbestos.—The total production of asbestos in 1899 was 912 short tons, almost all of which came from the mines of the Sall Mountain Asbestos Company in Georgia, the 1898 output of which was 885 tons.

Barytes.—The production of barytes in 1899 shows a slight gain, the output being 30,296 short tons, compared with 28,247 short tons in 1898. Most of the increase came from the Missouri deposits, although the Virginia mines were as busy as usual.

Bauxite.—Most of the bauxite mined in 1899 came from the deposits in Georgia and Alabama, the output of the Missouri mines being small. The total production was 35,842 long tons in 1899, compared with 26,791 long tons in 1898.

Bromine.—The production of bromine in 1899, including that produced as bromide of potassium, was 460,000 lbs, the production showing a slight decrease from the 486,978 lbs. produced in 1898.

Carborundum.—The sole producer of this substance, used as an abrasive, and also in steel making, increased its output to 1,632,407 lbs. in 1899, from 1,594,152 lbs. in 1898.

Cement.—Owing to great activity in all building enterprises, the production of both Portland and hydraulic cements during the past year was very heavy. The most marked increase in the output of the natural rock cements coming from the Indiana-Kentucky Region. The total output for 1899 was 10,048,447 bbls. of 300 lbs., each compared with 8,161,078 bbls. in 1898. The production of Portland cement also shows a great gain, the increase being most marked in Michigan, New Jersey and Ohio, the New York works showing an actual decrease. Several producers of slag cement have come into the market, and at least one is known to be meeting with success. The total production of Portland cement in 1899 was 5,146,064 bbls. of 400 lbs. each, compared with 3,584,586 bbls. in 1898.

Coal and Coke.—The United States now leads the world in coal production. The total output of the mines in 1899, including anthracite used locally, was 56,697,525 short tons of anthracite and 187,843,750 short tons of bituminous, making a grand total of 244,581,275 short tons, compared with 218,106,519 short tons in 1898. The production of coke in 1899 also gained heavily, being 19,344,833 short tons, against 15,897,797 short tons in 1898.

Copperas.—The output for 1899 was 13,895 short tons, as compared with 11,285 short tons in 1898.

Fluorspar.—Production has doubled during the year, chiefly owing to the activity of the mines in Kentucky. The output was 24,170 short tons, as against 12,145 short tons in 1898.

Fuller's Earth.—The total production of fuller's earth in 1899 was estimated at 14,463 short tons, the greater part of which came from Florida. The production declined somewhat, the output in 1898 having been 15,553 tons. New mines are being opened on the Pacific Coast, near Bakersfield, California, by the California Fuller's Earth Company, which promise well. The chief use of the article is by refiners of petroleum and cotton seed oil.

Garnet.—Owing to the competition of other substances as abrasives the output of garnet shows a decline. Most of it continues to come from the Adirondacks. The 1899 output was 2,295 tons, compared with 2,882 short tons in 1898.

Grahamite.—There were 3,015 short tons of grahamite mined in 1899, nearly all of which came from Utah. The 1898 production was 2,675 short tons.

Graphite.—The production of crystalline graphite in 1899 was 3,248,383 lbs., as against 1,647,679 lbs. in 1898. The great bulk of the output came from mines in New York State. The Philadelphia Graphite Company, however, greatly increased the output of its mines in Chester County, Pennsylvania, and a new Pennsylvania producer, the Standard Graphite Company began work. There was a production of 2,631 short tons of amorphous graphite in the year, compared with 1,200 tons in 1898, most of the increase coming from the mines of the Philadelphia Graphite Company. The production of artificial graphite at the works at Niagara Falls has made great progress, and the output in 1899 was 378,410 lbs., as compared with 185,647 lbs. in 1898.

Limestone Flux.—The production of limestone for flux varies according to the activity of the blast furnaces of the country. The 1899 production was 6,224,151 long tons, as against 5,275,819 long tons in 1898.

Phosphate Rock.—The output of phosphate rock shows a decided gain, though there is not the wonderful increase shown by 1898 figures as compared with 1897. The output in 1899 was 1,738,372 long tons, compared with 1,257,645 long tons in 1898. The increase is most marked in the Tennessee fields.

Pyrites.—The output of the American pyrites mines shows an actual falling off during the year. The great bulk of the ore mined continues to come from Virginia. The production in 1899 was 176,208 long tons, compared with 191,160 long tons in 1898.

Petroleum.—The total output of crude petroleum in 1899 was 54,048,100 bbls. The price per barrel rose decidedly during the year, greatly increasing the activity of drillers without proportionate results. The 1898 output was 51,774,465 bbls.

Salt.—There was a decided increase in the output of salt for 1899, the amount being 19,025,794 bbls., in comparison with 18,756,394 bbls. in 1898. The New York, Michigan, Kansas and Louisiana producers have been generally active.

Slate.—The total amount of roofing slate produced in 1899 was 1,155,652 squares, compared with 1,136,632 squares in 1898. The value of manufactured slate shows a decrease, being \$514,042 in 1899, against \$528,856 in 1898.

Soda.—The domestic production of soda, including soda ash, caustic soda, and other products, reduced to a common basis of 58 per cent. soda ash, in 1899 was 363,000 tons, compared with 340,622 metric tons in 1898. This increase has come chiefly from the Solvay Process Works, the electrolytic process works showing, if anything, a decrease.

Sulphur.—The production of sulphur fell off more than one-half, chiefly owing to the competition of Japanese sulphur, which can be laid down cheaper than the Nevada product in the San Francisco market. The production in Louisiana is almost stopped. The output for the year was 1,337 long tons, compared with 2,726 long tons in 1898.

Talc.—There was mined in 1899 59,470 short tons of fibrous talc, as against 54,807 short tons in 1898, the total production in both years coming from mines in New York State.

ANTIMONY IN 1899.

There was little change in the production of antimony during 1899, the Matheson Smelting Company of New York and the Chapman Smelting Company of San Francisco continuing the sole refiners of the metal. Antimony ores were mined in California, Nevada, Idaho and Utah.

The New York Antimony Market During 1899.

Throughout the year the market has been active, and prices have ruled higher than during 1898. The metal has risen, but has not fluctuated much, the ratio of supply and demand remaining about the same. It is true the consumption in this country has increased and the production has not increased to the same extent, but imports have become larger, and the European values have thus continued to determine the prices here. The principal supplies continue to be drawn from England, while those from the Continent are constantly increasing. Japan has during the past year exported but little.

The year opened with Cookson's selling at 9¼c., Hallett's, United States Star, "C," and Hungarian at 8¾c. to 8½c. At the end of January, in consequence of a general depletion of stock, the market slowly advanced about ¼c. In February the demand became very persistent, and in spite of large arrivals, an advance to 10c. for Cookson's, and 9¾c. to 10c. for other brands, was established. These prices ruled for a number of months, but during the summer Cookson's advanced to 10½c. and the other brands to 10c. At the end of the year values eased off somewhat and closed, Cookson's 10c., Hallett's, United States Star, "C," and Hungarian, 9½c. to 9¼c.

The London Antimony Market in 1899.

Prices for antimony have improved during the past year and remain at the best. From £36 10s. to £37 in January they rose in February to £38 10s. to £39, the position of the article then being very strong. In April it was quoted firm at £39, and a further advance of 10s. took place in June.

Throughout the remainder of the year prices have remained firm at £39 to £40, with a steady business doing. The same causes which have been at work in the metal trades generally are no doubt responsible for these higher values, and there does not seem to be any visible prospect of antimony being obtainable at cheaper prices for some time to come.

COPPER IN 1899.

Copper production in the United States in 1899 was exceedingly active, but for a number of reasons shows only a moderate increase over 1898. In that year the total output, including copper in sulphate, was 535,900,232 lbs. In 1899 the figures as furnished us by Mr. John Stanton, who acts as statistician for the companies, with the month of December estimated, show a total of 585,616,640 lbs., to which is to be added 7,055,997 lbs. of copper in sulphate, making a total of 592,672,637 lbs.;

and showing an increase of 56,772,405 lbs., or 10.6 per cent. This production is about 65 per cent. of the total output of copper in the world, and the United States, therefore, retains—as it is likely to do for many years to come—a commanding position in the world's market for this metal. Although the increase in production was only a moderate one, the enlargement in consumption was very great. Our total exports in 1899, estimating December, were 115,050 long tons of fine copper, or a little over 20,000 tons less than in 1898. There was no accumulation of stocks by any producer or dealer during the year, so that the increase in production coupled with the decrease in exports indicates that some 35,000 tons of copper were added to our domestic supply in 1899, and that the consumption in that year was greater than in 1898, by this very large quantity. This is not to be wondered at, when we consider the extreme activity in construction work of all kinds, in which copper and its alloys are used; and especially the very large amount of electrical work—railroad, power-transmission, lighting and electrolytic—which has been constructed during the year.

The three important producing States heretofore had been Montana, Michigan and Arizona. In 1898 Montana produced about 40 per cent. of all the copper mined in the United States, Michigan about 30 per cent., and Arizona, 20 per cent. The proportions in 1899 changed somewhat, although the States still hold their relative rank. In Montana there was a material falling off, which resulted from several causes. The chief of these was the litigation which is now going on in Butte, and which involves three large producers—the Anaconda, the Boston & Montana and the Montana Ore Purchasing Company, and which through injunctions and other legal orders has interfered with the output of several of the large producing mines. Another cause has been the decrease in production of the Anaconda properties, the causes of which are not entirely clear, especially as the company has ceased making its reports public. It is said, however, that one reason for this is the fact that grade of the ore is lower at the depths now reached; and it is certain that there is a considerable waste in the somewhat imperfect methods of concentration and other treatment of the ore now in use, in the company's works.

The organization of the Amalgamated Copper Company, which owns a controlling interest in the Anaconda and is understood to be also a very large owner in the Boston & Montana, the Parrot, and the Butte & Boston companies, and which is also owner of the still undeveloped Washoe property—which is said to be extremely valuable—may have an important effect upon the Butte mines. It was given out at the organization of this company that its object was to consolidate under one head all the copper-producing mines of Butte. So far this purpose has been but imperfectly carried out, and the future of the company is still very doubtful. While little can be expected until the present litigation affecting the title to some of the best mines in the district is settled, it is quite possible that improvements in methods, may be introduced which will in time much improve the productive capacity of the district; and will make it correspond much more nearly than it does at present to the great possibilities which it contains.

In Michigan the changes in production have not been very large. In some of the older mines, such as the Calumet & Hecla, the Tamarack, the Quincy, the Osceola and the Wolverine, production has been pushed as far as possible, and there has been a fair increase in the output of copper. In other mines there has been little change, and in some even a decrease. Thus the Franklin Company has failed to find the expected values in its Franklin Junior property, and may be regarded as a worked out mine, and there are other instances of the same kind. When a rise in prices began early in the year, a large number of new companies were organized to work new tracts in the Lake Superior Copper Region, and several old mines were revived, re-incorporated, and development work begun. None of these concerns, however, can be yet ranked as producers; some of them are worth little or nothing, and others, which may have value, cannot be included in the producing list before 1901 or 1902, as is well known it takes three years and an expenditure of \$750,000 to make a mine in the Lake Superior District, and what proportion of the new companies will be able to surmount the difficulties as presented is still uncertain.

The largest increase in production, both actual and proportional, has come from the Arizona mines, where work has been carried on very actively in all the large mines. The Arizona Copper Company, the Detroit, the United Globe, the Copper Queen, and above all the United Verde, have been most actively exploited, and have been large producers throughout the year. Some increase has also come from the smaller mines, especially in Yavapai County, and in the Dragoon Mountains in Cochise County, where some promising developments have been made. Some of those which promised much a year ago have made no returns thus far, and this is especially the case in the Grand Canyon District. While something may be done in that district when better transportation facilities are provided, it is apparent that some of the Arizona projects which were brought out during the later half of 1898, and the first half of 1899, must be classed as failures. Nearly all these appeal to the public on the ground of their neighborhood to some large producing mine.

In California the Mountain Copper Company, at Keswick, has continued to be a steady producer. Some of the mines in Shasta County, are under development, but none of them is yet a producer on any considerable scale. In Utah there was in 1899 a large comparative increase in the output of copper, the total amounting to about 9,000,000 lbs. Most of this came from the Highland Boy Mine of the Utah Consolidated Gold Mines Company, which has been successfully worked through the year, so far as the production of ore is concerned, although the new smelting works have not attained the success which was expected. In this State work on the low grade deposits in the Bingham District has been generally abandoned since it has become almost certain that their operation would not pay. Some other deposits of promise are reported, however, which may develop into mines in the future. In Colorado there has been a gain in production which comes, however, from ores which are worked chiefly for their gold and silver contents; but development is being carried on actively in Routt and Montrose counties, where the claims are valuable for their copper contents chiefly. In the other Western States no important changes can be noticed. The

Seven Devils District in Idaho, for which so much has been promised at different times during the past four or five years, has made very little progress. The Grand Encampment District in Wyoming is still encumbered by lack of transportation and other difficulties.

In the East and South there is a prospect of a large increase in copper production in the future. One of the most important changes has been the purchase of a number of the old properties in the vicinity of Ducktown, in Tennessee, by New York parties, headed by the Lewissohns, who promise to work them systematically and on a large scale. In Vermont the Elizabeth Mine, at Strafford, has developed a large and valuable ore body, while the old Ely Mine at Copperfield has recently been sold to Mr. George Westinghouse of Pittsburg, who intends to work the property systematically and intelligently. There is a prospect also that the mines at Corinth will soon be in a fair way toward regular production.

Copper Sulphate.—The production of copper sulphate in the United States in 1899 amounted to 67,089,499 lbs., an increase of 11,970,138 lbs. over 1898. Of the sulphate made last year 26,239,499 lbs. were produced as a by-product in the electrolytic refining of copper, and the metal contained in this sulphate is, therefore, added in the total figures above. The demand for copper sulphate, especially from abroad, has been very large in spite of the increase in prices, which followed those in the value of metallic copper.

Foreign Production.—There has been a fair, though not a very large increase in the production of foreign mines. On the American Continent, Canada shows a considerable gain in 1899, principally from the British Columbia mines, although there has been some also from the copper-nickel mines of the Sudbery District. In 1900 it appears probable that the increase will be still greater, as preparation has been made for working and smelting on a very considerable scale the copper ores of the Boundary District, in British Columbia, as well as those of the West Kootenay Division. In Mexico the Boleo Company has been a large producer and has made considerable additions to its operating plant. While little has been heard from the Inguaran Mines, it is understood that development work is proceeding actively and with success. From the minor Mexican producing districts there has been a considerable gain. In South America the Chilean mines have increased their imports, under the stimulus of high prices.

In Europe nearly all the well-known mines made a large output in 1899. The Rio Tinto Company is extending its operations and has ordered a large quantity of machinery of American manufacture for the addition of its plant in Spain. The Tharsis in Spain, the Mason & Barry in Portugal, and the Libiola in Italy, have all kept up their production. The Mansfeld in Germany shows comparatively little change.

The Cape Copper Company has worked its mines in South Africa to their full capacity and is developing a new deposit. In the early part of the year the Japanese Mines, especially the Ashio, produced well, and a considerable quantity of copper was exported from Japan, which has for some time past consumed nearly all its own production of copper, or sent it to China. About the end of September the Besshi Mine, the largest producer in the country, was completely drowned out by a sudden flood. At the same time the villages adjoining the mines, which were inhabited by the miners and laborers employed there, were also submerged, and more than 600 persons were drowned. The mine is in the Province of Iyo, in Shikoku, and has been for some time operated under lease by Mr. K. Sumitomo of Osaka. The production in 1898 was about 7,000,000 kin (4,200 metric tons) of fine copper. The restoration of the mine will take some time, as nearly all of the machinery was destroyed, and the shafts and underground workings submerged, while nearly all the skilled miners and laborers employed were drowned in the flood, and it will take time to replace them.

The New York Copper Market in 1899.

For years past fears have been entertained in some quarters that in consequence of the enormous increase in the production of copper, the supply would some day far exceed the demand, and this in spite of the fact that almost from year to year stocks have shown a decrease. This caused more conservative people to become more watchful to avoid their being caught napping and finding themselves without sufficient supplies.

The year 1898 closed with a firm tendency and at practically the highest prices of that period, but it was not until early this year that infallible signs arose of consumption being practically larger than production; and stocks, already very small, had to be drawn upon to such a degree that an upward movement in values was no more than natural.

Not only had the regular trade in all its different branches showed improvement, but in addition there were large orders given out by the various governments for shipbuilding, and some of the telegraph and telephone companies placed specially large orders for conductivity wire. Thus there came a day when producers and refiners found themselves sold ahead for some time and unable to meet the additional demand which still prevailed.

Peace negotiations between the United States and Spain having come to a satisfactory conclusion, and the country itself, in consequence of abundant crops, being in a prosperous condition, money became very cheap and credits were freely given, all of which gave additional stimulus to an upward movement which soon set in with full force and continued until late in the fall, bringing prices up to a level which had not been seen for a number of years; and was then mostly due only to unsound speculation, which soon died out, so that similar periods were more or less short lived.

That speculation helped matters along in the present instance, goes without saying, but if some parties—and there were many, especially in Europe—maintained that this was the only means of bringing prices up to their high level, they were sorely mistaken, and it is only just and fair to say that the upward movement was the direct consequence of an extraordinary demand which could not be satisfied. Had it not been so and had not the trade been compelled continually to remain in the market as heavy purchasers, the high values would surely not

have lasted as long as they did; and throughout the year there was a continued scarcity of spot copper, which, in several instances, was so marked that a considerable premium could be obtained for the same over more distant delivery.

It has often been urged that whenever a product like copper rises too high in values it will have two effects, to stimulate production and curtail consumption; and while this will, in general, always remain true, in extraordinary times such as we have passed through during the past twelve months, additional facts will arise, which, to a certain extent, will upset standard rules.

We have often pointed out before that an increase in the production of copper can only come about slowly and that existing large producing mines will not continue forever; and the truth of this has this year been very largely demonstrated. It is true the high level of prices has launched a number of enterprises which, while individually not producing a great deal, have aggregated considerable quantities. These have, however, been very largely offset by the short production of some of the larger producing mines, and the total increase for the year, in spite of the very tempting prices, is not more than the regular average during the last 10 years.

On the other hand, manufacturers have been so busy, building has been going on to such a large extent, the requirements for electrical purposes, for shipbuilding and railroad construction have been so large that the higher prices no longer proved a serious obstacle to consumption.

Sooner or later this will and must alter, and while at the end of the year a slight falling off in consumption is noticeable and has already told on the high prices established previously, consumption in general is still going on at so satisfactory a rate that it will take some time before a larger production will more than offset the consumption and bring prices back to the level which we have been accustomed to.

When making comparisons of prices, one has now also to take into consideration the increased costs of material. Fuel and all raw materials, as well as wages and freights, are higher, and as long as the present activity lasts they are likely to continue so. Higher selling prices are therefore justified, provided that the profits of the industry are not seriously curtailed.

Whatever the future may bring forth, it can be confidently stated that consumption is likely to remain eminently satisfactory, and that the prosperity of the last few years in the copper industry will continue for some time to come, unless opposing factors should arise (which, however, cannot now be foreseen) that might interfere with the natural course of events.

The mining industry has been largely fostered and for a time new propositions came out almost daily. It is unnecessary to say that a great number of them were worthless, or nearly so, but there cannot be the slightest doubt but what a good many others possessed great merits and will continue as regular producers, even if a low level of values should be permanently established, of which there is at present no sign.

Copper shares on the whole, especially during the first half of the year, showed enormous advances, which were partly justified by the higher prices obtained for the product, but were mainly due to the speculative fever prevalent throughout the world and the desire on the part of large capitalists who had not so far been interested in metals, but who all at once displayed a tendency to become dominating factors, attempting to concentrate the production of the United States in their hands.

This did not prove an easy matter. Nevertheless they succeeded in getting under their control a heavy percentage of the output, though far from a controlling interest. The fears entertained at some time or another by the larger consumers that they might have to submit to the dictation of a few large capitalists have so far been groundless, and it is to be hoped, in the interest of the entire industry, that it will remain so.

Special efforts were made to get the entire output of Montana concentrated in the hands of one strong concern, but even these efforts were foiled by two large and important factors remaining out and preferring to act independently.

In a similar way the largest producers of the Michigan copper district refused to part with their holdings and have also remained independent. In addition, a large number of the new concerns are either already producers or promise to become so at an early date, and these also intend to stay outside of any combination or have not been considered important enough to be invited to join.

The main output of Arizona we find centered in two financially very strong concerns, both of which are admirably managed, and these also do not show any desire for a change. Besides, there are a number of producers scattered all over the United States, of which the majority are in a prosperous condition and of which control could be obtained only by paying prices far above the actual value of the properties.

Owing to these peculiar circumstances, the tendency noticeable in a great many other industrial enterprises to create large trusts such as dominate their respective industries, has not been so successful with respect to copper. It was not possible to get hold of this industry in the same way as the lead smelting and refining industry, the iron and steel trade, sugar, leather, etc.

That during a time when consumption was so large and the requirements of the trade almost unprecedented, the copper business and its allied industries were in a prosperous condition, needs scarcely any mention. Nevertheless, when manufacturers saw that they might suffer if the products of the country were controlled by a very few, some of them took steps to guard against such a state of affairs, and a number of concerns who had hitherto made competition for each other consolidated, mainly with a view to being able to show a more powerful resistance to the producers. The outcome of all this is that the trade to-day, as compared with twelve months ago, is of an entirely different character, but it will take some time to judge if the change has been for the better or the worse.

Exports to Europe have been irregular, but in the main satisfactory; during the last few months the somewhat curious movement has been experienced of Chile bars stored in English warehouses being shipped to the United States refineries for treatment by electrolysis, while the refined copper is to be re-exported to Europe. This demonstrates very clearly that our home refineries are worked to considerably better advantage than those in Europe.

Last December lake copper closed at 13¼ and electrolytic at 13@13½, but quite early in January a very active trade prevailed, and with simply enormous transactions during the entire month, prices advanced almost from day to day, until, by the end of the month, 16c. for lake copper and 15½ for electrolytic was firmly established; and the month of February did not remain far behind this phenomenal record, bringing the price up to 18c. for Lake and 17@17¼c. for electrolytic.

March then brought a slight reaction, and prices for the month fell off about ½c. But this retrogressive movement did not continue long, and April brought prices up to the highest levels established in January, especially values for Lake copper, 18½c. being freely paid, and in some instances sales were even made at 19c., while electrolytic copper ruled at 17¼@17½c.

Towards the end of May a slight easing off again took place and continued throughout the month of June, causing a decline of ¼@¾c., but in July manufacturers found themselves compelled again to enter the market and purchase heavily. Besides, the Europeans, who had for some time refrained from buying to any extent in this market, were at last forced to replenish their depleted stocks.

Slowly, but steadily, values again advanced to 18½ for Lake and 17½@17¾ for electrolytic copper, which values were firmly maintained during the summer months, August and September showing hardly any change.

With the beginning of October matters changed. The outbreak of the war between England and the Transvaal unbalanced trade. Money rates advanced and the bank reserves became smaller and smaller, all of which affected trade in general unfavorably.

It will have been noticed that between Lake copper and electrolytic rather a wide margin had been established, while formerly the difference between the two descriptions rarely exceeded ¼c. During this year, however, the margin widened to 1c. and even 1¼c., or a little more. The reasons for this are somewhat difficult to explain, except that at a certain time earlier in the year Lake was in specially large demand, while orders for electrolytic copper, which is now being produced in enormous quantities, were more eagerly competed for. Producers of Lake were evidently for some time under the impression that this difference could be maintained, and, waiting for the trade to approach them, they accumulated some stocks, while electrolytic copper was delivered to consumption as fast as produced.

The first pressure, therefore, came from the producers of Lake copper, and when it was found that the largest producer of this description was ready to sell a big quantity of copper, consumers became extremely shy, and negotiations were pending for some weeks before a large sale was consummated, which proved then to be a cut from 18½ down to 17c. for delivery up to the end of March, 1900, with the condition that the selling company guarantees its own price against a decline. This large reduction startled the trade and some of the smaller Lake producers evidently were under the impression that they might be able

AVERAGE MONTHLY PRICES OF LAKE COPPER IN NEW YORK.

Year.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
1895.....	10.00	10.00	9.75	9.75	10.25	10.63	11.25	12.00	12.25	12.00	11.00	10.50	10.75
1896.....	9.87	10.64	11.03	10.98	11.15	11.67	11.40	10.98	10.66	10.66	11.23	11.28	10.88
1897.....	11.75	11.92	11.80	11.48	11.03	11.11	11.11	11.16	11.30	11.13	10.88	10.78	11.29
1898.....	10.99	11.28	11.98	12.14	12.00	11.89	11.63	11.89	12.31	12.41	12.86	12.93	12.03
1899.....	14.75	18.00	17.54	18.43	18.25	17.93	18.33	18.50	18.46	17.76	16.93	16.40	17.61

to realize somewhat better prices, but in this they failed, and it was already in November that sales were made slightly below that figure. Though electrolytic copper did not decline in the same proportion, sales were made at 16½c.

In the beginning of December matters became worse. The war in South Africa took an entirely different turn from that which had been anticipated. Instead of the English making rapid progress, they experienced one reverse after another, and were compelled to send strong re-enforcements from the home country. Money rates advanced more and more, and at about the middle of the month financial centers experienced a panic more severe than at any time since 1893. Inflated prices of all industrials suffered tremendously and copper stocks shared the same fate. All this naturally reflected on the prices of the different metals, and some sales were made at 16¼ for Lake and even at 16c., while of electrolytic copper sales were made at 15½ at 15¼.

The London Copper Market in 1899.

The opening of 1899 marked an important era in the history of the Copper Market, being the commencement of a great upward movement which brought prices to a level unparalleled since 1889 and which has been practically maintained throughout the year. The strong advices which were coming from America toward the close of last year continued to pour in and played a prominent part during the first few weeks of the new year. The quotation for Lake copper rose from 13.25 to 18c., and there were talks of a combination of some of the largest copper producing companies in America, which, however, received comparatively little credence at this stage. The real strength of the market lay in the enormous consumptive demand, which was coupled with an ever growing scarcity of metal, especially refined sorts, and a great wave of speculations led on by the Americans.

Statistics published early in the year showed the world's supply of copper during 1898 as 424,126 tons, being an increase of over 26,000 tons

on the previous year, but the stocks were rapidly diminishing and at the end of the first fortnight there was already a decrease in the visible supply of 1,318 tons.

The turnover in the London market was enormous, being no less than 59,000 tons for the month of January. The speculative element was very strong, business exceedingly lively, and options were freely dealt in. The price of standard copper at the opening was £57 17s. 6d. cash and £58 5s. three months, but large purchases drove up the market steadily and in spite of some temporary reactions, brought about by realizations, a gain of £5 was recorded by the 20th. A prominent feature toward the close of the month was the covering of old bear sales, falling due in February, which produced a scarcity of cash copper and established a temporary backwardation. The closing figures were £69 16s. 3d. cash and £69 15s. three months—a remarkable advance on the opening figures. India and the East began by sending good enquiries and orders for yellow metal and copper sheets, but the high prices had the effect of practically stopping these.

February brought no abatement in the excitement. The high prices drew out some large selling orders which caused heavy fluctuations but did not stem the upward current, which received a new impetus from further excited purchases. When the high figure of £74 10s. cash had been reached, however, the market became top-heavy and collapsed about £4, but quickly recovered to £73, every decline at this time offering new temptation to buyers. The ultimate effect of such heavy fluctuations, however, was unsettling and business became less active, the month closing at £71 15s. cash and £71 11s. 3d. forward.

About this time efforts were being made to increase the production of copper, and makers of mining and engineering plants were reported to be extremely busy, but it was long before the effect of these efforts could be felt. Trade generally became quieter and manufacturers were withholding orders on account of the high prices. America was an eager buyer and even repurchased good quantities previously sold to Europe.

In the beginning of March the total visible supply of copper was the lowest on record, 24,326 tons, having decreased further by 1,500 tons during the latter half of February. The fluctuations in prices continued and were remarkably sharp compared with the extent of the turnover, be a covering on the one hand and large profit-taking on the other making the market very sensitive; £72 for three months and £72 8s. 6d. cash were the opening figures, but they were not maintained, and the downward tendency was assisted by an unexpected increase in the stocks of 4,171 tons for the month. When £66 7s. 6d. had been touched there was a sudden rush of buying orders, chiefly for American account, and as much as £3 was gained in a single day, the close being firm at £70 for cash and three months. Business with consumers was restricted, the high prices discouraging new orders, while the demand for manufactured articles was practically nil.

Notwithstanding a further increase in the visible supply of 2,614 tons for the preceding fortnight, April opened with still higher prices, the large purchases by American operators being renewed with great energy. The bears also began to cover and prices rose from £70 10s. to £72 5s. at the first session. After a temporary reaction, caused by the publication of the statistics, a new demand set in and speculation became very excited. Some heavy buying of near dates caused a backwardation on forward copper which at one time reached 30s. Bear covering continued on a large scale, as did also the strong buying on behalf of the American clique, who were forcing up the market. The intentions of the latter party were somewhat criticised, and certain people, who doubtless had in mind the French combination of 10 years earlier, predicted a heavy fall. But, unlike the French party of 1889, this American movement had enormous funds behind it, and, what was more important, very good trade conditions. Toward the close of the month the record figure of £78 for standard copper was reached, in an exceedingly lively market. Rumors of an American combination of producers were again rife and caused considerable excitement in the copper share market, though they lacked confirmation.

May, however, brought the expected confirmation of these rumors, and the formation of the Amalgamated Copper Company of New Jersey, with a capital of \$75,000,000, was announced. It was said that American holders then controlled the whole available stock of standard copper. Business became restricted and prices fell off from £77 10s. to £75 10s. Three months copper was neglected and sold as low as £2 under cash metal, but this backwardation was soon reduced to 5s. About this time American and English prices were almost on a level, making possible some export business in American electrolytic copper, but there was little new speculative business and the turnover was small. The prices ruling at the close were about £76 10s. cash and £76 5s. forward. With the lull, consumers began to cover their requirements, but they were by no means reconciled to the high level of prices and bought only from hand to mouth. The statistical position helped to keep down the market, the visible supply being increased by 3,627 tons for the month. A decline in the copper share market also contributed to depress prices.

With the opening of June, the commencement of troubles in the Transvaal, as well as political unrest in Paris, tended somewhat to deter speculation, which was very quiet at this time. American support became half-hearted and values dropped from £76 to £74 16s. 3d. for cash. The statistics, which showed a further large increase for the latter half of May, also had a depressing effect. The supplies for this period were 11,491 tons and the deliveries 8,492 tons. For a time it seemed as if the American support had been withdrawn entirely, but the lower prices at this time began to attract the attention of consumers, who had run themselves very low and were obliged to buy fair quantities for prompt delivery. At the same time cheerful reports of a good consumptive business in America began to come forward. The statistical position also improved and the tendency of all the markets became firmer at the close of the month, when values stood at £76 17s. 6d. cash, with forward copper about 1s. 3d. less. Lake copper was quoted at 18c. and a good business in electrolytic copper was reported.

The chief feature of July was the renewal of confidence in the market shown by both consumers and speculators, who were encouraged by the upward course of the markets in other metals. The former, especially, became quite regular in their demand and the state of trade generally at this time was prosperous. In America great activity prevailed in all branches of the trade. Producers were sold out for some months ahead and began to hold for higher values. Large quantities of electrolytic copper were sold and wire drawers were extremely busy. All this had a good effect on our market. The European demand emanated chiefly from Germany, but England and France also bought, and a fair order for fine copper was placed by the British Government. Speculative business, however, was comparatively small, operations being restricted by a tightness in the money market and the unsettled state of politics. This caused sales of cash warrants and a contango of 12s. 6d. on three months copper was established. The attitude of America, nevertheless, remained bullish and values, on the whole, underwent but little change, the prices paid at the close of the month being much the same as at the opening, £76 7s. 6d. cash and £76 17s. 6d. three months. The European production of copper showed an increase of 2,749 tons for the first six months of the year, while American production increased 4,000 tons for the same period.

The simultaneous arrival of two large cargoes of copper, together with increased shipments from Chile, and other countries, produced, in the beginning of August, quite a sensational statistical position, the increase in the supplies for the fortnight being as much as 4,500 tons. Prices suffered in consequence, but the strong support of the American operators acted as a counter influence, and the net loss was but slight, cash copper quickly recovering from £75 11s. 3d. to £76 5s. Speculative business afterward became extremely quiet, some sessions passing without a single transaction, but on the other hand there was no desire to sell in face of the strong American reports, and prices improved. Lake copper was quoted at 18.50c. at this time, and for electrolytic copper 17.75c. was paid. Consumption in Europe was very good, and large sales were made to Continental buyers even as far forward as December. All these conditions, together with an utter famine in electrolytic copper, both in England and America, strengthened the market, and values improved at the close to £76 18s. 9d. cash and £77 3s. 9d. three months, with a very small turnover.

September was more or less disturbed by political troubles in the Transvaal, which considerably depressed stocks, and these, as usual, reacted to some extent upon the metal markets. American support was absent at this time, as far as new purchases of warrants were concerned, but they still showed their determination to put up prices by exporting large quantities of Chile bars from England to the United States. The extreme scarcity of electrolytic copper was also largely responsible for these shipments, as the intention was to convert the copper into electrolytic and reship the bulk of it to Europe. The primary effect of them, however, was that of a serious depletion of the available supplies. The activity in the wire trade at this time was almost phenomenal and all the cable manufacturers were flooded with orders. Toward the end of the month, however, American consumers had pretty well covered their requirements till the end of the year, and electrolytic copper was a little more obtainable. The War Office placed an order for 300 tons of fine copper, but Continental consumers held off somewhat, awaiting political events. Prices of standard copper varied but slightly until the end of the month, when dearer money brought out a more plentiful supply of cash copper and caused a drop of 20s. The closing values were £75 11s. 3d. cash and £76 2s. 6d. forward.

The effect of the large shipments of Chile bar copper to America made itself felt in the beginning of October, when the supplies showed a decrease of 3,199 tons for the preceding fortnight, making 4,061 tons for the month. The attitude of the trade toward this new American move, however, became one of suspicion, as it was seen that consumers were being forced to pay unnaturally high prices, and the result was the latter pursued a strict hand-to-mouth policy. A further decrease of 2,164 tons was shown in the middle of the month, the deliveries including 2,275 tons shipped to America. It then became clear to most people that the position was an unnatural one, and prices actually dropped 20s. in one week, the effect of the higher Bank rate being apparently greater than the statistics. The truth was that most people were no longer misled by the figures and recognized that the large decrease simply meant a transfer from England to America of copper that would sooner or later find its way back. This may have been partly the cause of a sudden weakness which showed itself in the American market at this time and was proclaimed throughout Europe by cheap offers of electrolytic copper, which were eagerly taken up. The Lake companies reduced their prices considerably, causing a great sensation among holders who hastened to clear out. The bears, seeing their opportunity, fought against some renewed American support, and worked prices down to £72 17s. 6d. cash, but steady purchases on the part of dealers prevailed in the end, and £74 12s. 6d. three months was paid. When they had done, however, renewed selling caused a weaker market again and the ground was all lost, £72 15s. cash and £73 three months being accepted at the close. This renewed activity was a strong contrast to the extreme dullness of the previous weeks. The reserved attitude of consumers was strictly maintained during this period, but in America large quantities of Lake copper were disposed of at 17c.

In November the bears continued their selling operations, with everything in their favor, viz.: The continued weakness of the American market, alarming news from the Transvaal and an increase of 640 tons in the supplies. Prices gradually receded to £72 cash, but strong support was then forthcoming in the shape of a sudden rush of buying orders, which once more turned the scales. In a general desire to buy, higher values were cheerfully paid, until £74 15s. had been reached. The demand, however, was confined chiefly to cash warrants, which were held firmly, with the result that a premium of nearly 20s. for this position was momentarily established. When prices had begun to droop again, the mid-monthly statistics, showing a decrease of 1,276 tons, infused a fresh element of vigor into the market and £75 2s. 6d.

was reached, the turnover being large. This, however, did not stop the American offers of cheap electrolytic copper, which continued to come in freely, and a fair consumers' business was done with America, the English producers remaining firm.

This was followed by a period of inactivity, with cash copper scarcer than ever, the Americans practically controlling the whole stock. Consumers bought for immediate requirements only, and some makers' brands were obtainable as cheaply as spot standard. Prices touched £72 17s. 6d., but at the end of the month the rise in the Bank rate to 6s. contributed to a weaker tendency and brought out a little more cash copper. The decline was sharp and the close of November weak at £73 12s. 6d. cash and £73 forward.

December was fraught with depressing influences, the chief of which were the failure of a broker who had large commitments, chiefly in tin, but also in copper, and the British reverses in South Africa. Prices declined further, and owing to continued stringency in the money market the backwardation on three months copper increased to 40s. American offers continued to come in pretty freely, and the speculative interest in the article diminished considerably. Some realizations took place and spot standard touched £72 5s., but with a little more demand toward the close of the month, £72 12s. 6d. was paid, and three months copper was quoted about 40s. less.

Later on the German Bank rate was raised to 7 per cent., and the French Bank rate to 3½ per cent., with a prospect of 7 per cent. in England. There was quite a rush to realize, and notwithstanding continued American support, standard copper dropped to £67 for cash and forward. During the closing days of the year a somewhat better feeling prevailed, and £70 was again established, with the outlook more reassuring than it had been for a considerable time past.

GOLD AND SILVER IN 1899.

We are enabled at this early date to give what we believe to be a very close estimate of the gold production of the world in the year 1899. The figures have been secured from official sources as far as possible, and by a free use of the cable from foreign countries. The figures for the leading countries are given in the accompanying table, comparisons being made with the corrected figures for 1898, as given in the "Mineral Industry."

In 1898 the production of gold in the world reached a total of \$289,147,779. In 1899 this great total was again exceeded, our table showing that the production amounted to \$313,954,468, the increase being \$24,806,689.

A still larger result would have been attained in 1899 had it not been for the almost total stoppage of gold mining in the Transvaal by the unfortunate war with Great Britain. Had work continued there without

GOLD PRODUCTION OF THE WORLD.

Countries.	1898.			1899.		
	Fine Ounces.	Kilo-grams.	Value.	Fine Ounces.	Kilo-grams.	Value.
North America:						
United States.....	3,148,642	97,932.9	\$65,082,430	3,506,679	109,069.0	\$72,483,055
Canada.....	662,796	20,613.9	13,700,000	872,227	27,159.9	18,049,593
Newfoundland.....	3,000	93.3	62,010	3,000	93.3	62,010
Mexico.....	398,487	12,393.5	8,236,720	448,783	13,959.3	9,277,351
Central America.....	25,399	789.9	525,000	25,399	789.9	525,000
South America:						
Argentina.....	15,235	473.8	314,907	15,235	473.8	314,907
Bolivia.....	16,076	500.0	332,300	16,076	500.0	332,300
Brazil.....	122,481	3,809.3	2,531,687	122,481	3,809.3	2,531,687
Chile.....	68,102	2,118.0	1,407,623	68,102	2,118.0	1,407,623
Colombia.....	179,003	5,567.3	3,700,000	179,003	5,567.3	3,700,000
Ecuador.....	6,405	199.2	132,400	6,405	199.2	132,400
Guiana (British).....						
Guiana (Dutch).....	184,526	5,739.0	3,814,150	185,511	5,770.0	3,844,962
Guiana (French).....						
Peru.....	9,958	309.7	205,827	9,958	309.7	205,827
Uruguay.....	1,863	57.9	38,506	1,863	57.9	38,506
Venezuela.....	39,384	1,224.9	814,067	39,384	1,224.9	814,067
Europe:						
Austria.....	2,174	67.6	44,927	4,995	153.5	102,000
Hungary.....	98,645	3,068.0	2,028,993	98,645	3,068.0	2,028,993
France.....	8,874	276.0	183,430	8,874	276.0	183,430
Germany.....	91,539	2,847.0	1,892,116	95,711	2,976.9	1,978,353
Italy.....	10,160	316.0	210,014	10,588	329.3	218,862
Norway.....	498	15.5	10,301	498	15.5	10,301
Russia.....	1,196,624	37,217.0	24,734,418	1,164,608	36,220.8	24,072,344
Spain.....	13,279	413.0	274,480	13,279	413.0	274,480
Sweden.....	3,643	113.3	75,299	5,144	160.0	106,318
Turkey.....	386	12.0	7,975	386	12.0	7,975
United Kingdom.....	1,354	42.1	27,980	314	9.8	6,495
Asia:						
China.....	321,293	9,992.8	6,641,190	321,293	9,992.8	6,641,190
India (British).....	375,704	11,684.9	7,765,807	411,106	12,786.7	8,498,571
Japan.....	34,509	1,073.3	713,300	34,509	1,073.3	713,300
Korea.....	52,927	1,646.1	1,094,000	52,927	1,646.1	1,094,000
Malay Peninsula.....	25,000	777.5	516,750	25,000	777.5	516,750
Borneo.....	4,838	150.5	100,000	4,838	150.5	100,000
Africa:						
South African Republic.....	3,777,009	117,470.3	78,070,761	3,536,945	110,010.4	73,108,650
Rhodesia.....	20,981	652.5	433,682	53,747	1,671.7	1,110,953
West Coast.....	34,845	1,083.7	730,248	34,845	1,083.7	730,248
Madagascar.....	19,352	601.9	400,000	19,352	601.9	400,000
Australasia, 7 cols.....	3,013,763	93,732.3	62,294,481	3,777,559	117,494.3	78,082,171
Totals.....	13,988,767	435,075.9	289,147,779	15,175,184	472,025.2	313,954,468

(c) As reported by the Lima mint.

interruption, there would have been nearly \$20,000,000 to add to our report. In that case the Transvaal would have held the first place as a gold producer; as it is, it yields that position to Australia, but still holds the second place, the United States being third in order, with a total of about \$600,000 below the South African Republic. Russia still holds the fourth place, while Canada, which has made great advances,

is fifth, and Mexico sixth. These six countries produced in all \$285,735,241, or over nine-tenths of the total.

United States Production.—The total production of gold in the United States, as shown above, amounted to \$72,483,055, an increase over 1898 of \$7,400,625, or 11.4 per cent. While it is impossible at present to separate this production by States with accuracy, we can say with certainty that Colorado holds the first place by a considerable amount, while California is second in rank, South Dakota is probably third, and Alaska fourth. In Colorado an increased production was due chiefly to the large outputs of Cripple Creek and Leadville, which are shown in detail by the reports from our special correspondents given below. In California there was a general increase, fairly well distributed throughout the State, the advance being largely due to the better supply of water following the two dry years, 1897 and 1898. This enabled a more extended working of the mines.

In South Dakota the State Mine Inspector's report for 1899 gives the following figures: Homestake, \$2,674,336; Highland, \$936,000; Horse-shoe, \$562,100; Holy Terror, \$900,000; Hidden Fortune, \$200,000; Golden Reward Chlorination Works, \$648,000; Blacktail Mines, \$60,000; Golden Reward Smelter, \$2,300,000; Rapid City Chlorination Works, \$24,000; Allen, Small & Association, Cyanide Plant, \$19,000; Spearfish Cyanide Plant, \$63,000; J. R. Mill, \$6,000; Central City Cyanide Plant, \$8,000; Crockran Mill, \$9,000; placer mones, \$10,000; other mines and mills, \$10,000; ore shipped East, \$70,000; total, \$9,131,436.

In Alaska there was a considerable production from the old mines on Douglas Island, while a largely increased output came from the placers of the American Yukon, the total amounting to over \$2,000,000. In addition to this there was an output, estimated at at least \$3,000,000, from the newly discovered placers in the neighborhood of Cape Nome, on the seacoast. In Montana and Idaho, in the Northwest, and in New Mexico and Arizona, in the Southwest, there were no changes of special importance.

Canada.—This country now holds the fourth place and is becoming a gold producer of much importance, chiefly owing to the large production from the Klondike and other mines in the Yukon Region, which amounted this year to about \$14,000,000. The total production of Canada in 1899 was \$18,049,593, showing an increase over 1898 of \$4,349,593, or 31.7 per cent. In addition to the Yukon gold there was an increase from British Columbia and some also from the mines of Western Ontario, while there was a small decrease from the Nova Scotia mines.

Mexico.—The production of Mexico amounted to \$9,277,351, the largest ever reported, and exceeded that of 1898 by \$1,040,631, or 12.8 per cent.

The total production of the three great North American gold mining countries thus amounted, in 1899, to \$109,809,999, or over one-third of the world's total.

Russia.—This country, which includes the Siberian provinces, is the only important European gold producer, and it still retains its position as fourth in rank. The total reported for 1899 is \$24,072,344, a decrease of \$662,074, or 2.7 per cent. This is the only important gold producer which showed any falling off in its production last year.

In Asia the only large producer, outside of Siberia, which is given with Russia, is the Colar District in India, which has shown a steady gain for several years past. With the opening of Manchuria to the Russian, it is probable that a considerable production will come from that region; but its development will take some time.

Transvaal.—For the nine months ending with September, the gold production of the Transvaal showed a total of \$69,516,973, and the total for the year would probably have been not far below \$90,000,000, as each succeeding month up to September showed a considerable gain. The war, however, put an abrupt stop to production, and although a few mines have since been operated by the Government for its own use, their production for the three months from September to December was very small. Making allowance for this output, we find that the total was as given in the table, showing a decrease of \$4,962,108 from 1898.

Australasia.—The seven colonies of Australasia made remarkable advances, their total output in 1899 being \$78,082,171, an increase of \$15,737,690, or 25.4 per cent., over the preceding year. The greater part of this gain came from Western Australia, but there was an increase in all the other colonies, which was large in Queensland and Victoria, and very considerable also in New Zealand. With improvements in the metallurgy of the somewhat refractory ores of the Kalgoorlie District in Western Australia, a still further increase may be looked for in 1900.

Silver Production of the United States.—The silver production of the United States was about 63,000,000 oz., showing an increase of about 4,000,000 oz. over 1898. There was also, as usual, in addition to this, a large production of silver made in the United States from imported ores and bullion.

Silver in Mexico.—The silver production in 1899 was 1,791,174 kgs., an increase of 22,771 kgs. over 1898.

Commercial Movement of Gold and Silver.—The exports and imports of gold and silver in the United States are shown in the following table:

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

Metal.	November.		Year.	
	1898.	1899.	1898.	1899.
GOLD.				
Exports	\$913,467	\$264,310	\$14,975,316	\$33,521,900
Imports	5,324,601	2,904,043	149,408,770	45,714,718
EXCESS SILVER.				
Exports	\$4,411,134	\$2,639,733	\$134,431,454	\$12,192,818
Imports	4,023,079	4,439,166	47,969,406	47,860,823
Exports	2,269,259	2,772,360	25,921,927	27,818,150
EXCESS GOLD.				
Exports	\$1,753,820	\$1,666,806	\$22,047,479	\$20,042,673

In December there was an outward movement of gold, the total ap-

proximating \$15,000,000, caused by the demand for money in London and the stoppage of supplies from South Africa.

Generally speaking, the United States has largely increased its stock of gold during the year, retaining practically all of its own large production. The Treasury Department's estimates make the quantity of gold coin in the country the largest ever recorded.

The silver market has been comparatively uneventful during the year. There was an increased demand from the East, especially China. Prices showed a rather narrow range, the highest monthly average being 61.23c. an ounce, in May, and the lowest, 57.98c., in October.

Average Prices of Silver per oz. Troy.

Month.	1899.		1898.		1897.	
	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.	Lond'n Pence.	N. Y. Cents.
January...	27.42	59.36	26.29	56.77	29.74	64.79
February..	27.44	59.42	25.89	56.07	29.68	64.67
March.....	27.48	59.64	25.47	54.90	28.96	63.06
April.....	27.65	60.10	25.95	55.02	28.36	61.85
May.....	28.15	61.23	26.31	56.98	27.86	60.42
June.....	27.77	60.43	27.09	58.61	27.58	60.10
July.....	27.71	60.26	27.32	59.06	27.36	59.61
August....	27.62	60.00	27.48	59.54	24.33	54.19
September	27.15	58.89	28.05	60.68	25.66	55.04
October...	26.70	57.98	27.90	60.42	26.77	57.57
November	27.02	58.37	27.93	60.60	26.87	57.93
December.	27.21	58.99	27.45	59.42	26.83	58.01
Year....	27.44	59.58	26.76	58.26	27.55	59.79

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

The average price for the year at New York was 1.32c. an ounce higher than in 1898, and 0.21c. lower than for 1897.

California Mines in 1899.

By Our Special Correspondent.

A review of mining operations in California for the past year shows a very prosperous condition of affairs, with a marked extension of operations in the more northerly and southerly counties of the State. While the yield of gold will undoubtedly show a considerable shortage owing to the prolonged drought along the Mother Lode, which caused many productive mines to close down for an unusually long period, it is satisfactory to know that the falling off will be more than made up during the coming year should the rainfall continue as heavy during the balance of the season as up to date. From present indications 1900 will prove one of the most prosperous years ever known in the mining industry of the State.

A large amount of prospecting in quartz has been carried on in Siskiyou and Trinity Counties, which hitherto have been sadly neglected by mining men, principally because transportation has been hampered by the lack of railroads and the peculiarly rugged nature of the country. Results, however, of late have aroused an enterprising spirit among prospectors, and surprising activity is reported in the vicinity of mines which have proven rich beyond expectations. A number of fine properties have recently been opened up around Yreka, in Siskiyou County, also in the district along the river in Trinity County. From Carrville, in this vicinity, a rich belt of sylvanite ore has been traced for a distance of 60 miles in a northerly direction, and some phenomenal strikes have been made where sinking has been carried on to any depth. Among the more productive of these mines mention may be made of the Yellow Rose of Texas, Forget Me Not, Strode, Golden Jubilee and Wagners.

In Trinity County gravel mining is still a leading industry, and quite a number of such properties have been put in good condition for operation on a more extensive scale as water becomes available for washing. A number of cement propositions have been taken up by Eastern and local capitalists, who have invested considerable money in new and improved plants for handling a large quantity of material which prospects well in gold.

In the Grass Valley and Nevada City districts work is as active as it ever has been. Well-known mines, such as the Champion, Providence, W. Y. O. D. and Pennsylvania, are enlarging their operations all the time, and shareholders continue to reap a golden harvest. Work is about to begin again at the old Idaho Mine under a new company, which will try to locate a new ore shoot that may prove as profitable as that which the original owners followed down nearly 3,000 ft. before they retired with a fortune estimated in the millions. The drift mines on the Forest Hill Divide continue to yield large returns, the Hidden Treasure, one of the finest appointed properties of its class in the world, holding the lead in gold production. The old and rich Morning Star Mine has changed hands and will be worked for low-grade gravels. The rich streak on the bedrock, which has produced many thousands of dollars, has been worked up to the ground of the Big Dipper Mine adjoining, where it is to be hoped it will be taken up again. In this vicinity the Eureka Consolidated Drift Company is spending a large amount of money driving for the bedrock in the channel cut some time ago, and a connection is looked for at any moment.

Along the Mother Lode work is very active. In Calaveras County the big Utica Company, at Angels Camp, has its large electric power plant in full operation, furnishing power to the mines and mills thereabouts. At this mine 180 stamps are dropping. The Lightner Mine is running 40 stamps. At the Angels development is being pushed and the first clean up of bullion was made at the beginning of November. The Big Bonanza Mine, one mile southeast from Angels, has a shaft down 340 ft., the showing improving as depth is attained. The same bright prospects are reported at the St. Lawrence Mine, now being opened at Albany Flat.

Development work on the Albany or Chapparral Hill mines goes on with vigor, with the most flattering indications. At Carson Hill the Melones Consolidated is driving in a large tunnel as rapidly as possible toward the center of the hill to open up the veins there. The completion of the 120-stamp mill for this company (which is composed of

many Boston people) has been delayed on account of the bad wagon roads, rendering the delivery of lumber and machinery impossible.

The Sierra Railway, which is extending its road from Jamestown, Tuolumne County, to Angels Camp, Calaveras County, is putting a fine iron bridge across the Stanislaus River at Robinson's Ferry, and has 200 men grading between Jamestown and Angels Camp. It is expected that the road will be in good shape by next June. It will pass along the west slope of Carson Hill, then along Carson Creek and along the foot of Albany or Chapparral Hill to Angels Camp. On the Mokelumne River dredging has been carried on with very satisfactory results.

Amador County mines are in a highly flourishing condition, with a number of old-time mines coming rapidly to the front again. Vastly improved conditions have been attained during the year at the Oneida, Central Eureka, Lincoln and Keystone mines, and it is expected all will be soon on a bullion-producing basis. The Bunker Hill Mine at Sutter Creek is to be opened up again. In Tuolumne County the same activity is reported, especially in the vicinity of Big Oak Flat, Groveland and Soulsbyville, where eastern syndicates are developing valuable properties, such as the Mt. Jefferson, Accident, Draper and Mississippi mines, on a large scale; also in Mariposa, where the London Exploration Company has started development work on eight mines located on the Mariposa Grant, from which a great deal is expected. San Francisco capitalists are opening up the Persia Mine, north from Mariposa City, with most encouraging results. Another comparatively new property—the Buffalo—is producing some fine specimens of gold-bearing rock. The proposition now under consideration to conserve the water supply of the State, if carried into practical effect, will do much to build up the mining industry along the Mother Lode, and great hopes are based upon the results of work now going on to carry out the plans suggested at the recent conference held in San Francisco.

Copper prospects are being opened all over the State. The main producer is still the Mountain Company, at Keswick, Shasta County. A rival of this great concern is promised during 1900, at Copper City, in the same county, where extensive works are to be erected to handle the output from the properties purchased by De la Mar. Inyo County made a good showing of copper during the year and Los Angeles has a few properties which promise well for the future.

San Diego continues to furnish a large pro rata of the annual production and the yield this year will show a large increase now that the Golden Cross difficulties have been patched up and several new properties are in a condition to begin the production of ore.

Oil production is a new and important adjunct to the mineral resources of California. While the original discovery dates a long way back, it is only recently that the industry has received the necessary impetus to bring it to the front. New strikes are now being reported daily, and the coming year will witness a rapidly increasing production of all grades of oil. The bulk of the output will be suitable for fuel alone, but several of the northern districts will supply a fine grade of illuminating judging from the character of some recent discoveries.

On the whole, 1900 should, under ordinary conditions, prove a banner year in the records of the California mining industry, the inducements for safe and profitable investment being better than ever before in the history of the State.

Cripple Creek in 1899.

By Our Special Correspondent.

The past year in the Cripple Creek District has been a prosperous one. Though a few mines that were shipping a year ago are not now, a number of new ones have been opened and others have increased their output, so that the total production for 1899 shows a considerable increase over 1898. A number of serious hindrances have been met. Early in the year an unusual fall of snow, making impassable roads, retarded production. In June the smelter strike shut down most of the smelters of the State, thus limiting the market for smelting ore. This strike lasted about two months. In August the town of Victor was burned down and with it the Gold Coin shaft house and machinery, entirely stopping the production of that mine for some time. During the past 2 or 3 months the production of milling ore has been somewhat curtailed owing to the lack of treatment facilities.

The production for the year amounted to 396,619 tons of the total value of \$15,662,400. Of this 115,490 tons, of the value of \$66.85 per ton, making \$7,720,506, were treated by the smelters, and 281,129 tons of the value of \$28.25 per ton, making \$7,941,894, were treated by the chemical mills.

The following table gives the tonnage of the ore for each month:

Months.	Smelting.	Milling.	Total.
	Tons.	Tons.	
January	9,472	22,174	31,646
February	8,015	20,241	28,256
March	7,966	25,936	33,902
April	7,674	22,497	30,171
May	8,072	27,449	35,521
June	6,400	24,461	30,861
July	4,669	22,324	26,993
August	7,750	22,569	30,313
September	12,926	23,571	36,497
October	11,866	24,495	36,361
November	15,680	22,912	37,592
December	15,000	22,500	37,500
Totals	115,490	281,129	396,619

It will be noticed that the heaviest tonnage occurs in the last four months of the year, these showing a great increase in the smelting ore. The value of the milling ore per ton shows an increase over 1898, \$28.30 per ton, as against \$24.95. This is probably because during the smelter strike the mills treated higher grade ore than usual, and on account of the limited facilities for handling mill ore the lower grade has not been marketed. Of the milling ore 101,911 tons, of the value of \$2,248,950, were treated by the Metallic Extraction Company's works at Florence, 92,280 tons, of the value of \$3,244,720, were treated in Colorado

City by the Colorado-Philadelphia Reduction Company. The El Paso, at Florence, also treated 42,000 tons, of the value of \$1,700,000. The rest of the ore was treated by the National Extraction Company's mill at Florence, the Arequa Mill at Elkton, the Gillette Mill at Gillette, and the Brodie at Mound City. The National did not commence operations until about the middle of the year. The Gillette closed down in July and the Brodie in March. The smelting ore was treated at the three smelters in Denver and the three in Pueblo, with a little ore going to Leadville and Kansas City.

The following table gives the total production of the district since the beginning:

1891	\$2,300	1896	\$8,499,300
1892	585,010	1897	11,500,000
1893	2,010,367	1898	14,100,000
1894	3,250,787	1899	15,662,400
1895	6,970,015	Total	162,580,179

Dividends.—In the matter of dividends the district has done itself proud. The principal dividends for the year paid by the public stock companies are as follows: Portland, \$720,000; Gold Coin, \$210,000; Anchoria-Leland, \$36,000; Elkton Consolidated, \$67,500; Gold King, \$100,000; Mary McKinney, \$30,000; Raven, \$30,000; Jack Pot, \$150,000; Isabella, \$270,000; Grafton, \$10,000; Lillie, \$135,000; Vindicator, \$177,625; Stratton's Independence, \$976,000; Modoc, \$30,000; Last Dollar, \$20,000; Golden Cycle, \$105,000; Garfield Consolidated, \$12,000, and Consolidated Mines, \$10,000, making a total of \$3,089,125. The Mt. Rosa Company also paid a dividend of \$40,000 from the sale of property, and the Orphan Bell about \$80,000 from the same source. The Strong undoubtedly paid dividends, but as it is a very close corporation the amount is not known. The Anchoria only paid two quarterly dividends, those being distributed during the first part of the year. The Elkton resumed dividends the latter part of the year. The Victor and the Moon-Anchor did not pay any. The Isabella has resumed, after 2 or 3 years, and is now paying on a larger scale than before. Among the new payers during the year are the Gold King, Mary McKinney, Stratton's Independence, Jack Pot, Grafton, Garfield Consolidated, Last Dollar and Consolidated Mines. All the regular payers distribute quarterly except the Portland and Gold Coin, which still pay monthly.

Mining at Leadville in 1899.

By Our Special Correspondent.

The output for the camp during 1899 will be about \$10,000,000, a remarkable showing considering the difficulties overcome. The output of the camp in all metals for the past 21 years shows a total valuation of \$262,000,000.

At the opening of 1899 mining in Lake County occupied a strong position. The great sulphide basin of Graham Park was producing vigorously as ever and the immense shoot of South Iron Hill, on which the A. Y. & Minnie and Moyer mines are located, was again productive. Breece Hill had added a number of heavy shippers to its list during 1898. The Big Evans section was offering every evidence of vitality both in the number of its mines and their output. The manganiferous iron market was good and a large tonnage was made monthly. Unwatering the down-town mines had at last started under auspices that promised successful results. A railway branch to Ibox, with a spur to the Resurrection, materially facilitated work along its line.

All these facts augured a great advance during 1899, and despite a series of unforeseen and, so far as this district is concerned, unavoidable vicissitudes, the summary justifies every promise and finds Leadville with greater pride and confidence than ever in the extent and availability of her mineral resources.

There are now four great smelters in active operation as compared with two at the beginning of the year, which, with additional capacity of the earlier plants, practically doubles the reduction works of the district. An electric railway system to traverse the city and extend to Evergreen Lakes has been planned. Numerous stock companies are being organized to develop acreage either owned or leased by them.

It is impossible to overestimate the outlook. Not a sign of labor troubles mars the horizon. Men are fully employed, and in spite of accessions daily, cannot meet the demand for able-bodied intelligent labor. There is a minimum of litigation in connection with property titles. New work under way is certain to add much territory to the known productive area. Facilities for economical mining are greater than ever before. The clouds of vicissitude have apparently drifted away and to-day the mining industry of Leadville occupies a stronger position than ever in its history. Here are ore deposits where for years labor will find employment, and present conditions offer the strongest inducements for legitimate mining investment.

The exact figures for the year's production are \$9,672,374, as against \$8,031,940 in 1898. The tonnage for the year also shows a large increase, being considerably over a half a million tons of all classes of ores shipped.

Following is the entire metal products for the past year:

Product.	Quantity.	Market Value.	Total Value.
Gold, oz.	106,203	\$20.67	\$2,195,222
Silver, oz.	6,930,120	.5962	4,132,128
Lead, lbs.	51,332,760	.0427	2,213,259
Copper, lbs.	3,340,064	.16114	538,218
Spelter, lbs.	10,575,240	.05	528,792
Manganese ore, tons.	15,653	3.50*	54,785
Bismuth, estimated.	.....	.....	10,000
Total	.....	.....	\$9,672,374

* Per ton.

BULLION PRODUCED FROM LEADVILLE DISTRICT ORES BY LEADVILLE SMELTERS DURING 1899.

Name of Smelter.	Net Tons Ore Smelted.	Ounces Gold.	Ounces Silver.	Pounds Lead.	Pounds Copper.
Arkansas Valley Plant.....	163,942	69,021.881	2,573,935.69	26,834,385	874,964
Bi-metallic Plant.....	69,388	22,663.	1,403,800.	.....	2,277,145
Union Plant.....	10,610	2,812.809	175,474.22	1,074,205	.....
Total.....	243,940	94,496.690	4,153,210.91	27,908,590	3,152,109

The producers of the camp show the following tonnage for the year:

Mine.	Car-bonate.	Oxidized Iron.	Sulphide	Zinc.	Sillicious
Iron Silver Mine.....	2,878	.....	54,525	4,125	.....
Ibox.....	.....	.....	38,000	.....	12,500
A. Y. and Minnie.....	2,015	.....	46,000	665	.....
Resurrection.....	.....	.....	.....	.....	35,772
Penn.....	.....	.....	.....	.....	35,000
Maid and Henriett.....	4,243	14,462	7,614	5,343	1,400
Mab.....	.....	.....	31,347	.....	.....
Small Hopes.....	3,644	1,758	23,778	.....	.....
Home Mining Co.....	6,000	14,000	.....	.....	.....
Morning Star.....	1,000	12,000	.....	.....	.....
Louisville.....	50	10,200	.....	200	.....
A. M. W.....	.....	.....	10,750	.....	.....
Matchless.....	.....	6,580	.....	.....	.....
Dunkin.....	.....	5,527	.....	.....	173
Yankee Doodle.....	224	2,265	.....	.....	.....
R. E. Lee.....	.....	2,490	.....	.....	.....
Gunnison.....	.....	.....	.....	.....	4,500
Habendum.....	.....	.....	4,000	.....	.....
Weldon.....	5,000	3,000	.....	.....	.....
New Monarch.....	.....	.....	1,500	.....	4,800
New Northern.....	.....	7,000	.....	.....	.....
M. N. Fraction.....	.....	.....	3,200	.....	.....
William Wallace.....	.....	4,080	.....	.....	.....
Coronado.....	.....	1,200	.....	.....	.....
Seneca.....	1,000	4,000	.....	.....	.....
Little Chief.....	1,400	2,000	.....	.....	.....
Boreel.....	.....	2,335	.....	366	.....
Evening Star.....	.....	4,500	.....	.....	.....
Continental Chief.....	.....	.....	.....	.....	300
Benton.....	.....	350	.....	.....	.....
Lillian.....	900	200	.....	.....	400
La Plata.....	500	.....	.....	.....	.....
Big Four.....	.....	.....	800	.....	100
Emmett Mining Co.....	.....	40	.....	.....	80
Manganese from Catalpa (Present and other Manganese Producers.....	.....	15,655	.....	.....	.....
Catalpa Crescent.....	.....	13,000	.....	.....	.....
Mahaia.....	.....	.....	9,000	.....	.....
Dollie B.....	.....	.....	.....	.....	6,000
Greenback.....	.....	.....	6,000	.....	.....
Niles Augusta.....	.....	10,000	.....	.....	.....
Golden Eagle.....	.....	.....	.....	.....	4,000
Miscellaneous.....	2,000	4,000	3,000	.....	3,000

Progress in Mining in Montana in 1899.

By Our Special Correspondent.

The mining industry in Montana during 1899 shared the general prosperity and activity of the year to the fullest degree. With a few exceptions the industry has been fortunately free from the injurious influences of strikes, shut downs, disasters or failures.

While the advanced prices of copper and lead have encouraged exploitation in both old and new districts, yet the general result has been one of extension of the mines and mills already in operation rather than the discovery of new deposits. In brief, the beginning of 1899 found Montana producing about to its full capacity with the present equipments of mills and smelters. It became necessary, therefore, that great improvements and additions to the present milling plants should be made if the rapid growth of past years was to continue. Consequently the year was marked by the most extensive enlargements and improvements in the history of mining in Montana. All of these anticipate large increases in production, particularly of copper and its by-products, gold and silver, but the effect is probably not apparent in the production for the past year. Some increase over 1898 was undoubtedly made, though perhaps the yield of 1897 was not surpassed.

The most important event of the year as regards consolidation of interests and readjustment of milling methods was the organization of the Anaconda, Washoe, Parrot and Colorado companies into the new Amalgamated Copper Company, with Marcus Daly as president. This put the control of 15 of Butte's most important mines, with an average of 1,500 ft. depth to the mine, into the control of the new company. In the rearrangement of the hoisting and pumping plants for these mines the plan of centralization will be followed. The Parrot smelter was likewise closed down to lessen the cost of smelting the company's ores, which was done by centralizing the work at Anaconda. The other smelter, the Colorado, however, is still running.

At Anaconda the greatest changes are going on, chief of which are those in the furnaces and concentrators. Three new matte furnaces, with interior dimensions of 42 ft. by 14 ft., the largest ever built, have lately been put in operation. The charge that these furnaces can successfully handle is 15 tons. The result of all of these improvements will be to increase the output, to decrease the cost of reduction and materially increase the percentage of extraction. The last two months of 1899 gave a material increase in output of copper at these works, approximating 2,500,000 lbs. per month, making a total of nearly 12,000,000 lbs. per month.

The Boston & Montana Company has made great additions to its Great Falls plant, as has also the Montana Ore Purchasing Company to its works in Butte. Most of the companies have begun erecting open steel gallow frames for the hoisting plants.

Another marked change in the Butte mines was the let up in sinking and the increase of men employed. Only about 4,000 ft. of sinking was done, as compared with 8,500 in 1898. This, taken in connection with the fact that 7,700 men were employed as compared with 6,550 in 1898, would indicate a much larger output of ore and consequent larger production of copper and silver. It is of interest to note that over 62 per cent. of the miners employed in the State find work in the Butte District.

Every mine in the districts outside of Butte that can produce a shipping ore of copper and silver or gold has felt the effects of improved conditions, and while no new districts as such have gained unusual prominence, many of the smaller ones have now attained a very encouraging position of stability. Particularly noticeable of these are the Libby District, in Flathead County, and the Bear Gulch Mines in

Park County. In both of these districts much improvement in the way of developing the mines and erecting permanent plants for hoisting and concentration has been made. At Libby the ore is a silver-lead ore of high grade, with some veins of gold-bearing quartz. The mines at Castle and at Copperopolis, Meagher County, are much handicapped by lack of railroad facilities, or they would make a stronger showing.

Of particular value to the industry are the mills and smelters that have been put in operation near the mines for custom work, as these help the small producers and the owners of low-grade ores in the best possible manner. The smelter at Twin Bridges, which will take the ores from the Gravelly and Tobacco Root ranges of Madison and Jefferson counties, is one of the greatest benefits to the industry. In like manner the custom mill near Garnet and the smelter at Basin are some of the advances of the year.

It is to be regretted that the Iron Mountain Company of Missoula County should have closed its mine. This, with the mines at Marysville and the Hope at Basin, are the few properties that seemed to have failed to share the great prosperity of 1899, while the New Elkhorn of Jefferson County closed down.

The production of lead for 1899 will probably show a decrease, as practically all of the lead ore mined came from the districts in Cascade, Broadwater and Meagher counties.

In the production of coal and coke the year has marked the opening of two new and important districts, both of which are equipped to produce heavily. The mines on Clarke's Fork, Carbon County, at Gebo and at Bridger, are regular producers.

On Trail Creek, on the edge of Park County, new coal mines, which are a part of the field lately opened up at Chestnut, Gallatin County, are soon to be active producers. The gain from these new fields was offset by the diminished output of the Anaconda plant at Belt. This company had a short run in March with the new washers and made some coke, and then all work was suspended by a strike at the mine, which caused a loss of over a month's time, thus materially diminishing the output. The Montana Coal and Coke Company, at Horr, lately reorganized, with new officers, and material improvements in the methods of conveying the coal from the mine have been added. The output of the mine and ovens was less during the first half of the year of 1899 than in the same period in 1898, but the total will be about the same.

Altogether the coal industry has been marked by the same improvements in mining and hoisting machinery as the other industries, and while the output will not exceed that of 1898 the capacities of the mines are greatly increased for the coming year's demands. The year's output of coal was 1,400,000 tons, and of coke 56,500 tons.

Owing to the low price of silver the exclusively silver mines have made no progress. The Granite mines have managed to keep running, though, as in most similar cases, the development of new bodies and new veins has practically ceased.

Litigation has to no great extent deterred the progress of the industry during the past year. A few companies show a pernicious persistency in the legal contentions over ownership of veins, and in one late case the closing of all of the Anaconda mines seemed to be threatened, but was happily averted. Probably few mining districts could stand the expensive suits that Butte has under way, but owing to the mammoth scope of its mineral industries the closing of one or two mines by litigation is scarcely felt.

Utah's Metal Mines in 1899.

By Our Special Correspondent.

Utah's mining industry is flourishing and steadily improves. While transformations of prospects into noteworthy producing mines the past 12 months have been few, a new record is made in yield of smelter products. This refers particularly to products marketed at custom smelters and speaks well for the old reliable mines, as the properties of the United States Mining Company—Old Jordan & Galena, Niagara and Old Telegraph, at Bingham—have suspended production while being equipped for more extensive work. It would be erroneous to infer that there were no ore uncoverings in new properties in 1899, but their contribution to the year's yield was small. They will be heard from another season more positively.

This summary is written before the metal statistics for 1899 are made up, though sufficient is known to affirm that the final revised figures will show an increase in gold, silver, copper and lead—copper will be fully 100 per cent. greater than in 1898 and gold will not be far behind. In addition, the stocks on hand at the smelters, copper matte, ore and concentrates products, which were mined and marketed during the year amount nearly to \$1,000,000, against less than \$400,000 in stocks on December 31, 1898.

Bullion and Ore Shipments.—Mr. D. S. Spencer, of the Oregon Short Line Railroad, who makes up a weekly statement of the ore and bullion shipments out of the State, furnishes these totals for the year ending December 31st, 1899:

	Pounds.
Silver-lead ore.....	89,925,227
Silver-lead bullion.....	50,017,257
Copper bullion.....	7,812,875
Copper ore.....	30,000
	147,785,359

To haul this tonnage required 3,775 railway cars. Compared with 1898 shipments, there was a decrease of 17,417,986 lbs., in the total tonnage, or a trifle over 10 per cent., due to the fact that less lead-silver ore was needed by Colorado and other smelters. There were about 9,000,000 lbs. more lead-silver bullion and over 3,000,000 lbs. more copper shipped than in 1898. The figures do not include the copper products shipped by the Uinta Copper Summit Company, which go out by the Union Pacific from Carter, Wyoming. Of these no accurate weights or copper contents are known, and the only information obtainable is that \$40,000 was realized from sales of copper ores, which would indicate 400,000 lbs. copper at least.

The figures given by Wells, Fargo & Company more closely approximate the actual result in Utah than in any other State, since that company retains in its hands a much larger share of the carrying business

in Utah than elsewhere. These figures give the output of the State as below:

	1898.	1899.	Changes.	Per cent.
Gold.....Oz.	104,900	173,266	I. 68,366	63.4
Silver.....	7,544,722	7,736,248	I. 191,522	2.5
Copper.....Lbs.	5,333,638	9,967,960	I. 4,634,322	87.4
Lead.....	90,346,100	90,062,300	D. 283,800	3.3

There was more copper contained in ores shipped out of the State for treatment than had been generally supposed. Most of these ores went to Colorado smelters.

Utah Lead-Silver Smelters in 1899.—From January 1st to April 15th the smelters retained their old-time individuality, and on the latter date the transfer to the American Smelting and Refining Company became operative. Immediately on taking control the Hanauer plant was put in shape to go out of commission, and has been idle since the transfer. What was formerly known as the Pennsylvania smelter has revived an older name still, and is now styled Mingo Plant of the American Smelting and Refining Company. The total output of the Utah smelters has been as follows:

	1898.	1899.	Changes.
Lead, lbs.....	50,633,065	51,591,472	Inc. 957,622
Copper, lbs.....	4,641,850	4,395,095	Dec. 246,750
Silver, ozs.....	4,410,527	4,641,322	Inc. 230,795
Gold, ozs.....	35,994	38,645	Inc. 2,651

There was some copper handled by the Hanauer, but as the matte was sold to the Germania, no account was taken of it for statistical purposes, and in the same way the 210,753 lbs. copper credited to the Pennsylvania smelter appears again in the Germania, which shipped it as blister. At end of year there was over 700,000 lbs. copper in matte and ores in smelter stocks, not included in above summary.

IRON AND STEEL.

The year 1899 was one of unparalleled prosperity and productiveness for the iron industry in the United States. The preceding year 1898 was one of large production and demand, but of comparatively low prices, the consumption being still a little below the supply, so that competition was strong and the mills were inclined to sacrifice profits for the sake of obtaining work. Early in 1899, however, it became apparent that two years of large crops, heavy grain exports and high prices for the products which we sell abroad, had very much changed the financial condition of the country. It is true that this applied with almost equal force to the second half of the year 1898, but we had not then recovered from the effects of the five years of enforced economy which followed the panic of 1893, and a spirit of caution was yet abroad among the people. It was gradually passing away, however, and early in the year just closed it became apparent that the savings of the previous years were to be freely expended in new construction of every kind—in a word, that a boom was coming. Some conservative manufacturers held back for a time, but were finally convinced as well as the more progressive; while a few long-headed ones, including the great leader of the trade, had foreseen what was coming and had spent years in preparation for it.

We have to recall in every department of the industry in a word the greatest production ever made, and an ability to meet demand which has surprised many in our own country, as well as abroad. Partly on account of this, however, we cannot speak of as much metallurgical progress as we had hoped for, and there have been no great changes made during the year. In the following columns we endeavor briefly to trace the course of production in the United States in 1899.

Iron Ore.—The production and consumption of iron ore in 1899 was enormous; great as the demands of the furnaces were, they were met, and there has been during the year but little complaint as to the supply of raw material. The notable feature of the year has been the extraordinary development of the Lake Superior Region. We estimate that the mines of Michigan, Minnesota and Wisconsin furnished this year the ores from which were made close upon 80 per cent. of all the pig iron turned out in the United States. The total production and consumption of iron ores in the United States in 1899 was approximately as follows:

Lake Superior region.....	18,301,000
Southern.....	4,800,000
Eastern, Ohio and other local ores.....	2,240,000
Total.....	25,341,000
Add iron ores imported.....	620,000
Total.....	25,961,000
Deduct increase in stocks.....	750,000
Total consumed.....	25,211,000

The increase in ores mined in the Southern States was moderate only, and the production of that section has not increased very largely over that of the preceding year. In Eastern and local ores there was a considerable advance. The iron ore imported, estimating the month of December, was 620,000 tons, or more than three times as much as in 1898, when the total was only 187,219 tons. The increase went to a few furnaces on and near the seaboard. A large part of it came from Cuba, where the iron mines of the Santiago District were reopened almost immediately after the conclusion of the Spanish war. A few cargoes were received from Spain, although English demand for those ores is so strong that the prices have advanced to a point higher than our manufacturers care to pay. A few cargoes were also received from Elba, and one or two from Greece and Algeria. Some Newfoundland ore has been offered in the seaboard markets, with the result that large contracts for its delivery during 1900 have been made. The Cuban ore, however, will probably continue to be our principal resource where we have to go beyond our own limits.

When in 1896 the shipments from the Lake Superior Region approached a total of nearly 10,000,000 tons, it was supposed by many that a limit had been reached; but from the total of 9,934,828 tons in that year the shipments grew to 12,469,638 tons in 1897, to 14,024,673 tons in 1898, while in 1899 the quantity of ore carried by vessels to the ports on the lower lakes was 17,901,358 tons, to which is to be added a quantity shipped by rail, which has not yet been fully ascertained,

but which will approach 400,000 tons, making the total shipments 18,301,000 tons.

Ports.	1896.	1897.	1898.	1899.
Escanaba	2,321,931	2,302,121	2,303,513	3,720,218
Marquette	1,564,813	1,915,519	2,245,965	2,733,596
Ashland	1,566,236	2,067,637	2,391,088	2,703,147
Two Harbors	1,813,992	2,651,465	2,683,246	3,973,733
Gladstone	220,887	341,014	335,955	381,437
Superior	167,245	531,825	550,403	878,942
Duluth	1,988,932	2,376,064	2,635,292	3,506,965
Total by lake	9,644,036	12,215,645	13,655,432	17,901,358
Total by rail	290,792	253,993	369,241	400,000
Total shipments	9,934,828	12,469,638	14,024,673	18,301,358

A very large part of this increase came from the mines of the Mesabi Range, which were not only worked to the full capacity of the existing mines, but were increased by the addition of new mines to the shipping list. While the division of shipments by ranges is not yet completely made up, we may say that approximately the Mesabi shipments were 6,800,000 tons, while its neighbor, Vermilion Range, in Minnesota, sent out 1,760,000 tons. The increase in production was not confined to the newer districts, however, since the old range mines showed themselves capable of a greater increase than had really been expected from them. From the Marquette Range the shipments were about 3,760,000 tons; from the Menominee Range 2,800,000 tons were shipped, and from the Gogebic Range about 2,750,000 tons. Heretofore the great Norrie Mine on the Gogebic has been the only mine in the region whose output exceeded 1,000,000 tons yearly, but in 1899 at least two Mesabi mines, the Mountain Iron and Fayal, sent out over 1,000,000 tons.

Large as the shipments were, they have generally been sold up, and while the exigencies of shipments require some accumulation on the docks at the Lake Erie ports, practically all of this has been sold, and will be shipped to furnaces during the winter. Fortunately, the fall was an open one, and the season of navigation lasted well into December, so that the Lake vessels were able to handle the extraordinary tonnage which was ready for them.

The absorption of mines and carriers by the leading iron and steel producing interests has made rapid progress during the year, and next season by far the greater part of the Lake Superior output will be mined by these producers and carried in their own vessels. Some of the changes made will be found at length in the article by our Duluth correspondent on the following page.

Pig Iron.—The production of pig iron in the United States in 1899 is given in the accompanying table, the totals being compared with those for 1898. In this table the first half of the year is given from the completed returns of the American Iron and Steel Association, while the second half is estimated on the basis of the weekly capacity of furnaces in blast. In these tables we have dropped entirely the old-time division according to fuel used, which has now little or no meaning. The great bulk of the iron is made with coke; the so-called anthracite furnaces use a mixture of anthracite coal and coke, and the tendency is continually to diminish the proportion of anthracite. Two or three furnaces only, making comparatively a trifling quantity of iron, used anthracite alone. About 305,000 tons, or less than 2.5 per cent. of the total production, were made with charcoal as fuel. The figures in the table are in long tons, and the division adopted is that which the American Iron and Steel Association has approved by several years' use, into foundry and forge irons: Bessemer pig; basic pig; spiegeleisen and ferromanganese.

	1898.	1899		Year.
	Year.	First half.	Second half.	
Foundry and forge irons	3,437,337	1,929,807	2,259,608	4,189,415
Bessemer pig	7,337,384	3,788,907	4,430,892	8,219,799
Basic pig	785,444	465,957	544,661	1,010,618
Spiegel and ferro	213,769	104,496	125,125	229,621
Totals	11,773,934	6,289,167	7,360,286	13,649,453

The increase of 1,875,519 tons, or 15.9 per cent., was quite evenly distributed. The larger part was in iron intended for the manufacture of steel, but there was a very large demand for foundry iron, and the consumption of forge irons was also considerable, although the puddler still continues to give way before the advances of his steel making rival. The great total of pig iron shown in the table is not only the largest quantity ever made in the United States, but is greater by over 4,500,000 tons than the largest quantity ever made in Great Britain in a single year, and is far in advance of the totals shown by any of our rivals in the trade.

Steel.—The completed figures for steel will not be ready for some time yet, but estimating on the basis of the pig iron production, our output of steel in 1899 approximated 10,375,000 long tons. The Bessemer steel may be estimated at 7,620,000 tons, and the open-hearth 2,630,000 tons, whereof 1,840,000 tons were basic and 790,000 tons acid steel. Very nearly all the Bessemer steel was made by the acid process, although the basic Bessemer plant at Pottstown, Pennsylvania, was started up toward the close of the year. The Thomas-Gilchrist process continues to be in little favor in this country, nearly all the basic steel being made by the open-hearth process. A large addition will be made to the output of basic steel in 1900 by the great plant at Ensley in Alabama, which was started up in December, but is not yet fully completed.

Changes in Iron and Steel Manufacture.—Comparatively little progress, as we have already noted, has been made in the metallurgy of iron and steel during 1899. The great demand has been partly to blame for this, as in a period when all their energies are concentrated on the necessity of filling pressing orders, ironmasters are but little apt to consider changes or economy in production, and perhaps to think that they are unnecessary. The advances made during the year have been chiefly mechanical, and in the line of the quicker and better handling of material, and the increase of production of furnaces and mills to the highest possible point. The systems of handling, carrying and transshipping ores and fuel on their way from the mines to the furnace seem to be approaching perfection. When we find a vessel which, like

some of the latest Lake ore boats, can carry from 7,000 to 8,000 tons of ore, and will spend less than a day in loading and unloading at each end of the line, it will be readily admitted that there is but little improvement to be made in machinery and methods. Our larger furnaces also are provided with appliances for handling, stocking and charging ore and fuel, which seem to leave but little to be desired.

Last year we referred to the great furnaces of the Carnegie Steel Company, at Duquesne, with their output running from 500 up to 600 and even 700 tons a day. These are not without their rivals, for during the year the two large furnaces at the Lorain plant of the Federal Steel Company have been completed, which are doing about the same quantity of work. The two Eliza furnaces in Pittsburg have been rebuilt and enlarged to almost the same capacity, while the National Steel Company has begun the construction of a group of furnaces of similar size at Youngstown, Ohio.

In connection with these large furnaces a most important mechanical addition has been in the development of the casting machine. This is not merely a necessary adjunct to these large iron makers; its use has made such furnaces possible. If any of our readers who are familiar with blast furnaces will consider the difficulty, cost and space required for handling 600 tons of iron in one day by the old method of casting in sand, they will see that the drawbacks attendant on that process would entirely offset the advantages gained by the size of the furnace. The Uehling casting machine, which was the first to come into practical use in this country, has been added to and improved by other inventors, and some appliance of this kind is now an indispensable adjunct to a modern blast furnace.

Another important development of recent years which adds very considerably to the economy and the rapidity of work in a large plant is the use of the continuous process, in which the iron from the blast furnace is not cast into pigs at all, but passes in a molten condition directly to the Bessemer converter, or the open-hearth furnace. A necessary part of this process is the mixer or reservoir, which serves a double purpose of keeping a supply of iron ready for the converter and permitting the mixture of the iron from several stacks where it is thought desirable. Over this device there has been some litigation, the Carnegie Company owning the Jones mixer patent, and claiming that any use of such a mixer or reservoir was an infringement. So far the courts have inclined to set this claim aside, although a final hearing in the case is still to be had.

We referred last year to the use of the waste gas from blast furnaces for the production of power through the medium of the gas engine. We regret to say that nothing has been done in this direction in the United States so far, although it is really one of the most important developments in a number of years and promises to be a considerable factor in reducing the cost of making iron. In Belgium and Germany considerable work has been done during the year. The small experimental plants in the John Cockerill Works at Seraing, in Belgium, were succeeded first by an engine of 150 H.-P., and a plant including several engines of 350 H.-P. is now nearly completed. The careful investigations made at these works and in Germany have satisfied furnace owners there of the great value of the gases which have hitherto been wasted, and have satisfied them also that the objections which were first made were very much overrated. At the large furnace plants at Hoerde and Differdange, in Germany, all the furnace machinery, including the blowing engines, is to be operated by gas engines taking their supply from the waste furnace gases. An installation of six engines of 350 H.-P. each is now being brought into use at Differdange, and other German plants are preparing to follow in the same direction. Less has been done in Great Britain, although an experimental plant at Wishaw, in Scotland, has been very successful, and several English iron companies are investigating this question. We regret that our own ironmasters have been somewhat backward in taking the matter up, and hope that another year will show a marked change in this respect.

We have referred above to the completion of the large plant for making basic steel at Ensley, in Alabama. Our readers will probably recall some unsuccessful experiments made years ago in steel making from Alabama pig iron. These failed, not because of anything in the quality of the iron, but rather because empirical and untried methods were followed. The Birmingham Rolling Mills Company has had a small basic steel plant, with two furnaces, in operation for some time. The Ensley plant is of importance, not because it proves that steel can be made in Alabama—for that was done long ago—but as showing that the Southern ironmasters have at last realized the advantage which they can gain by selling their product in the advanced form of steel, rather than in the cruder state of pig iron. The Ensley plant is owned by the Alabama Steel and Shipbuilding Company, which, in turn, is controlled by the Tennessee Coal, Iron and Railroad Company, and it is to be supplemented by rolling mills which will turn out plates, structural shapes and other forms of finished steel. Other steel works are talked of in connection with the Birmingham and Sheffield furnaces.

Combinations and Consolidations.—The process of combination and consolidation in the iron trade, which we commented upon a year ago, continued actively during the first half of 1899, and a number of new companies were formed, including several combinations of blast furnaces and steel mills in the West and South, bar iron mills, pump makers, bridge builders and car builders. In almost every case these consolidations followed the modern practice, and were actual amalgamations of firms or companies by purchase, the old plan of agreements between existing companies having been definitely abandoned, in consequence of legal difficulties and the proved instability of such agreements.

Toward the end of the year financial conditions, resulting chiefly from the enormous investment in industrial stocks in the early part of the year, and in part also from the tendency of over-capitalization, forced a suspension in the organization of new companies, and several projective consolidations have been laid aside for the present.

The World's Production of Iron and Steel.—Activity in iron and steel trade was not confined to the United States, but ex-

tended to all the industrial countries of Europe. In the first half of the year Great Britain produced 4,782,868 tons of pig iron and 2,587,241 tons of steel, and the estimates made for the second half of the year indicate a total output of 9,700,000 tons of pig iron and 5,200,000 tons of steel for the year. A feature of the British manufacture is the increasing preference for open-hearth steel, 61 per cent. of the total made in the first half of the year belonging to that class, while only 39 per cent. was Bessemer steel. Of the total, again, 85 per cent. was acid and 15 per cent. only basic steel. In Germany the blast furnaces reported for the ten months ending with October a total of 6,719,853 metric tons of pig iron, an increase of 10 per cent. over 1898, and the total for the year is estimated at 8,165,000 tons, by far the largest quantity ever reported. In Belgium the estimated result of the year is a production of 1,015,000 tons of pig iron, 501,500 tons of wrought iron and 719,500 tons of steel. In France, Austro-Hungary and Sweden substantial increases have been made. In Russia the Oural District shows a slight falling off in production, but this was more than made up by a large increase in the Moscow District, in South Russia and in Poland; while the iron mines of Eastern Siberia are beginning to be worked on a considerable scale. The extension of the Siberian Railroad from Tomsk to Irkutsk and the probable early construction of a branch into the Altai region will undoubtedly mean the opening of large deposits of iron ore and coal and the construction of many new furnaces.

We estimate that the total production of pig iron in the world in 1899 was in round figures 41,000,000 metric tons, an increase of 3,500,000 tons over 1898; while steel making showed even a greater proportionate increase, and amounted to 27,000,000 tons, an advance of nearly 3,000,000 tons over the preceding year.

The Iron Markets in 1899.

The year was marked, especially in its second half, by a rapid and continuous rise of prices of all descriptions of iron and steel, and the range, as shown in the reports of our various correspondents below, has been greater than it ever before showed in a single year. In pig iron, for instance, Bessemer, all grades of foundry and gray forge, both from Northern and Southern furnaces, sold in December for more than twice the prices quoted in January, and the same remark applies to finished iron and steel. It must be remembered, however, that these high prices had comparatively little effect upon the production of 1899, and their effect will not be fully felt until the first part of 1900. A large part of the production of 1899 was delivered under contracts made early in the year, when the range of prices was comparatively low. Nevertheless, the returns secured by manufacturers have been most encouraging to them, and the profits have been larger than for a number of years, although it is to be remembered that fuel, ores and labor are all costing much more at the present time than one year ago.

The rapid rise in prices toward the close of the year resulted in some curious transformations, which may be considered among the humors of the trade. Early in the year large quantities of steel rails were contracted for at prices ranging from \$16 to \$18 per ton; but we know of several cases where, before these rails were delivered and laid, quotations had gone up to a point where the old rails worn out and taken up were actually sold for a higher price than was paid for the new steel that replaced them. In one instance steel rails costing a company \$17 were laid down, and the old rails taken up were actually sold for \$22 per ton. It is not every year that a railroad company can relay its track and not only be repaid the full cost, but secure a premium besides for so doing.

The conditions in the various local markets are fully explained in the letters of our correspondents, which follow:

Export Trade.—The exports of iron and steel and their manufacture, including machinery, were the largest on record. The total value for the 11 months ending November 30th is reported by the Treasury Department at \$95,454,598, against \$74,722,161 in the corresponding period of 1898, and \$56,858,303 in 1897. The total value of our exports when the month of December is added will undoubtedly have exceeded \$100,000,000, an amount which would be considered simply impossible a few years ago. It must be remembered that we have made these exports at a time when the home demand was exceedingly large, and the fact that we should be able to supply foreign consumers with so large a quantity of iron and steel and their products is exceedingly gratifying.

In some forms there was a decrease, due principally to the large home demand, which prevented the acceptance of foreign orders in which early delivery was a condition. Thus in the 11 months the exports of pig iron were 216,600 tons, against 221,480 in 1898, while those of rails were 245,599 tons, against 276,346 tons in 1898. In many of the staple products, such as structural material, bars and the like, there was no material change, but the exports of plates this year amounted to 110,143,437 lbs., against 53,510,099 lbs. in 1898, while shipments of wire were 241,922,967 lbs., against 151,626,312 lbs. in the preceding year.

Railroad Consumption of Iron and Steel.—The general prosperity of business throughout the year furnished the railroads with funds to make the renewals and improvements which had in many cases been postponed as far as possible. The large increase in railroad traffic also made necessary heavy additions to motive power and rolling stock. These conditions made the railroad demand an important factor in the iron market, especially during the second half of the year. The rail mills have not only been fully occupied during 1899, but closed the year with orders sufficient to keep them busy during the greater part of 1900. The locomotive builders, and car builders report the same condition of affairs. A notable instance is that of the Baldwin Locomotive Works, in Philadelphia, whose production for 1899 was 970 locomotives, of which no less than 358 were for railroads outside of the United States. The Schenectady, Paterson, Dunkirk and Richmond builders all had the full capacity of their shops employed. A very notable fact was the purchase of a number of engines from American builders by English railroad companies, while the

French State railroads also added some American locomotives to their equipment. Other railroad material, such as rails, bridges and cars, was freely ordered from abroad. One order, which caused so much discussion that it might almost be considered as an international incident, was that of the great Athara Bridge, on the Soudan Railroad, which was taken by the Pencoyd Works, near Philadelphia, whose bid had to compete with the offers of all the leading English builders.

The Alabama Iron Market in 1899.

By Our Special Correspondent.

The Birmingham District and the State of Alabama, as far as pig iron, steel, coal, coke and kindred articles go, has seen a most eventful year. The changes for the better, the traffic in all these lines, the opportunities and the general conditions have been such as to present a wonderful picture. With leaps and bounds that seem incredible the market for the products named advanced during the year until the highest prices ever received since the institution of manufacturing plants in this State, were in vogue.

The actual story shows little increase in the production as far as pig iron goes, except from one furnace, but it is a fact that much repairing has been done on furnaces which have been out of blast for years and furnaces which have been in blast all along have been having remarkable luck in turning out the product. The capacities of furnaces in Alabama have been almost doubled since they were built. The pig iron which had been accumulated in the yards at the furnaces and in those of the American Pig Iron Storage Warrant Company, the result of several years of depression, the listlessness in the market and uncertainty prevailing, was cleared off inside of the year until to-day there is hardly more than a week's supply on hand, and the shipments are greater than the manufacture. The demand for the product took a good start early in the year and it increased as the confidence of the country grew. It was evident the early part of the year that there would be a good demand for the product. There were, however, no anticipations that the demand would turn out to be as great as it did, and it was well on to the middle of the year before the boom was realized and men with means and persistency began searching for properties with which to enter the manufacturing world. Old furnaces were bought in, coal, ore and limestone properties were bought profusely until to-day there is but little land bearing minerals to be had; while every furnace in the State is either in the course of repair or contracts are being made for its repair. During the early part of the coming year there will be several furnaces to go into blast which are not now in operation. The demand, which, as stated above, started with a rush and then took leaps, has been such that orders piled up and the blowing in of these furnaces will not interfere with the regular market, and will not cause any accumulation to affect the quotations.

Estimates are now being made as to the total output of the various products in this State. The production of steel will not be great. The little steel plant located at the plant of the Birmingham Rolling Mills, belonging to the Republic Iron and Steel Company, has been in operation quite steadily, but being a small affair its total output has not been so great. The big million dollar steel plant of the Alabama Steel and Shipbuilding Company, an offspring of the Tennessee Coal, Iron and Railroad Company, located at Ensley, was started on last year. It is not yet quite finished, but there are several of the 10 open-hearth furnaces in blast now, the first run of steel being made on Thanksgiving Day, November 30th. This run was a successful one and there are no doubts of the future of the plant. The mill will have a capacity of about 1,000 tons of steel per day. Already orders have been taken for the output of the plant, either in domestic markets or at the steel wire and rod mill, which is located within a stone's throw of the big manufacturing plant. This steel plant has been described before, and it will suffice when it is stated that there are 10 Wellman open-hearth furnaces. The mill is equal to any in the world. It has a blooming mill attached and it is intended, probably during the coming year, to add a rail mill besides other plants for the consumption of the steel manufactured there. The plant will be in full operation within the next few weeks, every effort being strained to get the work completed. This plant has been watched by the world, for it means realized that everything is tending toward the steel era. The building of this big plant will bring about a change in this district. Already the little steel plant at the Rolling Mills is being doubled in size and a blooming train is being put in. It is reported that the Republic Iron and Steel Company and the Sloss-Sheffield Steel and Iron Company, two companies with immense capitalization and owners of large properties in this State, are considering the construction of a large steel plant.

During the year just about to close, orders were taken for the production of iron furnaces which will be delivered on several months of the coming year. The furnaces which have been in blast all the time have sold ahead for over six months, while some of the furnaces about ready to go into blast have sold ahead three and four months, with prospects for more orders.

During the year just about to close there were several big combinations perfected in this State whereby properties passed into the hands of corporations and companies who have millions of capital and who are putting them into operation daily or already have them going. The following corporations have taken a hold in Alabama:

The Tennessee Coal, Iron and Railroad Company bought the properties of the Sheffield Steel and Iron Company, consisting of furnaces and ore properties. The same company is erecting a fifth furnace at Ensley and has under consideration the construction of a steel casting shop at Ensley.

The Republic Iron and Steel Company took in the rolling mills in Birmingham with its little steel plant, the rolling mills at Gate City, near Birmingham, the Pioneer Mining and Manufacturing Company, with its two furnaces at Thomas, coal and ore mines and limestone quarries in various portions of the State and a railroad with appurtenances between the furnaces and the coal mines.

The Union Steel and Chain Company took in the old Henderson steel plant at North Birmingham, and is preparing to put it in shape and double its capacity, and the rolling mills at Sheffield, Ala.

The Alabama Consolidated Coal and Iron Company purchased the two furnaces at Ironaton, the furnaces at Gadsden and Mary Pratt in Birmingham, the coal mines, washer and coke ovens of the Standard Coal and Coke Company, and immense bodies of ore lands in the State.

Adler Brothers purchased thousands of acres of coal and ore lands in various portions of the State, and have big contracts for supplying the companies manufacturing iron with ore.

The Eugene Zimmerman Syndicate purchased the Talladega Furnace with ore property adjacent.

The Bessemer Rolling Mill Company was formed and the old Bessemer rolling mills were purchased and have been put in shape for operation the early part of the coming month. The company will have its own coal mines.

The Sloss Iron and Steel Company properties were consolidated with coal and ore properties and the Sloss-Sheffield Steel and Iron Company has been formed. In addition to the four furnaces of the old Sloss Company, the two Ensley furnaces at Sheffield and the Philadelphia furnace at Florence have been taken in, and two of these will be in blast before the end of January, the Philadelphia Furnace going in blast this month.

Messrs. Perry Brothers and C. D. Smith & Company have taken hold of the old Trussville Furnace and the Williamson Furnace in Birmingham, and the same have been made ready to go into blast.

A new company has been formed and the old properties of the Alabama Iron and Steel Company, consisting of a furnace, rolling mill, nail mill, railroad property and town lots and houses, at Brierfield, in Bibb County, have been purchased.

The Carnegie Company is said to have purchased the two furnaces of the Woodstock Iron Company at Anniston.

It is not proposed to allow the furnaces taken in to stand idle. The foundries and machine shops have been given contracts for repairing and everything possible is being done to get the iron makers in blast.

Production.—According to the figures of Dr. Eugene A. Smith, the State Geologist, the following has been the production of pig iron for the three-quarters of the year, ending September 30th, 1899: First quarter, 242,590 tons; second quarter, 268,543 tons; third quarter, 262,861 tons. A conservative estimate is made of the production during the last quarter of the year at 274,800, which gives the estimate for the year at 1,048,794 tons. During the year 1898 the production was 1,033,676 tons, which, at the estimate made for this year, will show an increase for this year of 15,118 tons.

The figures given by Dr. Smith as to other production in this State were published in the "Engineering and Mining Journal" December 16th, 1899, page 724. Estimates carefully made give the following figures for the year 1899: Pig iron, 1,048,794 tons; coal, 7,559,281 tons; iron ore, 2,140,733 tons; coke, 1,834,550 tons. That these figures are conservative is not denied. For instance, State Mine Inspector J. deB. Hooper makes an estimate that the production of coal in this State for the year 1899 will be nothing less than 7,750,000 tons. The estimate given shows increases over 1898 of 521,025 tons coal and 334,414 tons coke.

Prices.—During the year just closed the prices for pig iron and for coal made large increases. For pig iron the highest prices paid were as follows, contrasted with those current in January, 1899:

	December, 1899.	January, 1899.
No. 1 Foundry	\$18.50 to \$19.00	\$8.00
No. 2 Foundry	17.75 to 18.50	7.75
No. 3 Foundry	16.75 to 17.50	7.50
No. 4 Foundry	16.00 to 16.50	.....
Grey Forge	16.00 to 16.25	6.50 to \$6.75
No. 1 Soft	18.50 to 19.00	8.00
No. 2 Soft	17.75 to 18.50	7.75

The higher prices named were given when quick delivery was demanded. There was but little need to accept reduced offers for iron on account of the condition of the market, and, remarkable to relate, the quotations were pretty well sustained all through the year.

In a nutshell, Alabama has had a glorious year. The new year comes on in a blaze of glory, anticipations sprung at the highest notch, some of the iron-masters believing that prices will go higher still than they are at present, and most of them believing that the markets will retain their firm condition for some time to come.

Alabama is fast forging ahead in the production of steel, pig iron, coal and coke. Contracts are out or work has been begun on the erection of four new furnaces during the coming year, two at Thomas, one at Ensley and one at Bessemer. Several coal mines have been recently opened in the State and several more are in contemplation. The erection of two steel plants during the coming 18 months is intimated, while the little plant at the Birmingham rolling mills will be enlarged and the old Henderson plant will be put in shape.

The Chicago Iron Market in 1899.

By Our Special Correspondent.

Never in the history of the Chicago iron market has there been such a demand for iron as the year 1899 furnished, every line of the industry having about sold its capacity for a year ahead before the first six months of the year had elapsed. From July on it was almost impossible for furnaces to accept contracts for immediate delivery, and it was merely a matter of booking contracts for delivery for three, six, nine, or even twelve months ahead. The year opened with a brisk demand. As the months went by this demand broadened until along toward July the pressure became intense and prices began to soar. Before the end of the year many of the larger furnaces were practically out of the market. The northern furnaces were sold up the most and the southern furnaces had a great run of business thereby. Prices on pig kept pace with the demand, advancing on the average about \$1 per month per ton for the year. Northern No. 2 foundry opened the year at \$11.50 per ton and closed firm at \$23.50. Foundries and other consumers had

great difficulty in obtaining supplies of pig iron during the latter half of the year and their business was curtailed in consequence. Some uncertainty exists as to future prices on pig, but the best authorities here

MONTHLY AVERAGE PRICES OF PIG IRON, CHICAGO, 1899.

Month.	Northern No. 2.	Southern No. 2.	Month.	Northern No. 2.	Southern No. 2.
January	\$11.50	\$11.25	August	\$20.25	\$19.75
February	12.25	12.00	September	22.25	21.75
March	14.00	13.75	October	23.50	23.50
April	15.25	15.00	November	23.50	22.50
May	16.25	16.00	December	23.50	22.50
June	17.50	17.00	Av. Year	18.25	17.70
July	19.25	18.75	Av. 1898	10.90	10.40

conclude that there will be no decrease for at least six months to come, and possibly further advances may be scored.

The Iron Ore and Coal Movement at Cleveland in 1899.

By Our Special Correspondent.

In the season of navigation just brought to a close more business was done than in any previous season. The latest estimates of the amount of ore brought down the lakes place it at 17,900,000 gross tons. It was figured at the opening of this season that if boats could be secured there would be 15,000,000 tons brought down. Then came the two tie-ups of the grain elevators at Buffalo and many boats were free to carry all of the ore that the mines could produce. There were many surprises during the year, and the boats and the mines exceeded expectations. The result has been most gratifying to ore dealers, giving assurance that the furnaces will not be in any wise hampered by the lack of ore.

If the ore movement has been satisfactory it does not signify that other commodities were equally well favored. It is now seen that there has been the lightest shipment of coal that there ever has been in proportion to the tonnage engaged. All of the figures are not in, but careful estimates have been made, and these show that the coal forwarded has fallen off about 1,000,000 tons. Many of the shippers are far short on their contracts, and will have to resort to all-rail shipments during the winter to help them out.

The Pittsburg Iron Market in 1899.

By Our Special Correspondent.

The year 1899 has been the most eventful, both as to production and prices, of iron and steel in the history of this industrial center. It was a year of surprises, and the proverbial "well-posted" manufacturer was forced into a back seat, as prices unexpectedly continued on their rapid upward course and did not decline notwithstanding predictions that a reaction was almost certain to occur.

When Bessemer steel billets reached \$18 a ton a few manufacturers got together and pledged themselves to hold the price at that figure and not sell at less as long as possible. It was soon found that a combination of the makers of billets was not necessary to maintain a profitable price, and before the close of the year as high as \$40 a ton was paid for billets, while a heavy volume of business was done at a few dollars less. Every line of raw and finished material more than doubled in value during the year. Premiums for prompt delivery were offered. Railroads were taxed to their utmost by the heavy tonnage and were unable to handle the freight as desired by both seller and buyer. Furnaces were hampered by the car shortage in the Connellsville coke region and a coke famine was frequently threatened during the year.

Every line of iron and steel products remained firm during the entire year with the exception of sheets, which, for some unexplainable reason, began to decline after prices had reached a profitable point. Bar iron made a greater proportionate gain probably than any other line, but with no immediate benefit to the producer. It had been lingering around the 1c. mark for months at the opening of the year and this price was even shaded for desirable orders. Before the close of the year as high as 2.75c. was paid. Manufacturers, however, did not receive as much benefit from high bar iron prices as in other lines, as sales were made away head at the low rate ruling early in the year, and the higher prices were not enjoyed by the producers until the third quarter.

Wire nails beat all records of advances, and increases at the rate of 10 and 15c. a keg were made with such regularity that they were expected. At the opening of the year wire nails in car load lots could be had at \$1.35, and cut nails at \$1.10, but before the close of the third quarter the former was quoted at \$2.85 and the latter at \$2.65. These rates were maintained during the balance of the year.

Bessemer pig iron could be bought in January at \$10.75, and if it had been known that \$25 and even a higher figure would rule in the fourth quarter it is unnecessary to say that more sales would have been made. The boom struck the iron market about the latter part of February and prices began to advance. Buyers placed their orders for pig iron cautiously, one concern contracting for 50,000 tons at \$12.50. Within a week the same concern duplicated the order at \$1 higher, and a month later \$15.50 was freely offered. In May \$16.50 was the price, and \$1 higher was quoted on June 1st. On July 1st Bessemer pig iron was selling at \$20, and \$2 was soon added to the price. In September the rate ran from \$22.25 to \$23.50, and October opened with pig iron at \$24. There was little left to sell for the balance of the year and several lots were disposed of at \$25 and higher. Foundry irons kept pace with Bessemer. No. 2, which sold in January at \$10.25, advanced to \$23.50 before December 1st. Proportionate advances were made in other grades.

Steel billets more than doubled in price during the year, opening at \$16.25 and closing at \$37, although during the past three months \$40, and even higher, was paid. While these high prices prevailed steel rail manufacturers were filling contracts for rails taken at \$16.50 a ton. Rails were advanced to \$37 for new business by an agreement of the makers, but a heavy joint order for delivery in 1900 was taken at \$33.

Structural material experienced a decided boom and the year closes with the two local mills from two to three months behind in deliveries. Prices have advanced about 75 per cent. since the beginning of the year, when beams and channels from 3 to 15 in. were quoted at 1.30c.; 18, 20 and 24-in. at 1.40c.; angles, 1.15c.; tees, 1.25c.; and tees, 1.30c. The average prices ruling during the last quarter were: Beams and channels, from 3 to 15 in., 2.25c.; 18, 20 and 24-in., 2.35c.; angles, 2.25c.; tees, 2.25c.; tees, 2.30c. Prices for steel plates advanced over 100 per cent. during the year. On January 1st tank plate was quoted at 1.25c. and flanges at 1.35c. During December, tank was quoted at 2.75c. and flange at 2.85c.

The sheet market opened and closed the year in a very unsatisfactory condition. On January 1st No. 27 gauge was quoted at the ridiculously low figure of 1.85c., No. 28 at 1.90c. and galvanized at 80 and 10 per cent. off. During December No. 27 was quoted at 2.90c., No. 28 at 2.95c.

DECEMBER PRICES FOR IRON AT PITTSBURG IN SIX YEARS.

	1894.	1895.	1896.	1897.	1898.	1899.
Bessemer.....	\$10.25	\$12.75	\$11.15	\$10.25	\$10.80	\$25.00
No. 1 Foundry.....	11.40	14.25	12.10	10.00	11.10	24.00
No. 2 Foundry.....	10.40	13.50	11.25	10.75	10.75	23.25
Mill Iron.....	9.25	11.75	9.80	10.25	10.65	21.50
White Iron.....	9.00	9.00	9.10	9.00	9.25	20.00
Mottled Iron.....	9.00	9.00	9.10	9.25	9.30	20.50
Silvery, No. 1.....	13.00	14.80	14.50	13.00	13.00	27.00
Charcoal, No. 1 Foundry.....	17.50	17.80	17.50	15.50	16.00	27.00
No. 2 Foundry.....	16.25	17.00	16.00	15.25	15.50	26.00
Cold Blast.....	23.50	23.00	22.25	21.50	21.50	28.00
Warm Blast.....	16.50	16.00	16.10	15.00	15.25	27.00
Muck Bar.....	18.40	21.00	19.75	18.75	18.85	33.00
Billets.....	15.15	16.50	16.00	15.50	16.50	37.00
Billet Ends.....	10.45	14.00	13.00	10.00	11.00	24.00
No. 1 Scrap.....	16.00	14.00	12.75	11.00	12.00	24.00
Steel Rails.....	32.00	28.00	25.00	18.50	17.50	37.00
Bar Iron.....	1.15	1.25	1.30	1.15	1.18	2.15
Iron Nails.....	1.00	1.25	1.60	1.30	1.30	2.50
Steel Nails.....	1.00	1.30	1.60	1.30	1.25	2.60
Wire Nails.....	1.00	1.30	1.55	1.45	1.50	2.95
Coke at Ovens.....	1.00	2.00	2.00	1.75	1.50	3.00
Ferromanganese, 80 per cent.....	49.50	54.00	48.25	47.00	50.00	100.00
Old Iron Rails.....	12.50	15.00	13.00	14.00	14.00	30.00
Old Steel Rails.....	10.00	13.00	12.75	10.50	10.00	23.00

to 3.05c. and galvanized at 75 per cent. off. The sheet market improved about the latter part of February, when prices advanced \$2 a ton and steadily increased until October 1st, during which month No. 27 averaged 3.20c., No. 28 3.30c. and galvanized 70 and 10 per cent. off. A slump occurred on November 1st, when the options on the sheet mills of the country for the proposed consolidation expired and the deal was declared off.

Old material was in great demand after the boom began and prices rapidly went skyward. New Bessemer melting stock that sold as low as \$11 in January advanced in greater proportion with the finished material, and for the past few months has sold at the average price of \$27. Basic open-hearth scrap, which opened the year at \$12, advanced to \$28 and \$30. Old iron rails, which were quoted in January at \$14, brought as high as \$30 and \$32 during the last quarter. Old steel rails which sold at \$10 advanced to \$22 and \$24. One of the peculiar features of the market during the summer months was the putting down of new steel rails that cost \$16.50 a ton and the sale of the old ones at from \$4 to \$5 a ton higher than the cost of the new, while old iron rails brought nearly double the cost of new steel rails.

The coke producers also participated in the high prices. At the opening of the year furnace coke sold at \$1.60 a ton at the ovens and the price quoted for December was \$3.

The total production of Bessemer pig iron at all the furnaces in Allegheny County during the year was 3,493,500 tons, and with the additional furnaces that will be in operation next year the capacity will be 3,913,500 tons. The output of steel is given as follows: Carnegie Steel Company, 3,000,000 tons; Jones & Loughlins, 480,000 tons; Oliver & Snyder Steel Company, 180,000 tons; Shoenberger Steel Company, 360,000 tons. The two last named concerns are now in the American Steel and Wire Company.

LEAD IN 1899.

The production of lead in the United States in 1899 is given in the following table, in short tons of 2,000 lbs.:

	1898.	1899.	Changes.
Soft lead.....	50,468	40,480	D. 1,988
Desilverized lead.....	257,573	243,384	D. 14,189
Antimonial lead.....	9,643	7,174	D. 2,469
Total production.....	317,684	291,038	D. 26,646
Deduct lead from foreign ores and bullion ..	89,209	78,035	D. 11,174
Lead from ores mined in U. S.....	228,475	213,003	D. 15,472

The total production for the year, including that from foreign ores, is divided as follows: Soft lead, 40,480 tons; desilverized, 243,384 tons; hard or antimonial lead, 7,174 tons. Of the production from foreign ores, about 1,000 tons were hard lead and 77,035 tons desilverized lead, so that the production of the last named description of metal from domestic ores was 166,349 tons. The decrease in soft lead was chiefly in the Joplin District, and was due to the greater demand for zinc ores in that district, which resulted in some neglect of the lead output. For the falling off in desilverized lead there were two special causes, the more important being the strike of the smelter workmen in Colorado, which almost stopped production for a considerable time. The other was the labor trouble in the Cœur d'Alene District in Idaho, which resulted in the closing down for a time of one of the principal mines, and of the partial stoppage of others for several months.

The reduction in lead from foreign ores was chiefly due to shorter supplies of ores and base bullion from British Columbia, which was chiefly the result of the complication in the Canadian tariff. The receipts of lead bullion from Mexico to be refined in the United States continued very large.

The conditions of the lead supply, especially in the second half of the year, showed in a very marked way the effect of the consolidation of all of the principal smelters into the American Smelting and Refining Company. The policy pursued by that company was generally a wise one, and its effect was shown in the market conditions. At the beginning of 1899 there was a very large accumulation of lead held for speculative purposes, both by first hands and by dealers. These stocks were at least 50,000 tons, while we believe also that some of the large consumers had much greater stocks of pig lead on hand than is usual with them at the opening of the year. The strikes in Colorado, in the Cœur d'Alene, and also in British Columbia, restricted production largely. During the smelter strike in Colorado it became quite uncertain whether the production would equal the consumption, and it was the belief of many who were well posted in the market that we would be obliged to import metal. The officers of the American Smelting and Refining Company, however, having naturally wide and accurate information of the conditions, decided that this would not be necessary, and made it known that they could continue to supply all demands, thus reassuring consumers. If this policy had not been adopted it is very probable that prices would have been forced up beyond the importation point, and a sufficient amount of pig lead would have been imported, not only to supply immediate needs, but to have constituted a surplus which would have depressed prices to an abnormal degree.

Again, it has been quite customary in the past for buyers to remain generally out of the market, after the fall trade is supplied, sometimes, indeed, until after the close of the year. During this period large supplies would, of course, accumulate in the hands of refiners, and they have often forced sales and depressed prices. The American Company, however, was able to hold its stocks, and also to let buyers understand that there would be no pressure to sell. This encouraged earlier buying, and, coupled with an unusually large consumptive demand, almost exhausted accumulated stocks, and even made it difficult to fill orders as promptly as desired.

It must be admitted that this policy is shown by its results to have been a judicious one, and upon the whole beneficial to consumers as well as to producers.

The demand for lead in Europe by consumers was large throughout the year, and was met in part by the exports of Mexican lead, refined here in bond; in part by the unusually large Spanish production, and in part by the shipment to Great Britain of large quantities of lead from the Broken Hill mines in Australia, which have heretofore marketed most of their product in the East.

The New York Lead Market in 1899.

Generally speaking, the conditions of trade as bearing upon the lead market were very satisfactory during the year, and the market had a healthy tone. It is true, some of the manufacturers complained of the higher prices established and of the difficulties encountered in selling their products at a profit, but unquestionably, consumers will soon be accustomed to the high range of values.

The newly formed American Smelting and Refining Company, which controls all the lead refining works, with the exception of those of the Balbach Smelting and Refining Company, M. Guggenheim's Sons, the Puget Sound Reduction Company and the Selby Smelting and Lead Company, exerted its influence during the second half of the year to prevent wide fluctuations, thus giving the market a stability such as it has scarcely ever possessed. Naturally, this policy at times clashed with the interests of the heaviest consumers of their product—the National Lead Company, controlling the white lead business; the Shot Combine, controlling the shot lead business; the proposed Plumbers' Supply Company, controlling the plumbers' supply business. By adopting the policy of concentrating their buying, these concerns would, under ordinary circumstances, be able to force the producers to come to them, thus enabling them to buy at such times as might suit them best. However, it is to be expected that in the course of time matters will shape themselves in such a way as to be satisfactory to all concerned.

In how far the new combination and the higher range of values will tend to stimulate outside production, is difficult to foretell. The price of silver having remained steady in the neighborhood of 60c., the opening up of new silver mines producing lead as a by-product was not encouraged. We have already pointed out in one of our former reviews, the large possibilities of Missouri as a lead-producing center. Not only did the mines in that State increase their output during the present year, but prospecting was carried on actively with the result that a great many new producers have sprung up and the probability is that next year their output will be felt even more.

Another feature which is worth mentioning is the fact that while in former years the possibility of foreign lead imports always hung over our market as a menace, practically every pound of lead refined in bond in the United States was this year again exported. Thus this industry continues without any detriment to the home producer, while it enables our refiners to compete with Europe, not only for the Mexican, but also for the British Columbia business.

January opened with an unusually good demand for that season of the year, and notwithstanding the fact that supplies were coming forward more liberally than for several weeks previous, values improved, 4½c. being realized toward the end of the month.

Heavy fluctuations in the Eastern markets must be reported for the month of February, while in the West the movements were not quite so erratic. Quotations ranged from 4½c. to 4¾c.

During March and April the market ruled rather quiet, consumers holding back with orders, in spite of the fact that the majority was only poorly supplied and business prospects very good. It soon became apparent that large purchases would have to be made in the near future and this, coupled with the incorporation of the American Smelting and Refining Company, caused an upward movement, which, however, did not become pronounced until about the middle of July.

The unfortunate troubles in the Coeur d'Alene District, where the owners of lead mines have had so often to suffer from vexatious demands of labor unions, and the strike in Colorado, went far toward increasing the strength of the article.

In spite of the fact that the smelters in the Colorado District had voluntarily agreed to advance wages 10 per cent., the labor unions in that State ordered a general strike, demanding a reduction in the working shifts from 10 to 8 hours a day. The matter was finally decided in favor of the smelters, the eight-hour law having been declared unconstitutional.

In the meantime production had been interfered with to a very large extent, stocks diminished rapidly, and those consumers who held back with purchases in the hope of getting in later on at lower prices, were sorely disappointed. Quotations crept up from month

AVERAGE MONTHLY PRICES OF LEAD IN NEW YORK.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
1895.....	Cts. 3-10	Cts. 3-12	Cts. 3-12	Cts. 3-08	Cts. 3-16	Cts. 3-25	Cts. 3-25	Cts. 3-50	Cts. 3-35	Cts. 3-33	Cts. 3-25	Cts. 3-22	Cts. 3-23
1896.....	3-08	3-19	3-14	3-07	3-03	3-03	2-96	2-73	2-77	2-80	2-96	3-04	2-94
1897.....	3-04	3-28	3-41	3-32	3-26	3-33	3-72	3-84	4-30	4-00	3-76	3-70	3-58
1898.....	3-65	3-71	3-72	3-63	3-64	3-82	3-95	4-00	3-99	3-78	3-70	3-76	3-78
1899.....	4-18	4-49	4-37	4-31	4-44	4-43	4-52	4-57	4-58	4-58	4-58	4-64	4-47

to month, 4.55c. being reached in August; 4.57½c. in October; 4.60c. in November; 4.65c. in December, and even then it was at all times very difficult to get metal for prompt delivery.

At the end of the year, we find lead in a stronger position than for a number of years past. There are no reserve stocks of refined lead worth speaking of; hardly anything is in store at New York, Chicago or St. Louis; at the refining and smelting works the same state of affairs exists, nearly the entire production being shipped from day to day as it becomes ready for the market. Considering that the business community expects the volume of trade during 1900 to equal if not surpass that of the current year, the outlook for a further healthy development of the lead industry in all its branches is certainly a bright one.

The London Lead Market in 1899.

The year began with a marked improvement in this article, in common with other markets. Consumers had abandoned their hand-to-mouth policy and were buying freely at the parity of about £13 7s. 6d. for soft foreign and £13 10s. English. Heavy arrivals were coming forward and fetched good prices at first, while speculators bought good quantities for forward delivery. These arrivals, however, soon began to weigh upon the market, and from £13 15s. prices dropped again to the above level.

The speculative demand then assumed larger proportions and early in February the price advanced quickly to £15 10s., but the cessation of this demand and further heavy arrivals, which were pressed for sale, unsettled matters, and £14 5s. and £14 10s. ruled for soft foreign and English lead, respectively.

A further decline brought more demand from consumers, who were poorly supplied, but the article was neglected by speculators and the value fell, early in March, to £13 17s. 6d. The tone then improved in the comparative absence of sellers, and £14 5s. to £14 7s. 6d. were paid. The American also held for higher values and £14 10s. for soft foreign ruled during the first half of April. The French Government bought good quantities. At this level, however, speculators began to realize their holdings and the market suffered to the extent of 5s. or so.

Business during May was very small indeed and £14 2s. 6d., or less, was pretty generally accepted, but the settlement of a strike in the building trade brought a firmer feeling in June and consumers bought quite freely at about £14 5s. A scarcity in the London supplies brought a further advance, and prices were quoted firm at £14 7s. 6d. to £14 10s.

A strike among Colorado producers and small arrivals in this country contributed further to the firmness of the market in July. Soft foreign fetched £14 10s., and still better prices were obtained for immediate delivery. American advices came very strong, though the strike was terminated by the end of July and might have been regarded as the precursor of more plentiful supplies, and prices were well maintained on our market.

A continued absence of sellers in August further strengthened the position and consumers' business became quite active at the higher values; £15 was reached for English and £14 18s. 9d. for foreign. The arrivals continued on a small scale in September and consumers, being still badly covered, had reluctantly to pay still higher values. By the end of the month there was quite a famine, owing partly to the difficulty of getting deliveries from Spain, and spot lead fetched about £16, while forward lead was nearly 10s. lower.

October brought no relief, and even £17 was paid for spot lead, but this price scared off consumers somewhat, who confined their purchases to immediate requirements. Continental sellers were, however, attracted by our figures, and their freer offerings brought about a more normal state of affairs, but the market remained very firm throughout the month and again reached £16 17s. 6d.

Renewed demand from consumers in November, and a continued scarcity of spot material, caused a further advance to £17 12s. 6d., but the famine was then temporarily relieved by some heavy arrivals and spot was quoted at £17 5s. Arrival lead fetched £16 10s. to £17 and English £17 to £17 5s. At the end of the month the scarcity was felt more keenly than ever and the tendency was strong and upward. Consumers now bought very freely, with apparent willingness to pay the higher values, especially for early delivery. The Government was an important buyer.

After a temporary reaction, prices were firmer again in December at £17 2s. 6d. to £17 12s. 6d. for foreign lead; £17 15s. was then paid for spot, but owing to the near approach of the Christmas holidays the

demand fell off, cold weather restricted consumption, and prices became easier at about £16 7s. 6d. for soft foreign, with English brands at £16 12s. 6d. to £16 15s.

NICKEL IN 1899.

The production of nickel in the United States continued to be as heretofore, made chiefly from Canadian ores and matte, only a very small quantity being made from ores mined in the United States. The production of the metal in all forms is shown in the following table in pounds:

	1898.	1899.	Changes.
From Domestic Ores:			
Metallic Nickel.....	11,145	22,500	I. 11,355
From Canadian Ores:			
Metallic Nickel.....	3,611,357	2,987,122	D. 624,235
Nickel in Salts.....	3,576,427	5,012,425	I. 1,525,998
Totals.....	7,138,929	8,052,047	I. 913,118

The ores from which the domestic nickel was refined came from the Mine la Motte in Missouri. The old mines in Lancaster County, Pennsylvania, are no longer worked, and the discoveries which were reported in previous years in Nevada and Oregon have not proved of sufficient importance to warrant further exploration or development. In the Sudbury District in Canada operations have been very active indeed. Many new locations have been made and new mines opened. Purchases of property have been made not only by the American companies but by the Vivians, of Swansea, in Wales, and the Mond Syndicate, of London. It is still the practice in that district to convert the ores into matte, which is shipped either to the United States or Great Britain for refining.

Early in December the Ontario Government issued an Order in Council directing that no further grants of land containing, or supposed to contain, nickel shall be made, except on the condition that the ores mined shall be treated and refined in the Province. It is also proposed to open negotiations with the British Government for the reservation of all nickel deposits as yet ungranted for Government use. The Ontario Government has also requested the Dominion authorities to make operative the export duty on nickel in ores and matte which was authorized by the Dominion Parliament a year ago. The object of this is, of course, to compel the establishment of refining works in the Province.

The Nickel Market.—The demand for nickel during the earlier part of the year was a very steady one. The use of the metal for various purposes increased slightly, on account of the high price of copper; but its chief use continued to be in the manufacture of nickel steel, which is in great demand for certain industrial purposes where a very hard, tough metal is needed, as well as for the manufacture of armor plates. Nearly all the leading naval nations of the world have now adopted nickel steel for that purpose, and as the construction of warships continues to be an important industry, in spite of peace congresses, the nickel market was generally active. Up to October, however, there was little change in prices, the New York quotations remaining steady at about 35c. per lb., for large lots, with a corresponding increase for smaller orders. Late in October there was a marked increase in demand with a scarcity of supply for early delivery, and the quotation in New York advanced for 40c. per lb. for large lots, and from that up to 45c. for smaller orders. The year closes with these prices in force, and with a strong probability of a further increase at an early date.

QUICKSILVER IN 1899.

As in previous years, almost the entire production of quicksilver in the United States came from the mines in California. The production of these mines for the 11 months ending with November is shown in the accompanying table.

It is exceedingly difficult to estimate the closing month of the year, as at some of the mines there is a practice of rushing in an unusual quantity in the last month, while at others the close of the year is frequently made the occasion for repairs and overhauling the furnaces, so that the production of that month will fall off.

Outside of California the only production reported is 261 flasks from the Texas mines. The Oregon prospect, about which the promoters put forth such glowing accounts last year, has apparently been abandoned, and nothing was done there in 1899.

The California mines generally did well throughout the year, and nearly all of them have been enabled to pay regular dividends. This is especially the case with the group of mines in Napa County, which is owned by Boston parties, and which includes the Napa Consolidated, the Aetna, New Idria and the Boston Quicksilver Mining Company—the last named being a new company owned by the same parties as the other three. Various sensational articles have been published in California newspapers about the purchase of the Almaden and the Guadalupe Quicksilver mines by the Rothschilds, but these are without any substantial foundation in fact. It is understood, however, that the Guadalupe Mine, which has been idle for nearly 15 years, is to be put in operation again, and the engineers are now engaged in preparing plans for the repair of the old workings and for new developments. No other changes of importance can be reported in the California mines during the year.

Foreign Production.—The Almaden, the Porvenir and other mines in Spain have been actively worked during the year, but it is understood that no increase in production has been shown over the previous year. The same thing may be said of the Idria mines in Austria, and of the Italian mines. In Russia, our St. Petersburg correspondent reports that the mines of Auerbach & Company produced during the 11 months ending with November 19,760 poods (323,670 kgs.) of quicksilver, and that the production for the entire year was about 22,000 poods (360,360 kgs.). The operations at these mines are being gradually extended.

The exports of quicksilver from all United States ports for the 11 months ending with November reached a total of 1,224,607 lbs., which

compares with 938,704 lbs. in 1898 and 951,575 lbs. in 1897. Nearly all of these exports are made from San Francisco. A feature of the year's trade was the shipment of several consignments, making 4,000 flasks in all, to China. That country has not purchased any quicksilver from us in several years, and these exports may be regarded as the revival of an old trade. Another feature was a small shipment made to Vladivostock, which, it was understood, was intended for use in the mines in the neighborhood of Blagovietschenk in the Amoor Valley. This may be considered as the beginning of a new trade with the Siberian mines, which may assume large proportions later.

Messrs. William Sargent & Company's circular gives the total imports of quicksilver into London for 1899 at 52,011 flasks, being 820 flasks less than in 1898. Of the year's imports, 45,729 flasks came from Spain, 6,202 flasks from Italy and 80 flasks from other countries. The last named item included a few flasks from Borneo, where a small production is reported, the metal being shipped chiefly to Amsterdam. The exports from London were 31,903 flasks, leaving a balance of 20,102 flasks consumed in Great Britain.

Prices.—The conditions of the quicksilver market during 1899 were somewhat peculiar. At the beginning of the year the stocks both in this country and in Europe were unusually light. The contracts for delivery during the year were fully up to the production, if they did not exceed it, and the consequence has been a shortage of supplies in

CALIFORNIA QUICKSILVER PRODUCTION, 1899.

Month.	New Almaden.	Napa Con.	Mirabel or Standard.	Elma.	Great Western.	Great Eastern.	New Idria.	Altoona.	Abbot or Empire.	Readington or Boston.	Knox or Manhattan.	Suphur Bank.	Total.
Dec., 1898.....	490	600	370	98	170	400	244	175	143	.....	.....	.....	2,690
Jan., 1899.....	490	600	300	80	165	400	215	.....	90	76	.....	.....	2,395
February.....	425	600	300	90	225	400	225	47	85	90	.....	.....	2,487
March.....	425	500	300	100	210	400	223	21	70	38	.....	.....	2,287
April.....	475	435	290	100	127	400	211	6	132	.....	.....	.....	2,146
May.....	400	465	340	150	170	400	190	.....	181	22	.....	.....	2,318
June.....	350	550	300	182	76	400	313	40	40	32	.....	.....	2,283
July.....	350	405	300	160	104	400	284	18	.....	63	100	.....	2,184
August.....	350	435	300	119	230	400	231	42	.....	27	35	.....	2,229
September.....	300	415	290	137	228	400	305	24	30	43	51	.....	2,393
October.....	300	485	247	141	194	400	300	13	85	.....	21	.....	2,626
November.....	300	450	61	400	157	205	317	22	75	9	68	.....	2,444
Total, 1899.....	4,595	6,000	508	3,870	1,523	2,104	4,780	3,058	233	963	543	275	28,452
Total, 1898.....	5,875	6,850	108	3,450	1,128	1,704	5,000	4,032	189	990	790	324	30,346

the face of increasing demand. In London it has been difficult to obtain metal for spot or early delivery except from second hands, at a premium, and in this country the same condition has occurred.

In San Francisco the lowest quotation given was early in the year, when sales were made at \$40 a flask for home delivery and \$33 for export. From February on there was a steady rise in prices throughout the year, the highest point reached being in November, when large lots sold at \$51.50. The New York price followed very nearly the same lines, sales having been made early in the year at \$41 for home use and \$39 for export, while in the closing weeks of the year the quotation was \$51 for large lots and from \$52.50 up to \$55 being asked for small quantities. In London the price rose from £7 15s. in January to £9 12s. 6d., which is the closing quotation. There seems to be every prospect that prices will continue fully as high through the first part of the new year.

TIN IN 1899.

There was no tin produced for the United States in 1899, and as in previous years, we have continued entirely dependent upon foreign markets for our supply. This has been largely owing to the prosperity of the tin-plate business throughout the country and the large scale on which that business is now carried on. The imports of tin into the United States for the 11 months ending with November were 68,215,999 lbs., which compares with 59,210,437 lbs. in 1898, and 51,158,289 lbs. in 1897. A notable feature in this trade during the last two or three years is the extent to which importations are made direct from the producing countries. A few years ago the greater part of our tin was received from London and Amsterdam, but in 1899 65 per cent. came directly from the East Indies. The larger part of the United States supply comes from the mines of the Malay Peninsula, and is classed under the trade heading of Straits tin. A little is received here from Australia, and a small quantity comes to the Pacific Coast from the Banka and Singkep mines. A little Billiton tin is also received here from Holland, but the quantity is yearly diminishing, and the Straits Settlements are looked to as our principal source of supply.

The following table shows the exports of tin from the Straits Settlements for 10 months ending October 31st, in long tons of 2,240 lbs.:

	1897.	1898.	1899.
United States.....	16,539	19,023	19,721
Europe.....	18,388	18,879	18,315
India and China.....	2,724	2,174	1,063
Totals.....	37,651	40,076	39,099

The total tin supply of the world in 1898 was estimated at 71,365 long tons, of which about 60 per cent. came from the Malay Peninsula. Although demand has been active and prices high, as is shown by our market reports below, the increase has not been very large, and the total output for 1899 did not exceed 71,500 long tons. In 1900, however, a considerable increase in production may be expected in Straits tin and also from the Banka mines, while there has been some opening of new mines in Tasmania which promise well for the future. The disturbed condition of affairs in China has been to some extent responsible for the slow increase in production, as nearly nine-tenths of the tin ore produced in the world is mined by Chinese laborers, but toward the end of the year it is reported that a considerable number of miners have gone from China to Singapore and to the Dutch East Indies, so that an increase in production shortly may confidently be looked for.

The visible stocks of tin on December 31st are reported as follows, in long tons of 2,240 lbs.:

	Store.	Afloat.	Total.
London.....	6,698	3,400	10,098
Holland.....	1,869	1,342	3,211
United States, excl. Pacific ports.....	1,994	2,310	4,304
Total.....	10,561	7,152	17,713

The total visible supply on January 1st, 1900, shows a decrease of 2,588 long tons, as compared with January 1st, 1899.

The course of production of tin-plates in the United States is referred to in our iron and steel markets. The increase has been very large, and in consequence the imports of tin plates have decreased considerably. For the 11 months ending with November the total was 121,265,456 lbs., against 141,787,069 lbs. in 1898, and 170,986,290 lbs. in 1897.

The New York Tin Market for 1899.

The year just ended will long be a memorable one in the annals of the tin trade. The advance in values which took place in 1898 continued at a much accelerated pace amid violent fluctuations. The consumption was very large. Production increased but slightly. Speculation was rampant. The main features of the market were an increasing consumption in the face of constantly advancing prices, and the daring and successful speculative operations carried on in London. In spite of the great stimulus of high prices, production did not increase much. Last year 68,800 tons were produced, and we estimate this year's production to be about 71,500 tons. The average price of tin in New York during 1898 was 15.70, while this year we figure it to be about 28 cents. Our market has, as heretofore, followed that in London, though at frequent periods supplies were exhausted, and spot and early deliveries sold at handsome premiums. It also happened that while the London supplies were meager, stocks at New York had accumulated, causing prices here to go far below the import parity. While in these instances the two markets did not move together, they did so most of the time. We must, therefore, keep the London market well in view in reporting the New York Tin Market during 1899.

When the year opened tin was selling here at 19c., and in London at £86. The demand was excellent, stocks throughout the world were small. The European operators soon recognized the strong statistical position and bought heavily, forcing the large short interest which existed at that time to cover. In consequence, the market rose to 25c. New York, and £110 London. The American consumption was rapidly increasing, and the stocks in this country were much depleted early in the month with the result that spot tin ruled at ½c. premium until the end of the month, when larger arrivals reduced it somewhat. The world's visible supply decreased during January, 1,200 tons.

At the beginning of February the London market went to £114 2s. 6d., but now a reaction set in, the metal selling down to £105. At New York the metal sold at 23½c. Wide and violent fluctuations followed and consumers held off, but toward the end of the month they again had to buy, and prices crept to 24c.

During March business here was of small volume. Consumers were rather skeptical as to the continuance of the high values which had been established, and it was only toward the end of the month that the market became active. Meanwhile prices fluctuated widely both in London and New York. The shipments from the Straits had not increased, and early in April the prices rose again to 25½c. in New York and £113 7s. 6d. in London.

Arrivals at New York during April were rather heavy, and the premium which had existed on spot tin was totally wiped out. It was now perceived that in spite of the fact that the metal had risen 50 per cent. in value, consumption was not being affected thereby, and in fact the visible supply during April was actually decreased by about 1,147 tons.

During May our market was exceedingly quiet; stocks were rather large. The London market fluctuated in an uncertain way and at the close of the month the metal was selling here at 25½c.

Early in June it appeared that visible supplies had increased slightly as compared with those of January 1st, and the trade doubted the maintenance of the high prices which had been established. It certainly seemed that with supplies more than adequate prices would suffer. In London fluctuations were wide. At the end of the month, however, a bull movement was started with the result that prices advanced constantly, reaching £128 5s.

Till July our market responded but sluggishly to London fluctuations owing to the plentiful supplies on hand; but about the middle of July it went to 28¼c., consumers having exhausted their stocks.

During the six months that had passed the increase in consumption had taken place principally in America and England. On the European continent deliveries from warehouse and imports had actually decreased over 5,000 tons. This apparent reduction, however, appears to have been in consequence of consumers using up all stocks they were in the habit of carrying in their mills. It developed later in the year that the actual amount of consumption there had not changed, for during the next few months it increased to the extent it had fallen short, and it then became apparent that everybody had been working without stock.

July witnessed tremendous fluctuations in London, due primarily to speculative, and then to consumptive purchases. The metal sold up to £146 in London and 32½c. at New York.

During August the London market fluctuated continually, but the New York stocks, in consequence of the heavy arrivals, being again replenished, the market here did not follow the London changes closely. The market here fluctuated from 30c. to 33c.

In September the market moved in an uncertain way, but the undertone was decidedly firm. Spot tin ruled at a premium. At the same time the London stock was being reduced owing to the fact that heavy shipments from the Straits were being made direct to New York. Their arrival at the middle of the month gave the New York market a rather weak tone, but at the end of the month a strong speculative movement both here and abroad advanced the prices to 33c., while London touched £150. The September statistics showed an in-

crease in the visible supply of 1,100 tons, which made consumers rather cautious and bull manipulations conservative.

During October the market was dull and weakish. At the end of the month, amid great excitement and wide fluctuation, London broke. In one day over £5 were lost. At New York tin sold for 30¼c., and at the end of the month the metal sold for 30½c. Meanwhile the usual Dutch sale had been made for 400 tons more than the ordinary quantity, and this disheartened the bull manipulators, as well as the consumers in general.

Prices in November started on a downward course by leaps and bounds, and 26c. for New York and £118 for London was reached in the first half of the month. The London market had actually declined about £29 in two weeks, and the New York market about 6c. All sorts of rumors were in circulation, one of them to the effect that a stock

AVERAGE MONTHLY PRICES OF TIN IN NEW YORK.

Year.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	
1895.....	13'25	13'35	13'20	14'00	14'05	14'15	14'40	14'35	14'45	14'65	14'40	13'91	14'05
1896.....	13'02	13'44	13'30	13'34	13'54	13'59	13'63	13'49	13'15	12'94	13'09	12'96	13'29
1897.....	13'44	13'59	13'43	13'34	13'44	13'77	13'89	13'80	13'98	13'88	13'79	13'71	13'67
1898.....	13'87	14'08	14'38	14'60	14'52	15'22	15'60	16'23	16'03	17'42	18'20	18'30	15'70
1899.....	22'48	24'20	23'82	24'98	25'76	25'85	29'63	31'53	32'74	31'99	28'51	25'88	25'12

held back by the Chinese at the Straits was being forced upon the market. However, the movement was due to the decrease in consumption and slight increase in production.

The third week in November witnessed the most violent fluctuations in London, with the result that business here was practically at a standstill. At the close of the week tin in our market was selling at 28c. and in London at £128. At the end of the month the market was about 27½c. for spot and 27c. for futures.

The unfortunate trouble in the Transvaal and the reverses of the English, coupled with a tight money market, played sad havoc with the market during December. The consumptive demand showed a considerable falling off, most of the tin plate mills being closed down for inventory and repairs. It was not until the last few days of the month that a somewhat better feeling prevailed, and the year closed with Straits in carload lots selling at 25c. for spot, with furnace at 24c.

The London Tin Market in 1899.

The tin market, so often a source of bewilderment to onlookers, must have astonished the world at large in a more than ordinary degree at the beginning of 1899, when prices rose by leaps and bounds, and large transactions took place amid the wildest excitement. The phenomenal advance of £23 per ton during the month of January was a circumstance which many found it difficult to explain, but not only was the article in an exceptionally strong position, in the relation of supply and demand, but other powerful forces were at work which could hardly have failed in their object.

As in copper, America led the way in a great speculative movement, and the continual rise of prices in the States tended to make operations in our market bold. A large business was done in "options," at full values, and the optimism of the bull party knew no bounds. Probably the most important feature of the market was the continual and steady decrease of stocks, coupled with a growing consumption with a production which did not increase, and here the great strength of the market really lay, as this state of things had been going on for some considerable time, and the "boom" in America naturally brought matters to a crisis. The values of cash and forward tin at the opening were only £87 and £88 respectively, but at the end of a week nearly £6 had been gained. A further rise of £4 induced some profit taking and brought a temporary reaction, but the close of January was strong at £111 10s. cash and £111 three months, the backwardation being caused by some free offerings of forward tin. The turnover was about 23,000 tons for the month. The stocks in Europe and afloat thereto at the beginning of the year were 15,666 tons, being a decrease of 1,934 tons on the previous month's supplies.

February marked a keen contest between the bull and bear parties, which swayed the market like a pendulum. Strong buying continued, until £115 was paid, but a weaker tendency in America then became manifest and the bears seized the opportunity they had long been waiting for and sold large quantities of forward metal at declining prices. These warrants, however, were boldly taken up by the bulls, who made no effort to stay the decline. Their faith in the market was justified, for no sooner had the selling ceased when a smart recovery took place, prices rising from £104 10s. to £108 10s. for three months in one day. On further buying £111 15s. was reached, but here the bears renewed their efforts and hammered down the market most effectively to the extent of about £7. At one moment the backwardation on three months tin was as much as 45s. A better feeling in America then asserted itself and once more £110 was paid, but the tone was unsettled, in the expectation of heavy shipments from the Straits, and the bulls having relaxed their efforts, the close was quieter at £108 cash and £107 15s. three months. The consumptive demand at this time was good.

The shipments from the Straits during February were 4,600 tons, which was less than had been expected, and with the aid of better reports from America the market was strengthened, in the beginning of March, against the influence of free selling, which caused but temporary drops. Later in the month American purchasers came in, while the bear selling practically ceased, and the market assumed a sounder appearance, with a contango on three months tin; £109 was paid for cash, but the speculative interest became less strong, and after further unimportant fluctuations the close was steady at £109 12s. 6d. cash and £110 three months. Consumption, both in Europe and America, was very good and supplies were steadily falling off.

In April there was more interest shown in the article, consumers and speculators alike buying in anticipation of higher values. This improved prices, which reached £113 7s. 6d. early in the month. A further

advance, as well as some excitement, was caused by an enquiry in the market for 2,500 tons from consumers who were stated to be very large buyers for a new invention, prices rising to £117. No actual business seems to have resulted from the enquiry, but the market remained strong owing to the steady rise in silver and to the general opinion then held that the article was extremely sound on its own merits. The bears were defeated in their efforts to weaken the market, and the high price of £120 was reached, but this offered too strong a temptation to some holders, who sold freely, and prices fell about £2.

May opened with good statistics, which showed a decrease in the supplies of 1,277 tons. This encouraged large speculative purchases, which brought prices to £120 10s., but a reaction in the silver market had a contrary effect, while free offerings of forward metal by prominent bear operators further tended to depress the market, which fell nearly £5. Other operators were, however, equally energetic, while American advices were of a most optimistic nature, but, being pulled both ways, the market was irregular, and the month closed with values at £17 18s. 9d. cash and £118 10s. three months.

June began with a quiet and somewhat depressed market, but with a strong undercurrent which made itself felt as soon as any support was forthcoming. Good prices were realized at a Banka sale in Amsterdam. This, and the strong statistical position, acted partly as a counter influence against some heavy realizations by outside holders. A new speculative element then asserted itself and gave the market a very strong tendency, values rising to £120 17s. 6d. for cash and £122 for three months. Prices in the East were also higher and the supplies continued to fall off.

In July both consumers and speculators bought liberally and prices advanced from day to day, till £128 cash and £129 3s. 9d. three months were quickly reached. Attention was then concentrated upon the article simultaneously from London, America and the East, and a very large business was done, at advancing prices, amid all the excitement of a boom. Each week's advance eclipsed the former one, and by the end of the month prices had reached the sensational level of £144 10s. cash and £146 three months. The efforts to increase the production at this time were handicapped by the extreme scarcity of Coolie labor in the East, and this was not without its effect upon the market.

Early in August the boom reached its climax, with forward metal at £147, and realizations on a large scale were then made, causing a drop of nearly £3 in a few days. America, however, stimulated the market with large buying orders, and values rose again to £146 cash, but home operators again seized this opportunity to realize their holdings and violent fluctuations followed. After touching £139 12s. 6d. the market improved somewhat and closed at £142 16s. 3d. cash and £143 forward.

In September the strength of the statistical position became a factor which was apparent to all. The supplies were continuing steadily to fall off and there was little hope of an increased production for some time to come. Strong reports from America came forward and a steady upward movement seemed to be in progress when a temporary relapse took place, chiefly under the influence of politics, the outbreak of hostilities in the Transvaal being imminent. Cash metal became scarce and caused a backwardation against forward tin of 15s. to 20s. In the latter half of the month, however, the market improved greatly under new support both at home and in America, and large purchases brought prices up to the highest level reached, viz., £150 15s. for cash. The close was quieter at £149 12s. 6d. cash, with forward metal at 22s. 6d. less.

In October the contango between cash and three months tin was restored, the dearth of money inducing sales of the former position. The statistics for the latter half of November were not so favorable as had been expected, but the American stocks were believed to be much overestimated. Prices were sensitive for a time and influenced downward by cheap sales of Dutch tin, as well as the weaker tendency of other markets. The bears chose this opportunity to make a determined raid on the market, and sold aggressively, prices falling as low as £138 15s. for three months. This level, however, attracted the attention of the opposite party, whose purchases caused a recovery of £5, but under further realizations at the end of the month, prices declined again to £141 10s. cash.

The bears resumed their vigorous tactics in November and the market could no longer stand against them. Large quantities were sold at declining prices, and in the middle of the month there was a complete collapse, prices touching as low as £118 10s., but this was caused chiefly by a scare among the bulls, some of whom realized heavily. The market was not entirely abandoned, and when more courage was shown by its supporters, prices improved to £132 cash. It will be seen from these figures that the fluctuations were extremely violent, but the market was so sensitive that almost every transaction changed the level one way or the other. The lowest figures brought out some consumers' demand, as well as some new speculative orders, but the free selling continued from all sides, the high prices in this country offering temptation to sellers in the East. At the end of the month, however, the tendency was steadier at about £125 to £126.

In the beginning of December it looked as if prices were going to be more steadily maintained, but cheap offers from the East had a bad effect, and when £120 for cash and three months had been reached the sudden failure of a broker, whose commitments were said to be about 2,000 tons, caused most violent fluctuations, prices falling in two days to £108 for spot. Most firms on the Metal Exchange were affected by this failure and were anxious to resell the quantities suddenly thrown on their hands. Strong efforts, however, were made to check this decline and resulted in an improvement to £114, but this was followed by a further reaction, owing to realizations, and £109 5s. cash and £110 2s. 6d. three months were accepted. The same influences which depressed the other markets, particularly the stringency of money, helped to weaken the position of tin, which might otherwise have borne this failure more firmly, and values fell to £103 for cash and £104 10s. for forward. Renewed buying from America, coupled with better news from the Transvaal, gave the market a firmer tendency at the end of the month, and the year closes with spot selling at £111 15s., three months at £112 15s.

ZINC IN 1899.

The production of zinc ores in the United States during the year just closed has largely exceeded that of any previous year in our history. There was an increase in all the mining districts, while the Joplin Region was the center of a phenomenal activity, which served to increase the production very considerably, although its effects will not be apparent until the current year. The smelters have likewise been very active and have shown considerable advances in their output. The production of spelter or metallic zinc is given by districts in the following table, the figures being in short tons:

	1898.	1899.	Changes.	Per ct.
Eastern and Southern.....	7,805	8,815	1,010	13.0
Illinois and Indiana.....	46,693	51,388	4,695	7.9
Missouri-Kansas (Joplin) ..	59,606	76,593	16,987	28.3
Total.....	114,104	135,793	21,692	14.9

It will be seen from this that all districts shared in the advance. Thus the Eastern and Southern smelters show a gain of 1,010 tons, while the works in the Illinois and Indiana District exceeded their production of 1898 by 3,695 tons. In the Joplin District, which includes the mines in Southwest Missouri and Southeast Kansas, the gain was 16,987 tons, or in more than the same proportion as in the Illinois and Indiana districts. Although the ore is produced in both Missouri and Kansas, by far the greater part of it is now smelted in Kansas. Owing to the removal of nearly all of the large plants from their former locations, to points on the Iola natural gas belt. The economy and improvement resulting from the use of natural gas in smelting, are thoroughly realized by the operators, and the Joplin plants can hardly afford to remain in locations where they are compelled to use coal in their furnaces.

In the Eastern and Southern districts there have been few or no changes to report. The New Jersey Zinc Company remains the chief producer in the East. The work is gradually being extended on its large deposits in Sussex County, New Jersey, and the Wetherill concentrating and separating plant is proving its efficiency and usefulness in separating the peculiar ores of that deposit.

In the Illinois and Indiana Districts there have been no changes of importance during the year. The strong demand for ores has somewhat stimulated the working in the old mines in Northwestern Illinois and Southwestern Wisconsin, but no new operations of importance have been opened there.

The Joplin District has been the center of attraction throughout the year, and the important changes in the conditions of mining and marketing the ores are fully explained in the letter of our correspondent below.

In addition to the production of spelter there is reported an output of 31,663 short tons of zinc oxide, or zinc white, made directly from the ore and sold for paint. This is a decrease of 1,084 tons from 1898. Nearly all of this zinc oxide was made by the New Jersey Zinc Company.

Exports in 1899 show a considerable increase as far as ore is concerned. For the 11 months ending with November the Treasury Department reports the shipment of zinc ore at 22,918 tons, against 10,254 tons in 1898. The greater part of this was from the Joplin Region, and was shipped to the port at Galveston. The Vieille Montagne Company of Belgium, with its usual enterprise, has been in the market as a buyer of ore more or less throughout the year. Exports of spelter for the 11 months show a decrease, the total being 6,511 short tons, against 9,535 tons in 1898. Late in December a large sale of metal for export was made, but this will probably be shipped during January, 1900, and does not appear on the return for 1899.

The Joplin Zinc Ore Market in 1899.

By Our Special Correspondent.

The year 1899 has been one of the most marked in the history of the Missouri-Kansas zinc mining district, and the industry has taken great strides forward in the methods of operation, the amount of money invested and the class of investors.

Zinc ore reached the hitherto unheard of price of \$55 per ton in April of this year, and the average price was \$10.10 per ton higher than in 1898 throughout the entire year. Market conditions have been disturbed from various causes and the demand for metal has been cut short by the war in South Africa, the inability of sheet-iron manufacturers to deliver sheets to galvanizers and from various other causes.

The Missouri & Kansas Zinc Miners' Association has grown into a powerful organization and has prevented a surplus from accumulating by ordering a shut down of operations on June 26th, continuing until July 10th, and again on October 1st, continuing for four weeks. In the latter fully 90 per cent. of the mills in the district participated, and by the two suspensions fully 20,000 tons of surplus ore was prevented from accumulating, with a corresponding amount of surplus metal. The price of metal fell steadily during the last six months of the year, but in spite of a falling metal market and a lessened demand for spelter, the association was able to maintain prices and only lowered the schedule when the information at their command satisfied them that they were justified in doing so, and the close of the year saw top-grade zinc ore selling at \$36 per ton when the association schedule price was only \$33 per ton for 60 per cent. ore.

During the year an effort has been made by the smelting interests to use Colorado ore in large quantities, but the experiments in every case proved disastrous owing to the refractory character of the ore and the poor quality of the metal made from it, which, in some cases, was unsalable at any price, and the experiments have been abandoned by domestic smelters, although foreign smelters contracted for and have had shipped 8,000 tons at a nominal price.

There has been during the year a good deal of agitation in favor of building smelters to be owned and operated by a stock company controlled by the producers of the district, but thus far nothing definite

has been accomplished and interest in the matter seems to have abated.

One of the direct benefits conferred by the Association on the producers of the district has been the establishment of an assay basis for selling zinc ores, and the product of most of the big mills of the district is now sold by assay, notably the Oronogo, Neck City, Aurora and Joplin ore, and the results have proved eminently satisfactory to both buyer and seller.

The prevailing high prices have greatly stimulated prospecting, as was to be expected, and an added stimulus has been given by the publication in the "Engineering and Mining Journal" last March of the Crossman drill chart showing from the results of 30 years' drilling, that of all drill holes put down to a depth of 500 ft. or more that 50 per cent. struck ore. The result of the publication of the chart is that the system of drilling has been radically changed and drilling to a depth of 250 ft. and over has quadrupled the number of discoveries of ore.

Probably \$12,000,000 has been invested in mines and mineral lands during the year. A large number of the sales are not published owing probably to the desire of the purchasers to stock their holdings away above the purchase price, and with many of the published sales no valuation is given out, but the sales actually published foot up a total valuation of \$9,682,230, and the Secretary of State for Missouri has granted during the year certificates of incorporation to 151 domestic corporations, with a total capital of \$12,256,700, and 36 foreign corporations, with a capital of \$10,350,000; a total of \$22,606,700.

Among the companies which have acquired large holdings during the year are the American Zinc, Lead and Smelting Company, whose combined properties represent an investment of \$1,200,000; the United Zinc Companies, which have invested \$642,000; the Colleys, who have placed properties to the extent of \$2,506,000; and others ranging from \$50,000 to \$300,000; these investments showing the radical change in the class of operators from the old-time hand-jig prospectors of only a few years ago.

The hand-jig system of cleaning ore has been almost entirely superseded by the modern high-power steam mill, and the demand for machinery has exceeded the capacity of the foundries and machine shops, most of whom have doubled their capacity, while numerous new ones have been erected in the last few months. It is estimated that over 400 steam plants are now in operation in the district, 50 per cent. of which have been built this year. They are distributed about as follows: Galena, 125; Empire, 10; Joplin, 75; Cave Springs, 12; Central City, 16; Webb City, 30; Cartersville, 60; Aurora, 20; Stotts City, 8; Oronogo, 24; Neck City, 3; Alba, 3; Duenweg, 10; Lehigh, 6; Spring City, 3; Wentworth, 2; Carthage, 3; and the balance scattered over the district.

The year opened with top-grade zinc ore selling at \$29.50 per ton, but it had advanced to \$32 on January 14th, sold for \$48 per ton during the week ending February 18th, and continued to advance until, during the week ending April 22d, the price for fancy grade zinc ore was \$55 per ton. It then commenced to decline slowly, reaching \$40 per ton November 4th, and touched the lowest point on November 20th, when it sold at \$32.50, from which it advanced to \$37 for the week ending Dec. 24th, and closed the year at \$36 per ton. The average price for the first six months of the year was \$35.98, and for the last six months \$41.92½, the average for the year being \$38.54.

A comparison of these figures with those for 1898, until then the greatest year in the history of the zinc and lead mining industry, shows the remarkable stride made in 1899.

Zinc opened the year in January, 1898, at \$23 per ton, and closed at \$29.50, the highest price being reached December 3d, when \$40.50 was paid for top grades. The average price for the year 1898 was \$28.44 per ton, against \$38.54 for this year. The average monthly prices paid during the two years was as follows:

Month.	1898. Prices.	1899. Prices.	Month.	1898. Prices.	1899. Prices.
January.....	\$23.00	\$32.25	July.....	\$28.00	\$44.20
February.....	22.50	43.37½	August.....	25.37	45.00
March.....	25.00	43.40	September.....	31.00	43.75
April.....	24.62	51.50	October.....	33.70	43.50
May.....	26.50	50.50	November.....	36.25	35.00
June.....	28.50	45.53	December.....	37.00	36.00

The combined value of lead and zinc ore for the year was \$10,883,628, against \$7,145,262 for the year 1898, and the increase in the zinc output amounts to 41,665,770 lbs.; but the lead output was less by 4,193,160 lbs.

The ratio of increase in the production of zinc was not as great compared with 1898 as that year was compared with 1897, when the production increased over the previous year to the extent of 114,900,400 lbs., while the comparatively small increase of 41,665,770 lbs. over last year, with the greatly increased demand and far better prices, shows that there is room for a great expansion in the zinc production without overloading the market, and the great increase in valuation tells its own convincing story of the great profits in the industry.

The wages of miners have been advanced throughout the district from 20 to 25 per cent. and the great increase in the number of mills operated has created a demand for labor throughout the district which has advanced the wages of unskilled labor to a higher point than at almost any place in the country. Ordinary labor is paid from \$2.25 to \$2.50 per day, ground men and ground bosses from \$2.75 to \$3.50 per day. There have been no labor disturbances of any kind during the year and the agreeable relations existing between employers and employees, for which the district has always been noted, was shown by the fact that the miners stayed with the ore producers' association almost to a man during the shut down and urged that it be continued until the smelters were brought to terms.

Lead Ore.—There was a falling off in the lead output again this year, due, as in 1898, to the prevailing high prices for zinc ore, and the output was less than that of last year by 4,193,160 lbs., the decrease being about 30 per cent. less than that of 1898. There is probably a surplus of a million and a half pounds which is being held for higher prices. Lead opened the year, January 1st, at \$22.75, advanced to

\$24 per thousand on January 14th, and reached \$27 February 4th, fluctuating between \$26 and \$27 per 1,000 lbs. for the balance of the year, closing at \$27.50 December 30th. The average monthly prices were as follows:

Month.	1898. Prices.	1899. Prices.	Month.	1898. Prices.	1899. Prices.
January	\$22.00	\$23.93 $\frac{3}{4}$	July	\$23.60	\$26.90
February	22 12 $\frac{1}{2}$	26.50	August	23.50	27.25
March	23 00	25.80	September	23.31 $\frac{1}{4}$	27.00
April	21.56 $\frac{1}{4}$	25.25	October	22.00	26.90
May	21.75	26.10	November	20.87 $\frac{1}{4}$	27.20
June	22.87 $\frac{1}{4}$	26.00	December	21.10	27.00

Totals.—The total output of the district, of which Joplin is the center, for the last two years, in pounds, was as follows:

	1898.	1899.	
Zinc ores	470,246,620	512,912,390	Increase 41,665,770
Lead ores	52,949,580	48,756,420	Decrease 4,193,160

The total selling price or market value of these ores in 1898 was \$7,145,262. In 1899 it was \$10,883,628, showing an increase of \$3,738,366 in the amount realized for the output in 1899.

The New York Spelter Market in 1899.

The general prosperity of the country had a vast influence upon the zinc industry, and it is not too much to say that in a certain way the trade has undergone a great revolution. While formerly the large zinc deposits in the Joplin District had been worked more or less in a desultory and old-fashioned manner, great changes have taken place, due mainly to the consolidation of smaller producers and neighboring mines, and more economical and up-to-date concentrating works.

The great profits in copper properties during the last few years finally attracted the attention of both promoters and capitalists to the zinc industry, with the result that a number of individual producers were incorporated in large and mostly financially strong companies, which were able to effect the improvements already noted above in the mine workings, hoisting and concentrating. It must be stated that the floating of similar enterprises soon proved infectious, some of them were put on the market at an inflated valuation which will hardly yield fair revenues to the respective stockholders. Most of the new companies, however, can be termed solid and good and unquestionably will be the means of encouraging the more economical treatment of zinc ores. Great prosperity has been experienced in the entire camp; a number of new mills have been started and many economies introduced.

The same must also be said of the smelting industry which had, during the few preceding years, already made great strides forward, especially since the gas-fields have been made available for the smelting of zinc concentrates, in place of coal. The saving in the cost at these newer works is material, and since a great number of them have combined into a few large concerns, the cost of smelting has been further materially reduced.

While it is most gratifying to record these advances, matters did not move as smoothly as was anticipated. The producers of ore, fearing that the diminished competition from the different smelters would work rather disadvantageously for them, united and organized the Miners' Association, whose object was to regulate prices for ore in order not to be at the mercy of the few large buyers. Such a course must strike the unbiased observer as having been fair and equitable, but, unfortunately, instead of trying to harmonize their interests, each faction—the miners and smelters—tried to get the better of the other, in consequence of which differences arose, resulting in an open war, which waged through almost the entire year. During this period, in spite of extremely satisfactory prices, the profits of the smelters were materially curtailed, especially when, during the second half of the year, there were heavy breaks in the price of spelter.

Of late, however, it appears that both factions have come to realize that they made serious mistakes, which they are now trying to rectify, and in the interest of all concerned it is greatly to be hoped that they will succeed. The smelters ought to pay a price for the ores which is fair according to the figure at which the metal can be marketed, and the miners ought to be satisfied with this and not try to establish higher values for the ores than the markets for the metal will admit. If they overstep the limits it will mean simply that consumption of spelter will suffer, and surely this cannot be to their advantage. An effort was made a few months ago by the Miners' Association to fix a minimum price for ores for a period of six months, but it was soon found that such radical measures would never lead to the desired end.

The year commenced with a firm tendency, with prices ruling at 4.85 St. Louis and 5c. New York, but then a very strong demand, especially for galvanizing purposes, started up, which rapidly drained the light stocks on hand, and prices during the month quickly advanced to 5.35 St. Louis and 5.65 New York. These rather satisfactory prices stimulated production materially and some new furnaces were blown in, but even this increased production could not meet the heavy demand, which proved so strong that prices advanced from day to day, and some belated consumers had to pay heavy penalties for not having covered their wants earlier.

By the end of February prices advanced to about 6 $\frac{1}{2}$ St. Louis and 6 $\frac{1}{2}$ New York, at which high figures orders fell off, and producers not being willing to speculate with their stocks at the high values, a sharp decline set in, which lasted fairly throughout the month of March, during which period prices at one time declined to 5 $\frac{1}{2}$ St. Louis and 6 $\frac{1}{8}$ New York.

This reaction brought about a better business and the market improved slowly during April, by the end of the month again advancing to 6 $\frac{1}{2}$ @6 $\frac{1}{2}$ St. Louis and 6 $\frac{1}{2}$ @6 $\frac{1}{2}$ New York. These proved to be about the highest prices of the year and they were firmly upheld until the end of May, when again a marked flatness became noticeable.

In June the decline became more pronounced and soon developed into a rapid and severe drop, which culminated early in July, when 5.35 St. Louis and 5.50 New York was reached.

At these figures the smelters found themselves in a piteous plight, as they had practically to sell at tremendous losses, considering the high values for ores, which kept up remarkably well. The pressure to sell grew less, and this for some little time gave a stimulus to the market, but it was soon observed that the galvanizing trade was no longer as good as early in the year.

In the beginning of September sales were made as low as 5 $\frac{1}{2}$ St. Louis and 5 $\frac{1}{2}$ New York. At these figures consumers again bought quite freely, especially when they heard that a number of furnaces had been closed down on account of their owners finding it unprofitable to produce with the ruling high prices for ores. Fluctuations were the order of the day, and it was then that the Miners' Association decided to close down the majority of the mines and hold out for ore prices, which, with the decline of spelter, had necessarily to come down, and to engage themselves not to sell any ore below \$43 for 60 per cent. concentrates. This shutting out of a large proportion of the product necessitated in turn smelters drawing their furnaces, particularly as prices for ore proved much too high to produce metal and sell it at the ruling market values.

This fight continued until the middle of November, and it was hoped—and with certain reason—that during this time the spelter market would advance, but as it is the unexpected which happens often, this did not turn out to be so, and we find that early in November the ruling values were 4 $\frac{1}{2}$ @4 $\frac{1}{2}$ St. Louis and 4 $\frac{1}{2}$ @5c. New York. The main reason for this very large drop was the enormous falling off in the demand for galvanizing purposes, which condition was aggravated during that month and culminated in the beginning of December, when prices dropped to 4.15@4.25 St. Louis and 4 $\frac{1}{2}$ @4 $\frac{1}{2}$ New York; these being the low water mark of the year.

In spite of the heavy reduction in the output, stocks accumulated, but the low figures admitted of some heavy sales to Europe, which materially

AVERAGE MONTHLY PRICES OF SPELTER IN NEW YORK.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year
	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.	Cts.
1895.....	3-28	3-20	3-23	3-30	3-50	3-65	3-75	4-15	4-30	4-10	3-55	3-49	3-63
1896.....	3-75	4-03	4-20	4-09	3-98	4-10	3-97	3-76	3-60	3-72	3-99	4-14	3-94
1897.....	3-91	4-02	4-12	4-13	4-21	4-21	4-32	4-26	4-18	4-17	4-03	3-89	4-12
1898.....	3-96	4-04	4-25	4-26	4-27	4-77	4-66	4-58	4-67	4-98	5-29	5-10	4-57
1899.....	5-34	6-28	6-31	6-67	6-88	5-98	5-82	5-65	5-50	5-32	4-64	4-66	5-75

relieved the situation, as the surplus which weighed on the market suddenly disappeared. The lower prices also attracted the attention of consumers and a good business took place, with prices rapidly advancing to 4.60 St. Louis and 4.85 New York, when all at once the stock markets became very much unsettled and money in the principal centers of the United States exceedingly scarce. Under these circumstances the advance could not be fully upheld and prices eased off, closing at the end of the year at 4 $\frac{1}{2}$ St. Louis, 4 $\frac{1}{2}$ New York.

The constant and rapid fluctuations experienced during the entire year made business very difficult indeed, and prevented profits from being as large as they would otherwise unquestionably have been, and it is sincerely to be hoped that more equitable values will rule in the near future.

The brass trade throughout the year has been good and consumed spelter more largely than perhaps during any previous year, while the consumption of sheet zinc was rather irregular and suffered frequently by the wide fluctuations in spelter. Owing to this the consumption of sheets is estimated to have been less than in the preceding year.

The London Spelter Market in 1899.

This was a rapidly rising market in the beginning of the year, when consumers bought actively and many people were providing themselves with spelter for forward delivery in anticipation of higher values. On the Continent especially there was a large demand for spelter and sheet zinc, and as European supplies were insufficient, it is scarcely surprising that 50s. per ton was gained during January, especially as the American market was also strong and advancing. Ordinary brands rose from £24 17s. 6d. to £26 17s. 6d. and specials from £24 10s. to £27.

Consumption in America was increasing to such an extent that users there made large purchases, some for very far forward delivery, and as a similar tendency prevailed on this side, prices rose steadily, and in February £28 2s. 6d. was paid for ordinaries. In Silesia many of the producers were sold out till the end of the year and Belgian supplies were falling off owing to labor difficulties.

At the higher values, in March, dealers came in and pressed sales, causing a decline of about 20s., but the second state of trade proved stronger than their operations, and with a renewed demand at the end of the month, prices rose to £27 15s. A good business in hard spelter was also done at fair values.

The market continued to strengthen in April, partly in sympathy with the rising American market, and partly influenced by a good demand for galvanized iron, which brought out consumers' orders. Supplies also continued scarce and prices rose to £28 12s. 6d., which level was maintained in spite of some fairly large offerings in May. The American market at this time was quite above our parity, precluding export business.

In June, however, some of the chief support was suddenly withdrawn and dealers took the opportunity to drive prices down to £27 5s., but this level attracted more consumers' orders and the tendency improved. The demand then fell off entirely, and on holders becoming anxious sellers, prices suffered considerably, down to £25 being accepted for ordinaries. At this level further realizations took place in July by scared holders, but on the other hand the lower figures again attracted consumers, who were badly provided, and prices rose to £25 18s. 9d. on strong buying.

The tone was very dull in August, buyers being extremely reserved. Second-hand lots were constantly pressed for sale and several large

Continental firms being also anxious sellers, values were driven down as low as £22. With dull trade on the one hand and strong American reports and some speculative buying on the other hand, prices fluctuated back and forward in September and closed at £22 10s. Specials were quoted at £23 to £23 5s.

In spite of the healthy condition of the galvanized sheet trade, which brought out some orders early in October, the market was again depressed by free sellers, who accepted down to £21 10s., and in November prices continued to drop, although the activity in the galvanized-iron trade during this month was almost unprecedented and consumers were buying more freely. This decline was owing, no doubt, to the weaker position of the American market and the probability of export trade being resumed with that country, as well as a general lack of confidence which made buyers very cautious. Ordinaries fell as low as £19 17s. 6d. to £20, while £20 5s. to £20 7s. 6d. were quoted for specials.

In December, however, there was at last a turn for the better, both here and in America, where the supplies available for export were considerably reduced. Large purchases were made on the Continent at advancing prices and American sellers withdrew from the market. The London market lagged somewhat behind the others, but the tendency was distinctly firmer at £20 5s. to £20 7s. 6d. for good ordinaries and £20 10s. to £20 12s. 6d. for specials.

COAL IN 1899.

As this has been a year of great industrial activity all over the world, the consumption of fuel has been enormous, and the year's output of coal, easily the largest on record, shows a handsome gain over last year's great total. This improvement has come from all coal-producing countries, though most pronounced in those already prominent where the amount of ground opened permits a quick, large increase by the mines in response to any sudden demand. It is to be remembered, however, that manufacturing of all kinds became active in Europe, after the financial distress of the early 90's, sooner than in the United States. Consequently, the increase on the Continent in 1899 as compared with 1898, is not so marked as in this country. It is also to be remembered that the policy of many of the German coal producers is to restrict production even in the face of an advancing demand and higher prices, though such a policy evidently tends to hamper the country's industrial growth. As regards England, our

last year being 32,439,786 metric tons, while this year shows an increase of about 2,000,000 tons. We have already noted the restrictive policy pursued by many German coal mine operators; notwithstanding the great activity of all lines of industry in the empire during 1899, it need not excite surprise that the output of coal does not show a heavier increase, being approximately 137,600,000 metric tons in 1899 against 127,938,490 metric tons in 1898.

Spain has had a period of internal quiet, and freed from the burdens of war has shown a decided increase in the value and extent of its manufactures. The importations of coal into that country show a decided increase, as should the amount produced.

The Russian mines, particularly those of the Donetz basin and of Western Siberia, are believed to have increased their output. However, the country is passing through an industrial crisis, and it is quite possible that the total output will not exceed the 1898 production of 10,260,000 metric tons.

In England attempts to extend the visible limits of coal supply go on. The most notable development in 1898 were the explorations for the coal measures in southeast Kent, in the hope that coal-bearing strata might be found running across the southeastern part of the island, and ultimately connecting with the French coal fields. Drilling has gone on during the year, and some thin seams of coal have actually been found at a great depth. The results as yet do not warrant any development by sinking shafts, much less do they justify any formation of mining companies, but nevertheless they serve to show that there is probably an area of workable coal which will ultimately be developed. The large part of the increase in English coal production comes, as was to be expected, from the Welsh collieries, which would have made an even better showing but for the interruption of shipments on account of many colliers being withdrawn by the Government to supply the fleet. The North of England and Scotch districts have shared in the prosperity of the iron industry, and show substantial gain. England in 1898 still kept her proud position as the greatest coal mining country in the world, but as we noted in our last annual review, the United States was increasing its output at such a rate that England's supremacy could last but a few years more, and might end within a year. The change has come more swiftly and strikingly than we imagined, and the United States has finally passed her only great competitor. England's total production in 1898 was 202,042,243 long tons, and in 1899 about 209,000,000 tons.

In Asia there has not been much done in opening up new sources of fuel supply during the year. Russia has been busy, but the work undertaken has reference more to the future than the immediate present. It is not probable that the output of the mines on the line of the Siberian Railroad between Vladivostok and Khabarovska has been materially increased. The Russians have transferred their energy to northeast China, and on account of the vast amount of work under way on the Eastern Siberian Railroad and at Port Arthur the Shan Tung mines have seen some active development, and have probably made an increased output, but no figures are yet available to show the amount. In China itself little has been done. The inertness of the great mass of population and the corruption of the officials bid fair to remain a bar to the introduction of modern methods for some time yet, and little improvement in mining or in the total amount of coal produced can be expected until foreign capital and foreign mining engineers are given proper protection, either by the Imperial Government or by some European Power.

In India, the British Government has continued to foster the development of the country's natural resources, and the output of the Deccan mines will doubtless show an increase in spite of the check to industrial growth from plague and famine.

The Japanese mines have been busy, and the output for the year should show a substantial gain. Improved methods of mining and improved machinery are being introduced in all the Japanese collieries, and the percentage of coal extracted in proportion to that left is steadily gaining. The Australian collieries have shared in the world's activity, and all show substantial gains in the production of coal as compared with 1898.

Little is known about the coal-fields in the Philippines, about which so much was heard during the war with Spain. Insurrection in the islands kept down any attempt at prospecting the mineral resources, but such information as has come to hand indicates that the coal is of inferior quality and not likely to play any great part in the future development of the East.

In Africa all mining activity is suspended on account of the struggle for supremacy between the Boer Republics and the British Empire. During the early part of the year, however, before the feeling between the resident population and the Uitlanders became acute, the Rand gold mines were rapidly increasing their output, various railroad schemes were projected, and the general industrial condition of South Africa was excellent. It is fair to presume, therefore, that but for the outbreak of hostilities the coal mines of the Transvaal, Natal and the Orange Free State would have shown a handsome increase over last year's figures. What little coal is now mined is for the use of the railroads, and many of the best mines are closed entirely.

Coming to the Western Hemisphere, there is little to note of progress in South America. Good deposits of coal are known to exist in Peru, and also in Colombia, but the entire lack of mechanical aptitude among the inhabitants, a low public spirit and a lack of co-operative responsibility make the prospect for industrial growth through native inception very slight. In the Argentine Republic and Chile there has been considerable progress in mining during the year, and the output of coal will doubtless show a gain. The production still falls short of domestic consumption, and large amounts have to be imported—most of it from Australia, but this year large shipments have gone from the United States. Some deposits of coal and lignite in Patagonia and Terra del Fuego, when systematically developed, will doubtless furnish annually a considerable output for the shipping trade.

In North America, outside of the United States, one of the chief events of the year has been the opening of the collieries at Fernie,

TOTAL PRODUCTION OF COAL IN THE UNITED STATES.
(In tons of 2,000 lb. Figures subject to revision.)

States	1898.			1899.		
	Tons.	Value.		Tons.	Value.	
		Total.	Per Ton.		Total.	Per Ton.
Bituminous:						
Alabama	6,466,741	\$5,496,790	\$0.85	7,559,281	\$7,181,317	\$0.95
Arkansas	21,134,064	1,202,108	1.06	29,173,743	1,233,553	1.35
California	135,795	334,999	2.47	154,936	438,851	2.83
Colorado	4,125,206	7,219,110	1.75	4,768,581	8,344,929	1.75
Georgia	240,000	156,455	0.65	203,775	183,081	0.90
Illinois	218,599,299	14,567,598	0.78	23,434,445	18,443,946	0.79
Indiana	5,435,896	4,739,230	0.87	6,305,639	5,675,075	0.90
Indian Territory	21,458,098	1,822,622	1.25	21,404,442	2,106,663	1.50
Iowa	4,117,359	4,759,967	1.16	5,400,000	6,210,000	1.15
Kansas	3,890,405	4,193,160	1.09	3,059,000	4,117,500	1.35
Kentucky	3,492,243	2,479,493	0.71	4,160,000	3,035,136	0.73
Maryland	4,621,618	3,142,700	0.68	5,181,618	4,404,375	0.85
Michigan	178,035	263,492	1.48	250,000	375,000	1.50
Missouri	2,858,132	3,148,832	1.10	3,191,811	3,582,111	1.12
Montana	1,450,471	1,902,252	1.31	1,400,000	2,072,000	1.48
Nebraska	500	1,750	3.50			
New Mexico	2863,583	1,416,890	1.64	21,049,034	1,600,588	1.53
North Carolina	6,144	8,602	1.40	27,094	40,641	1.50
North Dakota	124,526	124,526	1.00	119,441	119,441	1.00
Ohio	14,053,829	10,680,910	0.76	14,967,328	11,973,862	0.80
Oregon	65,871	183,542	2.79	78,400	245,000	3.12
Pennsylvania	64,247,859	38,548,715	0.60	73,563,739	50,023,383	0.68
Tennessee	3,084,748	2,340,346	0.76	3,454,918	2,763,934	0.80
Texas	726,133	1,103,722	1.52	935,840	1,506,702	1.61
Utah	571,417	583,084	1.02	882,496	1,588,493	1.80
Virginia	1,640,000	984,000	0.60	1,387,179	887,735	0.64
Washington	1,988,288	3,301,978	1.66	1,400,000	2,812,500	2.01
West Virginia	16,499,840	9,715,754	0.59	19,000,000	11,210,000	0.59
Wyoming	3,181,905	4,006,756	1.26	3,600,000	4,500,000	1.25
Total bituminous	{ Sh. tons. . . 165,208,025 Met. tons. . . 149,875,737	\$128,419,354	\$0.78	187,843,750	\$156,675,876	\$0.83
Cannel:						
Kentucky	{ Sh. tons. . . 49,889 Met. tons. . . 45,259	\$194,700	\$2.70	40,000	\$100,000	\$2.50
Anthracite:						
Colorado	48,831	\$134,285	\$2.75	38,348	\$105,457	\$2.75
Pennsylvania	52,799,774	81,311,652	1.54	56,659,177	90,088,091	1.59
Total anthracite..	{ Sh. tons. . . 52,848,605 Met. tons. . . 47,943,940	\$81,445,937	\$1.54	56,697,525	\$90,193,548	\$1.59
Grand total coal	{ Sh. tons. . . 218,106,519 Met. tons. . . 197,864,936	\$209,999,991	\$0.96	244,541,275	\$246,969,424	\$1.01

(a) Fiscal year.

great competitor in coal production, while accurate figures are not obtainable it is plain that the increase in coal mined has been marked. The English collieries have been steadily busy, and their production has been stimulated by the high prices of pig iron and all forms of finished iron and steel. During a large part of 1898 the Welsh mines were idle, owing to a bitter struggle between the miners and the mine owners regarding the rate of wages. This year there have been no strikes of importance in the coal fields, which fact alone will account for part of the increase shown.

There has not been much progress in opening new coal fields in Europe. Finds of good coal have been reported, but the increase in production has come from the old and well-known districts.

The French output shows its usual small per cent. of gain, the figures

B. C., by the completion of the Crow's Nest Pass branch of the Canadian Pacific Railway. The coal produced at Fernie is reported to be of excellent quality, and has found a ready, if somewhat restricted, market. In connection with the collieries 150 coke ovens are completed, and their product is in great demand, not only in British Columbia but also in the neighboring States of Montana, Idaho and Washington, to supply numerous smelters. The total output of the Crow's Nest Pass Coal Company's mines increased greatly during the last few months in the year, and is now stated to be about 16,000 tons monthly. The number of coke ovens is being increased, and the production will show a decided increase in 1900. On the west coast of British Columbia and on Vancouver Island the coal mines have had a prosperous year. The shipping trade consequent on the opening of the Yukon gold fields, though less than in 1897 and in the early part of 1898, has been considerable. Increased activity in mining and manufacturing in California has led to larger shipments of British Columbia coal to San Francisco. On the Atlantic seaboard the Dominion Coal Company's properties at Cape Breton have had a very prosperous year. The formation of the Dominion Iron and Steel Company and the erection of great blast furnaces at Sydney insure a much heavier output in the near future. Other Nova Scotia mining companies have increased their output, partly owing to a better demand in Canada, but chiefly on account of the very high ocean freight rates and the shortage of soft coal along the Atlantic seaboard of the United States in the last half of the year, which led to considerable importations of Canadian coal at points east of Cape Cod. The total output of Nova Scotia mines for the year is 2,642,333 tons, compared with 2,281,454 tons in 1899.

In Mexico there have been very few developments. The Southern Pacific Railroad, which now relies largely on Utah and California coal, brought many hundreds of miles, has been searching for coal in Sonora, where a limited field of coal not of extra quality and lying in thin beds has been known to exist for some time. The explorations, however, are reported fairly satisfactory, and the railroad is preparing to do considerable development. There have been finds of coal reported from other States in the Republic, but the amount of new production is limited, and this year's total output will probably not exceed 400,000 tons, as compared with 367,193 metric tons in 1898.

The United States this year steps to the front as the greatest producer of coal among the nations of the earth. The increase in output over last year has been very great, and at first sight almost past belief. This increase, however, is but the logical outcome of enforced economies imposed upon mine operators and railroad systems during the years of painful recovery from the financial disasters of 1893. As all credit had been badly impaired and all speculative ventures discouraged, the manufacturing and coal mining interests of the country found themselves with a productive capacity built up during a period of great prosperity facing a contracted demand due to the impaired purchasing power of the great mass of the population. Consequently only those concerns which were best equipped or best situated could hope to keep going. Over-capitalized railroads and poorly situated or expensively operated mines were forced to the wall, and a transition period prevailed in which the best situated mines extended their advantages. Labor-saving machinery, with engines and boilers of latest pattern, became more necessary, and on the railroads heavier track, stronger rolling stock and increased facilities for handling coal were likewise needed. All this stress and forced economy brought out the advantages that certain coal fields have for supplying certain markets, and now that all lines of industry are busy as never before it is not strange that the advantages acquired under adversity should be strikingly manifested in the first year of general prosperity.

The production of coal has been but little hindered by long drawn contests between miners and operators, notwithstanding the advancing market for labor. There have been local difficulties of some moment, one, for instance, in the anthracite district of Pennsylvania, and a few short-lived ones in the bituminous region of the same State. There was also a short-lived strike in the New River field of West Virginia, and some minor troubles in Ohio, Indiana and Illinois. In the last State the extraordinary action of the Governor regarding the outbreak at Virden in the summer of 1898 served to prolong ill-feeling between miners and operators in the Macoupin County fields, and there was more or less friction during the first half of the present year. In Alabama, where the miners are paid on a sliding scale based on the price of pig iron, the great rise in the price of pig gave the coal miners a higher rate of wages than they had ever enjoyed before, and naturally labor troubles were few. There were strikes in Tennessee, but in general, as stated above, the great Eastern coal fields were free from serious disturbances. Much of this freedom is due to the so-called Chicago agreement between the operators and miners of Ohio, Indiana, Illinois and Western Pennsylvania, by which certain rates of wages were established early in the year to hold until a corresponding date in 1900. Further west the union element which has done so much to discourage investments of capital by acts of violence, came to the front at collieries in Montana and Wyoming, causing shutdowns. In Colorado the miners of the northern coal-fields had their usual grievance against the operators, who are forced to compete with the output of the mines of the southern coal-field for the Denver market, but there were no prolonged strikes.

The only really serious strike of the year was in what is known as the Southwest coal-field. This comprises mines in Arkansas, Indian Territory and Southeastern Kansas. The strike apparently was one of those outbursts which, having a reasonable foundation, are fomented by irresponsible demagogues posing as champions of the down-trodden laboring man. It had as a basis a demand for an increase in the mining rate, and this demand appears to have been justified. The strike, however, speedily assumed a more serious phase, the leaders of the Union demanding that the operators should employ only such men as the Union wished, and should not try to bring in miners from West Virginia or other outside fields. The State officials in many cases apparently sympathized with the strikers, and while there were few conflicts resulting in bloodshed, the State courts undertook to nullify decrees of the United States courts. At least one leader of the

Miners' Union was sentenced to several months in jail for contempt of court by a United States judge. The contest has seriously interfered with production in this field and is not yet finally settled.

Coal mining has not escaped the tendency toward consolidation of interests and concentration of effort which has been so marked a feature of industrial activity during the year. In the Pennsylvania anthracite trade the so-called independent operators have had their influence greatly curtailed by the efforts of individuals connected with the Delaware & Hudson and Delaware, Lackawanna & Western railroads and are no longer in a position to cause any serious disturbances in the market. The Lehigh Valley came under the control of Morgan interests. Over 60 per cent. of the anthracite output is now under Morgan control, while the other roads are under interests acting in harmony. The chief changes have been in West Virginia, in Ohio and in the Pittsburg District. In West Virginia the principal collieries of the New River field have passed under the direct control of the Chesapeake & Ohio Railroad by the formation of the New River Coal Company. In Ohio the Hocking Valley and the Wheeling & Lake Erie roads have been reorganized, while the Pennsylvania has secured control of the Cleveland, Akron & Columbus.

By far the most important consolidations of the year, however, were in the Pittsburg District. This region contains many small mines working on different seams of coal, and the number of the companies has led to much fierce competition, and consequent loss of profits, while the great difference is in the character of the mines, and the costs of mining in different localities, or on seams of different thickness, has caused perennial disputes between miners and operators. Hence, the field was one where consolidations could accomplish much good. The changes are described at length by our Pittsburg correspondent.

Purchasers of coal lands were unusually active during the year. The great steel and iron companies have striven to strengthen their respective positions by acquiring reserves of fuel supplies, and have bought up many thousands of acres of coal lands. To note only the more important transfers would require more space than we can give, but it is safe to say that there has not been such a movement in coal properties in many years.

Pennsylvania remains the first State in coal production, and during the year has emphasized its pre-eminence. There was a six months' strike among the employees of the Susquehanna Coal Company; some short-lived disputes in the Pittsburg District, and some larger ones in the Northwestern fields of the State, but the only large strike was in the Clearfield region. Here in July many thousand men were out, but only for a few weeks. All the mine operators have had an extremely busy season, and except for the usual let-up in the anthracite region during spring and early summer, the mines have had a steadily increasing demand for their product. The result is shown by the year's total of 73,563,799 short tons, against 64,947,850 tons in 1898. Illinois holds second place. The Missouri mines have taken away some of the State's St. Louis trade, and increased activity in the Ohio fields has cut into the Chicago business. As noted before, there were some serious labor disturbances in the State, but these were generally compromised by July, and production during the last half of the year was very heavy. The fiscal year's total was 23,434,445 tons, as compared with 18,599,299 short tons in the fiscal year 1898.

Indiana mines also shared the great prosperity of the Middle West, and though there were local disturbances between miners and operators, here, as in Illinois, the interstate agreement governing wages was generally adhered to, and work has not been seriously interrupted. The State's output was 6,305,639 short tons, compared with 5,435,896 short tons in 1898.

Ohio has also benefited somewhat by the year's prosperity. During a large part of 1898 the mines in the Hocking Valley region were closed, and many miners were in abject poverty. The improvement which came in the last months of the year continued through 1899, and the year's output has been heavy. There has been no serious disturbances to production except the short supply of railroad cars, which all mining States have felt, and the total output is 14,967,328 tons, compared with 14,053,829 short tons last year.

West Virginia has shown the most striking developments of the year. The old mines kept up their record, and those which supplied the Atlantic seaboard trade found themselves in the last half of the year confronted by a demand they could not begin to supply. Many of the small operators of the Pittsburg District, after the consolidation of interests there, took their cash and experience into West Virginia, and are preparing to open new mines. Next year's output will undoubtedly show a marked increase over this year's, and the State should easily surpass Illinois. The total production this year was 19,000,000 tons, compared with 16,499,840 short tons in 1898.

Michigan shows a decided increase in output from its mines, which are principally those about Bay City and Saginaw. The year's output is about 250,000 short tons, a good gain over last year's figures, 178,035 short tons.

Kentucky and Tennessee mines have been busy, though in the latter State labor troubles have interfered to some extent with the production.

Alabama, owing to the very prosperous state of the Southern iron industry, has had an exceptionally good year, and its output of 7,559,281 tons shows a gain of 1,092,540 tons over last year. The course of the industry during the year is described by our special correspondent.

Of the States west of the Mississippi, Missouri shows a handsome gain. Manufacturing has been active, and labor troubles in the Kansas fields have helped the Missouri operators. The year's production was 3,191,811 tons, compared with 2,838,152 short tons in the last fiscal year.

Iowa, like Illinois and Missouri, has benefited by the great activity of all manufacturing industries in the Middle West, and shows the heaviest gain for the year, its output being 5,400,000 tons, as compared with 4,117,359 short tons last year.

Of the States further west, Montana and Colorado have both had labor troubles, which have restricted production, though Colorado shows a gain. Wyoming has had a favorable year, and shows a good increase.

On the Pacific slope the Corral Hollow mines, at Tesla, California, the only mines of importance in the State, have been worked to their full capacity.

Washington mines have had a fair year, but the output of coal shows a heavy decrease, being about 1,400,000 short tons, compared with 1,988,288 short tons in 1898.

While everything favors an excellent demand for coal during the coming year, it is evident also that the fuel will command generally higher prices. All the coal carrying roads are talking of higher freight rates, and in some cases these rates have already been made. The various consolidations already formed will undoubtedly try to keep business on a profitable basis. It is clear also that the miners are

tired when Mr. Truesdale took control after Mr. Samuel Sloan's resignation. The result has been a decided gain in mutual good feeling among the anthracite roads. Vanderbilt interests are reported to have secured a stronger hold on the Delaware & Hudson, and, it is stated, helped form the Temple Iron Company, which took over the interest of Simpkins & Watson, of Scranton, thereby crippling the influence of the independent operators. Vanderbilt and Morgan interests have been apparently in sympathy through the year, and the Pennsylvania Road has apparently been on good terms with the Vanderbilt roads also. As a result, not only has the year's output been the heaviest in the history of the trade, but prices actually realized have been higher than since 1893.

The year opened well. December storms had stimulated buying, and consumption was heavier than at any time in 1898. Coal at New York sold freely, but the price had not yet got up to the nominal quotations made by the companies in November. Thus, broken was quoted at \$3.20, egg at \$3.40, stove at \$3.55 and chestnut at \$3.50. The only trouble during January was at Boston, where the Metropolitan Coal Company disturbed retail conditions by naming low prices in order to secure more of the business. There was a lot of talk on combinations and consolidations during the month, most of it on rather a slight basis, although it was evident that the New York, Ontario & Western would be taken care of in much the same way as the New York, Susquehanna & Western had been, and would cease to be a disturbing factor in the trade. The output for the month was 3,761,855 tons, although the estimated output had been but 3,250,000 tons.

February brought cold waves which started buying again, and by the end of the month sales agents were confident of a good year. It was seen that stocks at the head of the lakes and in Chicago territory would be all cleaned up before navigation would open, necessitating a very heavy movement from the collieries. Nut coal was by this time in very short supply in the West, and its price at Chicago advanced 50 cents in about two weeks. This shortage of nut coal was apparently due to its increased use in base-burning stoves. As it is practically impossible for the breakers at the collieries to alter their screens so as to change the relative per cents. made of the various sizes, any increased demand for a particular size is pretty sure to make that size scarce and command a premium. This shortage of nut size finally was felt in the East. By the end of the month stove coal was quoted at \$3.75 and nut at \$3.65. The month's output was 2,810,351 tons.

By the opening of March it was pretty plain that the proposed new railroad to be built by the independent operators, the New York, Wyoming & Western, had received its quietus. It probably had never been very seriously projected, and when some of the leaders of the independent movement went over to the enemy, the smaller concerns felt they could accomplish little. During the month the Temple Iron Company was formed and some extensive purchases of coal lands were made by the New York, Ontario & Western. The demand for coal in the East was fair, and in the West very good, a considerable amount of coal going forward to Chicago by rail. The collieries by the end of the month were running two-thirds to the three quarters time, and were selling all the coal mined. The small steam sizes, which had been in excellent demand through the winter, were now quoted \$2.40 and \$2.60 for pea, \$2.10 and \$2.40 for buckwheat, and \$1.40 and \$1.65 for rice. The estimated output for the month was 2,000,000 tons.

April brought warmer weather, and a consequent fall in demand, particularly in the East. Stocks were allowed to accumulate preparatory to a heavy movement up the lakes when navigation opened. The sales agents of the various companies met and announced a new schedule of prices from May 1st, as follows: Broken \$3.15, egg \$3.35, stove \$3.75, nut \$3.75. It was openly stated that the selling price of nut coal in February at New York had been about \$3.45, and in March \$3.54.

The independent operators toned down their demands, and their contracts with the coal-carrying roads were generally renewed on the old basis of 60 per cent. of the selling price at tide-water. The total output for the first third of the year was 13,067,016 tons, 2,237,000 tons ahead of the 1898 figures.

May brought the opening of lake navigation, two weeks later than usual. All docks were practically cleaned up, there being less than 1,200 tons on hand at the head of the lakes, and perhaps less in proportion at Chicago. The movement west started strong, the current price of transportation from Buffalo to Duluth being 30c. per ton. In the East consumption fell off, and reports of cuts were heard before the end of the month, particularly at Boston, where low figures were made and retail buying became active. The May output was 3,557,489 tons.

The situation in the East showed little change during June and July. A new New York price list was brought out July 1st, as follows: Broken \$3.50, egg \$3.75, stove and nut \$4. This schedule, however, was not by any means adhered to. Sales agents gave out that there would be no concessions made, but it soon transpired that contracts taken at prices made in May would be filled. Consequently, the July price list did not accomplish much, except to stir up a little temporary buying.

The movement up the lakes, which had started so well, was interrupted by a strike among the dock laborers at Buffalo, which greatly interfered with all shipments over two weeks. Freight rates up the lakes continued to get stronger, and by the middle of June 40 cents to Duluth was freely paid. The movement west continued heavy during June, the month's total output being 4,024,270 tons, and for the first half year 20,648,775 tons, compared with 16,191,420 in the corresponding period of 1898. By this time it was plain to everybody that with a little care in handling things the year's business would surpass the expectations of the most sanguine. The market was shaky in the East, but demand West kept up well, largely owing to the refusal of the companies to sell more than a month ahead at current figures.

Selling prices for the six months f. o. b. New York were approximately: Broken, \$3.13; egg, \$3.27; stove, \$3.59; nut \$3.53.

The July prices were not maintained in the East as they might have been, and it was openly charged in August that at least two companies, which had "renewed" contracts at the May figures were taking new orders on the same terms. The collieries were running on short time, working on an average perhaps four days a week. The demand from the West continued good, though lake freights from

TOTAL PRODUCTION OF COKE IN THE UNITED STATES.
(In tons of 2,000 lbs. Figures subject to revision.)

States.	1898.			1899.		
	Tons.	Value.		Tons.	Value.	
		Total.	Per Ton.		Total.	Per Ton.
Alabama.....	1,541,250	\$2,620,125	\$1.70	1,894,550	\$3,889,246	\$2.12
Colorado.....	445,925	1,226,294	2.75	455,783	1,253,403	2.75
Georgia.....	50,000	63,500	1.27	44,529	92,748	2.08
Illinois.....	3,000	4,950	1.65	3,000	6,600	2.20
Indiana.....	1,521	2,662	1.75	2,000	4,500	2.25
Indian Territory.....	(a) 34,810	78,323	2.25	(a) 29,362	95,426	3.25
Kansas.....	10,000	20,000	2.00	75,000	187,500	2.50
Kentucky.....	21,394	30,593	1.43	45,000	66,496	1.48
Montana.....	70,235	529,825	7.54	56,500	431,095	7.63
New Mexico.....	(a) 2,275	5,119	2.25	(a) 33,661	76,410	2.27
Ohio.....	100,000	250,000	2.50	110,000	275,000	2.50
Pennsylvania.....	10,671,920	21,663,998	2.03	13,339,900	23,344,825	1.75
Tennessee.....	394,545	710,181	1.80	441,890	883,780	2.00
Utah.....	28,327	127,809	4.51	26,700	122,820	4.60
Virginia.....	525,000	703,500	1.34	550,008	775,511	1.41
Washington.....	62,720	219,520	3.50	56,000	200,000	3.57
West Virginia.....	1,916,482	2,184,789	1.14	2,225,000	2,670,000	1.20
Wyoming.....	18,393	64,375	3.50	16,000	56,000	3.50
Total coke	15,897,797	\$30,505,563	\$1.92	19,344,883	\$34,431,360	\$1.78
Sh't tons.	14,422,387		2.12	17,549,562		1.96

(a) Fiscal year.

going to get better wages. The interstate conference between representatives of miners and mine operators will be held at Indianapolis opening January 15th. The present basis for mining is 66c. for runs of mine coal, and it is altogether likely that this rate will be increased to 75 cents. In the Georges Creek region of Maryland the operators are likely to grant an increase of 10 cents a ton in the mining rate. The West Virginia miners have formulated a demand for an advance of 15 cents a ton after April 1st, when their present agreement expires. This agreement chiefly applies to the Kanawha field, the New River miners having secured an advance of 5 cents during the summer, while conditions in the Pocahontas field are still a barrier to the organization of labor unions there. The Clearfield miners, in Pennsylvania, will also secure a substantial advance on April 1st.

While coal must therefore be higher, consumers will pay the advance without demur. The demand should be enough to keep producers busy for the year, but it is not to be supposed that this condition of things will last. West Virginia alone is making enormous strides in opening up coal reserves, and the present high prices will stimulate mining in less favored fields. The railroads are improving their rights of way and adding better rolling stock, thus increasing average trainloads, and consequently reducing ton-mile costs. It is altogether likely, therefore, that in a few years the total amount of coal offered will exceed the amount wanted at current prices, and the prices will fall even below the low figures prevailing last year. While this may not be altogether a blessing for the coal miner and operator, yet it will give American iron and steel manufacturers a sure grip on the markets of the world for the opening years of the coming century.

Pennsylvania Anthracite Trade in 1899.

It is scarcely possible to imagine greater contrasts than those shown by the anthracite trade during the years 1898 and 1899. Hard coal being somewhat of a luxury in many States, as compared with bituminous, is first to feel the effect of bad times, and last to show any gain in consumption when times grow better. Moreover, the anthracite mines have now so much ground opened up that the total productive capacity is likely to be in excess of the total consumptive demand at prevailing prices most of the time. Consequently, there is always a temptation among the big mining and transportation companies that control the trade, to get the best of each other by marketing more than the amount of coal allowed by common consent to each interest. The result of this situation is so familiar to readers of the "Engineering and Mining Journal" that there is no need of going into it in detail. It is sufficient to say that in 1898 the anthracite trade still felt depressed, and collieries of one large company worked but about five days a month during early summer. The miners were miserably paid; the selling price for coal was far below the nominal quotations, and but for an unexpected heavy demand in the West, as a result of several years' good crops, and later a very heavy buying in the East on account of the early coming of cold weather, the year would have been one of the worst on record.

In 1899, however, conditions have been altogether different. People realize that good times have come. There is a general feeling of optimism throughout the country, and a consequent willingness to indulge in luxuries. Again, the mining and transportation companies have finally concluded that harmony is the best policy and have worked together.

Morgan interests became more a factor in the trade during the year, the firm of Drexel, Morgan & Company taking up its option on the Lehigh Valley stock of the Packer Estate. The Delaware, Lackawanna & Western system received a much needed overhauling. Various officials that were thought to have outlived their usefulness were

Buffalo to Duluth rose to 45 and then to 60 cents, and as a result the July output was 4,168,000 tons, and the August output 4,258,000 tons.

In September things changed for the better. The companies decided that there was no use in granting concessions, and sales agents became very firm in quoting prices. The movement West was hindered by high freights up the lakes, 75 cents being asked from Buffalo to Duluth, but buying East proved very much better than any one expected, and the stocks on hand showed an actual decrease during August, much to the surprise of the trade. A new price list showing a 25-cent advance was brought out October 1st. This was a notification to all purchasers that the time to buy coal was at once. The movement from docks in the West became extremely heavy, consumers realizing that winter was getting near and a rising freight market must bring still higher prices, there being no possibility of any cuts.

The September production was 4,365,650 tons, making a total for the first three-quarters of the year of 33,440,425 tons, as compared with 28,003,830 tons in 1898.

During the last three months of the year everything came the coal producer's way. Consumers at both Eastern and Western points cheerfully paid higher prices, and without an effort the mining companies found themselves getting what may be called list figures. For a while it looked almost as though there might be an actual coal famine, so heavy was the demand, and so high were freight rates to both lake ports and to points along the Atlantic coast reached by vessels. An unusually mild and open November, however, allowed shipments up the lakes much later than usual, and freedom from storms along the Atlantic seaboard allowed a great tonnage to go forward. As a result, by the end of December the market in the East was beginning to show slight weakness, but a cold wave at the end of the month stirred up retail buying on a large scale, and the year ends with even a more prosperous outlook than at its beginning. The production in October was 4,894,597 tons, in November 4,689,000 tons, and for December it is estimated at 4,275,000 tons, making for the year a grand total of 47,297,022 tons.

Prices have been firmly maintained at New York at the October figures, and in some cases a slight advance has been obtained for pressing deliveries. Nut coal is increasingly scarce, and at the end of the year commands a slight premium over anthracite in the West, and is firmly held at Eastern points. Owing to the great demand for coal by manufacturing concerns in the East, the sizes of anthracite generally used for steam production have been in much better demand than usual. This has kept broken size from being a drug on the market, and has made pea and buckwheat bring excellent prices.

Average selling prices f. o. b. New York were, for the last half of the year: Broken, \$3.22; egg, \$3.49; stove, \$3.92; nut, \$3.93.

An incident of the closing months of the year was the announcement that men connected with the Pennsylvania Coal Company, which owns collieries and has a railroad running from Pittston to Dunmore, had purchased the abandoned canal of the Delaware & Hudson Company and would build a road from Kingston to Carbondale and Lackawaxen, thus furnishing a new rail outlet for the Wyoming Valley. This announcement was seized by representatives of the independent operators as a foundation for press notices of what the new road would accomplish in the way of cheapening prices to consumers and also insuring lower freight charges to producers. While it is quite possible that the road will be built, the influence of the independent operators' association may not amount to much in its control.

Production during the year was much more uniformly distributed than of late years. There have been few serious strikes; the most important was at the collieries of the Susquehanna Coal Company at Glen Lyon and Nanticoke. This started in May, the original grievance being over wages, and that related subject which is a perennial source of dispute in the anthracite region—the "topping" of coal cars, the company requiring all cars to be well rounded up when delivered at the head of the breaker. The strike drifted into a contest between the company and representatives of the American Federation of Miners, who were trying to extend the influence of the union in the anthracite region. The leaders made various demands, which the company steadily refused, and finally the strike was compromised, the miners getting a slight increase in wages. There were strikes also at other points in the region, but none were of long duration. The collieries in the northern fields were troubled to some extent by a short supply of water during the late summer and some were obliged to close down for several weeks, but the drought was not serious enough to affect production generally.

The outlook for the coming year is excellent. Owing to the general demand for labor, large numbers of miners have gone from the anthracite region to the bituminous fields and to the Lake Superior iron mines. As a result there is now no over supply of men, and the anthracite miners are sure of steadier employment for a year or so at least. A winter of ordinary severity will insure steady production and good prices. The certainty of a continuation of industrial activity will enable the companies to face any falling off in demand as spring approaches with a confidence born of the knowledge that people are able and willing to pay the price for such a luxury as a bright hard coal fire.

The Atlantic Seaboard Bituminous Trade in 1899.

The year just past has been noteworthy in two respects. In the first place, all the manufacturing interests supplied by the seaboard soft coal trade had a year of great prosperity and needed all the power they could command. In the second place, a prolonged drought, which began in April and was hardly broken when winter set in, greatly curtailed the water power of many mills and was felt especially by those concerns which, in an ordinary season, would rely almost wholly on water power. These mills found themselves confronted with a great demand for their products and a very short supply of their ordinary source of power. Consequently they were forced to buy coal more actively than ever before in their history. The result to the trade at large was a demand for coal that surpassed the expectations or dreams of the most experienced men in the trade, and caused an activity at

the collieries which was limited only by the general scarcity of cars. The output was very heavy and was probably at least 25 per cent. better than in 1898.

Prices, however, were not as good as might have been expected. The steady tendency downward through previous years and the short-sighted policy of several railroads in excessive competition for business by lowering freight rates from mines to tide water, had resulted in bringing bituminous coal prices, at the opening of the year, to about the lowest figure in the history of the trade. In fact it was openly stated that one prominent concern took orders at \$1.45 per ton for future delivery f. o. b. a Chesapeake Bay port, while other concerns are known to have made almost as low prices on government contracts.

The general condition of the trade during January was fair. There was a heavy demand for vessels for transportation to points beyond the Cape, and vessel freight rates were extremely high. The Atlantic Transportation Company, which had brought around a number of vessels from the Great Lakes to use in carrying coal, found these craft unsuited to its needs, was unable to fulfill its contracts, and went into the hands of a receiver. Coal of the better sort was quoted at \$1.65 and \$1.70 Chesapeake Bay ports, but contract prices are known to have been considerably less. Freight rates were unusually high owing to the storm of the previous November, which had seriously crippled the carrying fleet, and during the month rates from Philadelphia to Boston were \$1.50 and \$1.75, and to the Sound ports \$1 and \$1.35. Contracts for the coming season were taken at prices which were, if anything, a little less than those named the previous year. Many producers realized that ocean freight rates were going to be higher, the general feeling being that the advance would be fully 25 cents as compared with 1898, and fought shy of delivered contracts. Still, many such contracts were taken, and there were the usual number of contracts "for season's supply," specifying no definite limit to the tonnage to be delivered.

A feature of the winter's business was the attention given to export trade. This started as a result of the prolonged strike in the Welsh collieries in 1898, giving American producers a chance to ship to ports where, hitherto, English and Australian coals had been the chief reliance. As a result, there were an unusually large number of contracts for coal, to be delivered at Central and South American ports, taken during the winter, some of these at very low figures.

February opened cold and stormy. Shipments by rail and water were greatly impeded, and consumers who had been stimulated by an early winter fell off in their demands so that coal was in less demand during the month than at any time since December 1st. What proved to be the greatest check on the output of the mines during the year, that is, the supply of cars at the collieries, already was heavily felt, the supply not averaging over 75 per cent. of the total wanted by operators. By March, however, producers began to get some idea of what the future had in store for them. The demand for coal for immediate needs became heavier and producers in some cases were forced to help each other out. It was by this time plain that the Baltimore & Ohio and the Pennsylvania roads were not in agreement regarding freight charges, and the Norfolk & Western was reported to be taking contracts at extremely low figures. Prices quoted, however, were on a basis of \$1.65 for best grades at Philadelphia and Chesapeake Bay ports. Some delivered contracts continued to be taken, although freight rates were \$1.15@\$.1.25 from Philadelphia to the Sound ports during the month, and \$1.30@\$.1.45 to Boston. More coal than usual went forward by rail, some of it going as far as Haverhill.

April opened with all outside business pretty well covered by contracts. The outlook for the year was extremely good and producers were preparing to get out coal as fast as they could. Heavy shipments from New York Harbor ports, consequent on the high vessel rates from Philadelphia and Chesapeake Bay, led to a break in ocean freight rates which brought down the rate from Philadelphia to Providence to 65c., and to Boston 75c. Export business was by this time limited to contract orders, and it was given little attention for the rest of the year. Trade during May was generally quiet, with no change of movement in the price of coal or in the ocean freight charges. There was some attempt to stir up trouble among the miners in the West Virginia field, which amounted to little, the mining companies stating that their business being already covered by contracts at low figures they were not in a position to grant advances in wages. A strike in the Clearfield District, in June, checked production there, and the demand for coal became more marked. Some firms saw that they would have their hands full to supply their regular customers and declined all outside orders, though at the same time it was reported that certain firms had taken Government contracts at extremely low figures.

The Clearfield strike broke early in July. A smaller strike in the Georges Creek field had already broken. The collieries found an excellent demand for all the coal they could get forward, with consumers willing to pay 10c. a ton or so extra for prompt delivery. Car supply, however, continued insufficient, being but two-thirds to three-quarters of the demand, while vessel freight rates remained high for summer months, being 70c. from Philadelphia to Providence, and 80@90c. from Philadelphia to Boston.

The demand for coal for immediate needs became constantly heavier as manufacturers now felt the drought, and had to buy coal at once to keep going. This demand was especially heavy from points beyond the Cape. Late in July came an announcement of harmonious relations between the New York Central and Pennsylvania regarding rail shipments.

By the middle of August the producers found themselves utterly unable to supply all the demands for coal that poured in on them, and many of the larger concerns positively declined to fill orders from occasional buyers or to trouble themselves about transient trade, giving their whole attention to getting forward coal to the firms with which they had contracts. Car supply during the late summer and early fall showed some variation, but was never over 85 per cent. of the total demand, and sometimes was as low as 50 per cent. Vessel rates held up and those concerns which had taken delivered contracts on a basis of 75c. from Philadelphia to Boston saw trouble ahead and prepared

themselves for it as best they could. Coal was by this time commanding a premium of 25c. a ton for immediate delivery, and the general position of the trade was the best in twenty years. A strike in the New River field interfered with production there for a short time and made consumers uneasy.

In October the pressure on producers became even heavier. Consumers were anxious to lay in supplies for the winter in season, fearing interruptions of shipments by storms. Manufacturers had little relief as regards their water power supply and were taking all the coal they could get. Those producers who had taken delivered contracts or had large numbers of contracts for season's supply were now in hot water. Vessel owners and captains saw their opportunity and became very firm regarding freight rates. As a result there was a panic, ocean freights went up to exorbitant figures, \$3 from Philadelphia to Boston, shippers took vessels weeks ahead and paid heavy demurrage charges to hold vessels at the shipping ports. Naturally the price of coal for prompt delivery went up also, and all sorts of prices were paid, one lot being sold for delivery at a Sound port for \$4 a ton. The average advance, of course, was nowhere near as great as this, but it is safe to say that the average price at Philadelphia was over \$2 a ton. Another remarkable fact was that at many Eastern points bituminous coal actually sold for more than pea and broken sizes of anthracite, something that had not happened before in 25 years or so, certainly not since the opening of the West Virginia coal fields. There were general fears of a coal famine at all manufacturing centers, but an unusually mild and open November, with fine weather until the middle of December, proved a blessing to both shippers and consumers. Coal went forward in large amounts, producers had a chance to catch up with the orders that had piled in on them, and all the shoal water ports down East managed to lay in coal enough to last them over winter before navigation closed, late in December.

The Chicago Coal Market in 1899.

By Our Special Correspondent.

Anthracite Coal.—The year 1899 goes into history with regrets from about every anthracite coal shipper or dealer doing business here. As a money maker for coal people it surpassed any of the past 10 years, enabling many men to partly recoup losses of previous years. The year started with a splendid trade, and throughout the entire twelve months the demand for hard coal has been so strong that there has been an absolute scarcity ever since July. Chestnut size was in such great favor that its price was at a premium about all the year. The features of 1899 were the advanced price on anthracite, the shortage of vessels and cars and the high freight rates. Prices of hard coal opened the year at \$4.50@4.75 and advanced by jumps of 25c. per ton; it closed the year selling at \$5.75 for egg and stove, while chestnut stood at \$6. Coal receipts by the lakes, at Chicago, were very much lower than in 1898 and the railroads also were unable to bring much coal here, the general demand for boats and cars having been so large that freight rates were at times almost prohibitive against coal shipments. Some idea of the advanced freight rates may be gleaned from the fact that in 1898 the cost of carrying coal by the lakes averaged 28c. per ton, while in 1899 the cost had increased to 72c. on the average. Chestnut coal was in short supply almost the entire year, and it will take months of 1900 to catch up, for the demand continues right along and no progress in filling the shortage has yet been made.

Bituminous Coal.—Activity in soft coal has been a feature all the year. The demand from manufacturers has been enormous, while the railroads have absorbed a splendid tonnage. Prices have jumped 25c. to \$1 a ton, ending the year high and very steady. Lack of cars for bringing coal here greatly interfered with business, and there is said to be a shortage of 200,000 tons of soft coal as compared with last year's figures. Great manufacturing activity has been the real cause of the immense business done, contracts having been made from time to time, five or even ten times larger than contracts placed in any of the previous five years, and this may be likewise said of the railroads. Profits to the dealers have doubtless been large, and with coal in more plentiful supply would have been much larger. The year closed with a splendid business on, but apparently no betterment in hauling facilities.

Coke.—Throughout the year the demand for coke has been vastly larger than the supply. Contracts have been made for coke of any kind, and every grade of coke offered has been snatched up. Dealers were all sold out three months before the close of the year and they practically made their own prices, premium rates having been on for at least six months, or from July to close of year.

The Pittsburg Coal Market in 1899.

By Our Special Correspondent.

The year 1899 was a stirring one in the coal trade of the Pittsburg District. It opened with coal selling at lower prices than ever ruled in this market and closed with the stiffest rates charged for years. The slashing of rates to secure trade is a thing of the past; consumers will now be required to assist in making up for the past losses of the operators. This changed condition of affairs is due to the formation during the year of two strong combinations of coal operators. The interests of the operators who ship by rail were consolidated into one company and the interests of the river shippers into another. It was a big task to bring about the good results that followed many months of hard labor on the part of the projectors. J. C. Dysart and U. A. Andrews were the promoters of the Pittsburg Coal Company, the railroad consolidation. The capital stock is \$64,000,000, divided into \$32,000,000 of preferred stock and the same amount of common stock. The company is composed of 104 concerns and began to do business on October 1st. At that time 1½-in. coal, which is most generally used, was selling as low as 85c. a ton at the mines. Since the consolidation the price has advanced to \$1.25 a ton.

The river coal combination was the most difficult to complete on ac-

count of the many different interests, mines, steamboats, coal boats, barges, docks and elevators. John H. Jones, one of the leading river coal operators, was the principal promoter of the big undertaking, and worked energetically for its success. J. B. Finley, a banker, took charge of the project, and with the aid of W. B. Rodgers, S. S. Brown, Hugh Moren and other large operators, formed the Monongahela River Consolidated Coal and Coke Company. The capital stock is \$30,000,000, divided into \$10,000,000 bonds, \$10,000,000 preferred stock and \$20,000,000 of common stock. The combination began doing business on October 1st, when the price of coal delivered at Pittsburg was about 95c. a ton. The price has since been advanced to \$1.30 a ton for 1¼-in. screened coal. The river coal trade was not good during the year owing to the continued low water in the rivers. No coal was shipped south from May 20th to December 13th. The local trade, however, was better than in 1898. About 4,300,000 tons of river coal was sold in the local market during the year. What the operators lost in being unable to ship coal south was partially made up by the December shipment, which netted the combination a profit of over \$500,000.

The outlook for 1900 never was brighter in any industry than for the coal business in the Pittsburg District.

SHIPMENTS OF COAL FROM PITTSBURG BY THE OHIO RIVER.

Year.	Cincinnati	Louisville and South	Total.	Year.	Cincinnati	Louisville and South	Total.
	Tons.	Tons.	Tons.		Tons.	Tons.	Tons.
1884.....	985,240	1,232,040	2,217,280	1892.....	973,565	1,519,960	2,493,525
1885.....	1,303,000	1,683,360	2,986,360	1893.....	879,950	1,617,840	2,497,790
1886.....	1,329,160	1,531,406	2,860,566	1894.....	1,199,920	1,353,280	2,553,200
1887.....	83,690	1,438,920	2,220,720	1895.....	984,400	1,384,080	2,368,480
1888.....	2,353,560	2,340,520	4,694,080	1896.....	29,760	2,578,120	4,607,880
1889.....	1,214,400	1,515,800	2,730,200	1897.....	1,114,568	922,800	2,037,368
1890.....	1,304,640	20,42,160	3,346,800	1898.....	1,236,800	1,319,120	2,555,920
1891.....	1,125,000	1,931,600	3,056,600	1899.....	1,000,000	1,185,500	2,185,500

The river shipments, though less than the great total of 1896, exceeded those of any other year since 1891. They show that Pittsburg, in spite of competition, retains a strong hold on the river coal trade.

Utah Coal and Coke Production in 1899.

By Our Special Correspondent.

Of the 20 coal companies, or mines or groups of mines, in Utah, owned by different people, the Pleasant Valley Coal Company, which is closely allied to the Rio Grande Western Railway, does the entire general trade, the others only supplying limited local areas and special needs. The Pleasant Valley Company has the only coke-making plant in the State. In 1899 it did a phenomenal business, marketing 780,540 short tons, as against 537,473 tons, the prior year, which was a new record. Sunnyside, a new mine, which began shipping the last days of November, produced 9,500 tons, and this really ought to figure in the Pleasant Valley total, as to all intents and purposes it is a part of its belongings. Coke marketed in 1899 was 26,700 short tons, compared with 28,327 in 1898. It takes 3 tons of Pleasant Valley coal to make a ton of coke and as in above total—780,540 tons—the 80,100 tons charged to coke ovens, is included, this should be deducted if it is desired not to duplicate the coal tonnage marketed as coke. The Pleasant Valley Company's pay roll for the past year was \$732,000, which does not include Sunnyside. In December, with a coal production of over 100,000 tons, there are 800 men employed. The Pleasant Valley Company receives \$1.65 to \$1.95 per ton for its coal, the railroad charges \$2 to \$2.50 per ton freight, and the local dealer gets 50c. per ton additional. Recently the price of coal has been advanced 50c. per ton, which is divided between the railroad and the mines. Coke delivered at smelters is \$7.50 per ton.

The Weber Coal Company produced 11,956 tons, value \$17,192, cost \$13,663; and this represents 5,833 days' labor.

With this explanatory outline, the following summary may be made: Pleasant Valley Coal Company marketed all told 780,540 short tons of coal and 26,700 tons coke, or total tons of coal not included in coke-making, 700,440; Sunnyside Mine, 9,500; total coal marketed over Rio Grande Western Railway, 709,940 tons; Weber Coal Company, 11,956 tons; all other Utah coal mines, local trade, etc., 80,500 tons; total of coal marketed, 802,396 short tons. The total coke marketed was 26,700 short tons.

PETROLEUM IN 1899.

There has been a marked improvement in the production of petroleum in the United States during the year 1899, especially in Pennsylvania and Ohio, where the discovery of several phenomenal gushers was made. In the newer fields, such as California and Texas, increased work has also been done, though the production in Texas is still limited owing to the comparatively small area. The total production of all States in 1899 was 54,048,100 bbls., valued at \$62,911,637, showing an increase of 2,273,635 bbls., in quantity, and \$20,811,115 in value, as compared with 1898.

An encouraging feature of the industry—and one which has been awaited for a considerable time past—is the advanced prices which the producers have realized during 1899. It is fair to assume that the advance in nearly all regions has been fully 60 per cent. since the early months of 1898, and present indications are that still higher prices will rule in 1900.

Another satisfactory branch of the industry is the increased exports of crude oil, naphthas, illuminating oil, lubricating oil and paraffine. These exports in 1899 amounted to 855,208,322 gals., showing an increase of over 7,000,000 gals. as compared with 1898, notwithstanding the keen competition of Russia, in the other European and far Eastern countries. On the other hand we note a falling off in the exports of residuum, which includes tar and all the other products from which the lighter oils were distilled, from 138,873,412 gals. in 1898 to 102,479,834 gals. in 1899. The exports of all mineral oils in 1899 were made largely to the

United Kingdom and Germany, although a good share went to France and the far East.

The leading oil producing district in the United States is the Appalachian Field, which includes New York, Pennsylvania, West Virginia and Eastern Ohio. The total output in this region in 1899 was 33,158,664 bbls., showing an increase of 1,229,074 bbls. over 1898. The shipments during the past year, however, were 189,495 bbls. less than 1898, being 30,216,441 bbls., against 30,405,936 bbls. But on the other hand the average price of ordinary Pennsylvania oil at well increased from 65c. per bbl. in January, 1898, to about \$1.65 in December, 1899; Tiona from 75c. to \$1.80, and New Castle, 40c. to \$1.36. The average price of crude Pennsylvania in 1898 was only 91½c., while in 1899 it was \$1.29. There were completed in the region in 1899 new wells to the number of 7,026, which had an average daily output of 7,723 bbls., while the dry holes numbered 1,543, and on December 31st, 1899, there were drilling 656 wells and 407 rigs were being put up.

The Ohio Region showed a material increase in production in 1899, as a result of the successful development of the Scioto and Marietta fields. The total number of new wells completed during the year in both the Buckeye and Southeastern districts was 5,331, which had an average daily output of 7,645 bbls. The dry holes reported numbered 751, while on December 31st there were 418 wells drilling and 133 rigs being built. Prices received at well were considerably better than 1898. At Barnesville the price increased from \$1.05 in January to \$1.51 in December, 1899, as against 55c. and \$1.07½ in 1898. Corning oil advanced from 48c. per bbl. in January, 1898, to \$1.44 in December, 1899; North Lima Indiana has also made a good showing for the year. There were completed during the year 1,064 new wells, which had a daily output of 1,744 bbls. The number of dry holes reported was 110, while on December 31st 82 wells were drilling and 56 rigs were being built.

In California the production shows an increase. The total amount reported in 1899 was 2,365,000 bbls., against 2,249,088 bbls. in 1898. A

Much attention is being given to the use of petroleum as fuel for locomotives, etc., and it is likely that we shall see an increased consumption in this direction in the near future.

SALT IN 1899.

The production of salt in the United States in 1899 amounted to 19,025,794 bbls. of 230 lbs. each. The increase over 1898 was moderate only, amounting to 269,400 bbls. As heretofore, the production came chiefly from New York, the Ohio Valley, Michigan, Kansas, Louisiana, Utah and California. An increasing quantity of salt was used in 1899 in making alkali, owing to the establishment of some large chemical works in Michigan and Ohio.

The Michigan State Salt Inspector reports for the fiscal year ending November 30th, 1899, a production of 4,732,669 bbls. in the State, which is a gain of 282,131 bbls. over the preceding year. Several new works were established, while others were enlarged. The increase in the production of salt came from Manistee and Wayne counties. Two companies have been organized in Port Huron for the manufacture of salt. The deep salt well on the premises of the North American Chemical Company, near Bay City, is now down 3,300 ft., with indications that rock salt will soon be reached.

Preparations have been made during the year for the extended working of some of the large salt deposits in southwest Louisiana.

Utah Salt Production in 1899.

By Our Special Correspondent.

In the review of the manufacture and marketing of salt in Utah for 1898 particulars were given of the formation of a consolidated corporation—the Inland Crystal Salt Company—the promoters of which ob-

THE LIST PRICES PER SQUARE FOR NO. 1 ROOFING SLATE OF STANDARD BRANDS.—F. O. B. quarries.

Size in Inches.	Monson or Brownville.		Bangor.		Bangor Ribbon.		Albion or Jackson—Bangor.		Lehigh.		Peach Bottom.		Sea Green.		Unfading Green.		Red.	
	1898.	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.	1899.	1898.	1899.
24x14.....	\$6.10	\$6.10	\$3.50	\$3.35@3.50	\$3.00	\$2.90@3.00	\$3.25	\$3.10@3.35	\$3.50	\$3.25@3.50	\$4.85	\$4.85@5.10	\$2.50@3.00	\$2.50@3.00	\$3.50	\$3.50@3.75	.....	.....
24x12.....	6.60	6.60	3.50	3.35@3.50	3.00	2.90@3.00	3.25	3.10@3.35	3.50	3.25@3.50	5.00	5.00@5.25	2.60@2.90	2.50@3.00	3.50	3.50@3.75	.....	.....
22x12.....	6.60	6.60	3.60	3.50	3.00	2.90@3.25	3.25	3.10@3.50	3.50	3.00@3.50	5.00	5.00@5.25	2.60@2.95	2.50@3.00	3.50	3.50@3.75	.....	.....
22x11.....	6.50	6.50	3.60	3.50@3.75	3.10	3.00@3.25	3.25	3.10@3.50	3.75	3.00@3.75	5.00	5.00@5.25	2.75@2.95	2.75@3.25	3.75	3.75@4.00	.....	.....
20x12.....	6.90	6.90	3.60	3.50@3.75	3.10	3.00@3.25	3.25	3.10@3.50	3.75	3.35@3.75	5.00	5.00@5.25	2.60@2.95	2.50@3.00	3.75	3.75	.....	.....
20x10.....	6.80	6.80	4.25	4.00@4.50	3.35	3.25@3.50	3.50	3.35@4.00	3.80	3.60@3.80	5.10	5.00@5.35	2.75@2.95	2.75@3.25	4.00	4.00@4.25	\$10.50	\$9.00@10.00
18x12.....	6.80	6.80	3.60	3.50@3.75	3.25	3.10@3.50	3.25	3.10@3.50	3.80	3.60@3.80	5.10	5.10@5.35	2.60@2.95	2.50@3.00	3.50	3.50	.....	.....
18x10.....	7.20	7.20	4.25	4.00@4.50	3.35	3.25@3.50	3.50	3.35@4.00	3.80	3.60@3.80	5.10	5.10@5.35	2.60@2.95	2.50@3.00	4.00	3.75@4.00	10.50	9.00@10.00
18x8.....	7.10	7.10	4.40	4.00@4.50	3.35	3.25@3.50	3.50	3.35@4.00	3.80	3.60@3.80	5.10	5.10@5.35	2.60@2.95	2.50@3.00	4.00	3.75@4.00	10.50	9.00@10.00
16x12.....	6.80	6.80	3.60	3.50@3.75	3.25	3.10@3.50	3.25	3.10@3.50	3.80	3.60@3.80	5.10	5.10@5.35	2.60@2.95	2.50@3.00	3.50	3.50@3.75	.....	.....
16x10.....	7.10	7.10	4.00	3.75@4.25	3.25	3.10@3.50	3.25	3.10@3.50	3.80	3.60@3.80	5.10	5.10@5.35	2.50@2.90	2.40@2.85	4.00	3.50@4.25	10.50	9.00@10.00
16x8.....	7.00	7.00	4.25	4.00@4.25	3.25	3.10@3.50	3.25	3.10@3.50	3.80	3.60@3.80	5.10	5.10@5.35	2.50@2.90	2.40@2.85	4.00	4.00	10.50	9.00@10.00
14x10.....	6.60	6.60	3.60	3.50@3.75	3.25	3.15@3.25	3.25	3.10@3.35	3.75	3.25@3.75	.....	.....	2.25@2.85	2.25@2.75	3.75	3.75	10.50	9.00@10.00
14x8.....	6.50	6.50	3.75	3.50@3.75	3.25	3.15@3.25	3.25	3.10@3.35	3.40	3.25@3.40	4.85	4.85@5.10	2.20@2.45	2.20@2.75	4.00	4.00@4.25	10.50	9.00@10.00
14x7.....	6.40	6.40	3.90	3.50@3.75	3.25	3.15@3.25	3.25	3.10@3.35	3.40	3.25@3.40	4.85	4.85@5.10	2.15@2.20	2.20@2.50	4.00	4.00@4.25	10.50	9.00@10.00
12x8.....	5.50	5.50	3.25	3.25@3.50	.....	.....	3.25	3.10@3.35	3.25	3.25	4.60	4.60@4.85	2.15	2.20@3.50	3.25	3.25@3.50	9.00	8.40@8.80
12x7.....	5.00	5.00	3.25	3.25	.....	.....	3.25	3.10@3.35	3.25	3.25	4.60	4.60@4.85	.....	.....	3.25	3.25@3.50	9.00	8.40@8.80
12x6.....	4.80	4.80	3.25	3.25	.....	.....	3.25	3.10@3.35	3.25	3.25	4.60	4.60@4.85	1.95	2.20@2.50	3.25	3.25@3.50	8.50	8.40@8.80
Av. Price.....	6.50	6.50	3.75	3.75	3.20	3.20	3.35	3.40	3.40	3.50	4.95	5.05	2.35	2.65	3.70	3.85	10.10	9.25

In Brownville and Monson delivery quotations can be had somewhat lower than above which is also true of all other brands. No. 1 Bangor are 50c. extra when full 1/4 in thick. Purple variegated and mottled and intermediate sea-green slates have fluctuated proportionately to the above brands.

number of large companies have been formed to work the oil-bearing lands in Los Angeles, Ventura, Fresno, Santa Barbara, Orange and Santa Clara counties, and some of them are now paying regular dividends to their stockholders. One of the most active districts to-day is that of Kern-River, which is about six months old, and during that time at least 20 wells have been shot and are now producing oil. As a result of the increased work in the oil-fields of the State the California Oil Exchange has been established in San Francisco to further the interests of the industry, and to-day it is doing a fair amount of business.

In Texas the Corsicana oil-field produced about 600,000 bbls., or 55,000 bbls. more than in 1898. The industry is confined to a few large concerns and the oil is used chiefly as fuel.

PETROLEUM PRODUCTION IN THE UNITED STATES. (Barrels contain 42 gallons.)

District.	1898.		1899.	
	Barrels.	Value.	Barrels.	Value.
Appalachian Region.....	31,100,360	\$28,340,203	33,158,664	\$42,774,677
Ohio (Lima).....	13,377,590	8,310,496	13,443,425	12,157,897
Indiana (Lima).....	3,751,307	2,208,582	3,772,011	3,411,313
California.....	2,249,088	2,376,420	2,365,000	3,429,250
Colorado.....	650,000	532,500	600,000	600,000
Kansas.....	88,000	57,200	90,000	67,500
Wyoming.....	3,500	18,349	4,000	36,000
Texas.....	544,620	326,772	600,000	420,000
Other States.....	70,000	10,000	15,000	15,000
Totals.....	51,774,465	\$42,100,522	54,048,100	\$62,911,637

The Colorado oil industry at Florence was less this year, the output being placed at 600,000 bbls., against 650,000 bbls. in 1898.

Kentucky and Tennessee have both produced a comparatively small amount of oil, the former at Otto Creek, near Somerset, and the latter in Fentress County.

In Kansas the oil industry was fairly active, and the production was about 90,000 bbls.

In Wyoming the increase in production was not large and the industry is still confined to rather small limits, owing to the lack of transportation facilities.

ject to its being styled a trust. Its stiffening the price of crude solar salt proved an incentive to some Davis County people to enter the field and fully 7,500 short tons were turned out the past season, other than that manufactured by the Inland Crystal Salt Company. The total amount of crude solar salt evaporated from the waters of Great Salt Lake in 1899, is given at 62,000 tons of 2,000 lbs., and the stock on hand at the beginning of 1899 was in the neighborhood of 30,000 tons.

The consolidated company, in reaching out to cover the Utah salt-field as far as possible, first absorbed the plants of the Inter Mountain Salt Company, that of H. S. Stowe of Salt Lake, leased the plant of the Nebo Salt Manufacturing Company at Nephi. Early in 1899 the plant of the old Deseret Salt Company—that of Williams & Wallace—and the G. Williams plant, known as the Solar Crystal Salt Company, as well as nearly all vacant land bordering the lake shore as far as Promontory, available for salt making by the solar process, were added to its belongings. Still it is not altogether master of the situation, though it has succeeded in keeping up prices, so that to-day there is a safe margin of profit in the business, which was hardly true prior to the consolidation, when competition was active.

But little refining was done in 1899 aside from that of the Inland Crystal Salt Company, mainly because the outside smaller refiners were not able to get crude salt until the season was nearly at an end. The fact that there is now full 7,500 tons of crude salt in the hands of outside dealers indicates pending competition, if this product is not purchased by the Inland Company. Prices for crude salt have ranged from \$1.50 to \$2.50 per ton for bulk and from \$3.00 to \$4.50 for sacked. The average price for refined salt has been about \$10 f. o. b. cars. These are material advances, indicating a profitable year. Production of mineral rock salt has slightly increased, a natural sequence of the advance in the price of crude solar salt. Sabina has received the chief benefit from this traffic, as the output of Nephi rock salt has remained about normal. The plant of the Nebo Salt Manufacturing Company was idle most of the past year.

Shipments of the various products marketed throughout the inter-mountain region, as well as to California and North Pacific Coast points, may be thus summarized:

Refined solar salt.....	13,000 tons
Refined salt by boiling and reducing rock salt.....	750 tons
Crude salt for stock feeding purposes, sacked and bulk.....	3,500 tons
Crude salt for chlorinating purposes, sacked and bulk.....	14,500 tons
Artificial rock salt.....	500 tons
Native rock salt mined.....	3,500 tons
Total.....	35,700 tons

On the threshold of 1900 the outlook for the Utah salt traffic is brighter than for several years, and perhaps the best proof of this is that the management of the Inland Crystal Salt Company maintains the contrary.

SULATE IN 1899.

It is a long time since the slate industry has been in such good condition as during the year 1899. There has been a healthy demand for nearly all kinds of slate for consumption, though the export trade has fallen off somewhat owing to increased competition. Perhaps the most encouraging feature is the good prices that have been paid both at quarry and in the open market for roofing slate, as well as for blackboards, school slates and other manufactured stock. In fact, quarrymen are so well pleased with the year's profit from the home trade that many of them have withdrawn from the foreign market. The year closes with prospects of much activity in 1900.

In Pennsylvania the manufacture of roofing slate shows an increase over last year, owing to the resumption of work at several of the largest plants that had been shut down owing to labor troubles. Efforts have been made at various times during 1899 to form an agreement among the quarrymen, but outside of the Bangor Association nothing seems to have been done, the trouble being that each quarryman sought a bigger allotment of production than was practicable to the successful operation of such an agreement. In the Peach Bottom region the quarrymen understand each other pretty well. A notable feature in the slate industry in Pennsylvania is that the railroads are enlarging their interests in the quarries, especially in and around Bangor. The school slate industry is also in close hands, three of the largest factories in the world having passed into the control of the National School Slate Company, organized early in the year. The mill stock manufacturers in the Northampton and Lehigh regions have agreed to maintain prices; at times there was underselling, but this was not serious enough to demoralize the whole trade. The consumption of slate by the electric companies has been on the increase, this business being done principally by electric supply houses. There has also been more business done in powdered slate for pigment and for manufacturing cement. The shipments of roofing slate from two of the leading railway stations—Slatington and Walnutport—for the 11 months ending November 30th amounted approximately to 204,673 squares, which compares with 185,750 squares in the corresponding period last year, showing an increase of 18,923 squares, or about 9 per cent. The movement of school slates in the same period in 1899 amounted to 17,565 cases, against 19,121 cases last year, showing a falling off of 1,556 cases. The blackboard shipments aggregated 24,140 crates, against 26,312 crates in 1898, or a decrease of 2,172 crates. The shipments from Danielsville were large, and varied from 1,485 squares of roofing slate in February to 5,104 squares in July, while the movement in blackboards was smallest in May—93 crates—and largest in August—463 crates and 2 cars. The shipments of flagging were also large, the largest being recorded in February—607 crates—and the smallest in August—90 crates. In Slatington blackboards were sold early in the year at 10c., 11c., and 12c. per square foot, according to size, and later the increased cost at quarry enhanced values several cents. Slate flour, greenish, at one time sold at \$11.25 per ton, and other kinds, finely bolted, at \$9.25, f. o. b., New York, but prices were later advanced.

In the New York-Vermont District the slate industry has been favored by the investment of new capital from abroad, an English syndicate buying up several quarries for the purpose of shipping the product to Great Britain. The quarrymen operating the larger properties have been much pressed for roofing slate owing to the increased demand at home, and the prices they have been getting compare very favorably with any heretofore obtained. Though the consumption of the various colored slates has increased, it is claimed, the production has been kept well in hand, and so the year 1900 will open with the banks pretty clear of stocks, which promises a further improvement in trade. In the red slate region a new producer—the National—has caused some competition with the Eureka quarries.

The mill stock manufacturers have been hampered by delayed shipments of slate from the quarries. At the opening of the year large makers of mantels were booking orders at 50c. to 80c. per superficial foot, but later were compelled to ask more, which rather restricted consumption, as this product competes with Vermont marble.

In Georgia some capitalists have taken hold of the industry, expecting to manufacture roofing slate and slate for electric switchboards,

SULATE PRODUCTION IN THE UNITED STATES.

	1898.				1899.			
	Roofing Squares.	Value.	Mfrs. Value.	Total Value.	Roofing Squares.	Value.	Mfrs. Value.	Total Value.
California.....	400	\$2,800	.....	\$2,800	800	\$6,000	.....	\$6,000
Georgia.....	3,815	14,419	.....	14,419	2,500	12,500	.....	12,500
Maine.....	26,389	112,949	\$66,484	179,429	28,000	140,000	\$68,500	208,500
N. Y. & Vermont	377,752	717,729	62,812	780,541	378,420	804,500	56,642	861,142
Pa., Bangor.....	.....	.....	.....	.....	.....	.....	.....	.....
" Lehigh.....	639,610	1,810,096	390,000	2,371,322	659,736	1,979,208	376,300	2,355,508
" F. A. & W. G. ....	.....	.....	.....	.....	.....	.....	.....	.....
" Chap. Quar.	25,753	69,448	.....	69,448	25,300	75,900	.....	75,900
Pa., Md. (P. Bot.)	23,335	101,778	.....	101,778	24,396	103,195	.....	103,195
Virginia.....	38,548	125,281	8,560	133,841	36,000	126,000	9,000	135,000
Other States....	1,000	4,000	1,000	5,000	500	2,000	3,600	5,600
Totals.....	1,136,632	\$2,958,496	\$528,856	\$3,487,352	1,155,632	\$3,249,398	\$514,042	\$3,763,440

etc. It was the intention of the promoters to export the slate. Efforts were made to float the property in the East, but with what result is not yet known.

In Tennessee and Virginia some work was done at the quarries, but

the production is still limited. In Colorado new discoveries of marketable slate were reported near Marble, and quarries were to be opened, though we have yet to hear from them. In Utah renewed efforts were made late in the year to revive the slate industry, and new capital has been invested. The same applies to California, the supplies of which are used principally in that State.

Export Trade.—The increased production at the Welsh quarries and subsequent keen competition, coupled with higher freight rates owing to the scarcity of vessel room, have combined to lessen the export movement from the United States. In the accompanying table we give the monthly values of exports from the United States, the figures for November and December of this year being estimated.

Taking the exports from New York alone, which is the principal port of shipment, we find a decrease of fully \$180,000, or 17 per cent., from last year's movement. This falling off was due chiefly to the smaller shipments of roofing slate to British territory. We have collated the following figures for the 10 months ending October 31st, covering the exports from New York: To United Kingdom, \$530,265; Australasia, \$83,869; Germany, \$38,332; Denmark, \$27,405; Belgium, \$16,675; India, \$10,655; Norway and Sweden, \$3,537; Holland, \$4,415; South Africa, \$3,219; South America, \$4,016; Central America, Mexico and the West Indies, \$6,381; China, Canada and the Hawaiian Islands, \$1,144, making a total of \$729,903, against \$859,401 in the corresponding 10 months in 1898.

The total exports of roofing slate from New York in the 10 months amounted to 132,250 squares, showing a decrease of about 40,000 squares, as compared with the same time in 1898. Much the larger part of this roofing slate went to the United Kingdom, while Australia held second place, and Germany, Belgium, Denmark and neighboring countries on the Continent of Europe the balance. School slates were forwarded to India, South Africa, Central and South America, the West Indies, Mexico, Hawaiian Islands and China, while mill stock was ordered by Canada and the principal European countries, including England.

The freight market was higher than last year, and rates to London from New York fluctuated between 13s. and 20s., the latter figure being obtained late in 1899. Some contract room was filled at lower rates, and occasionally an outside steamer in want of ballast took slate around 10s. The freight rates to other ports were correspondingly higher, and

UNITED STATES SLATE EXPORTS.

Month.	New York.		Other Ports.		Total U. S.	
	1898.	1899.	1898.	1899.	1898.	1899.
	January.....	\$86,480	\$48,324	\$20,358	\$30,905	\$106,838	$79,129
February.....	50,482	76,797	30,394	28,370	80,876	105,167
March.....	91,889	96,536	31,666	35,911	123,555	132,447
April.....	73,698	72,941	24,165	44,992	97,863	117,932
May.....	112,285	106,266	24,910	48,151	137,195	154,427
June.....	97,050	68,831	34,956	20,872	132,006	89,708
July.....	93,533	65,474	30,599	43,912	124,132	109,396
August.....	80,305	68,100	45,743	37,840	126,048	105,940
September.....	93,751	72,843	32,931	33,029	126,682	95,872
October.....	79,328	53,891	25,415	7,351	104,743	61,242
November.....	75,220	60,154	29,753	12,000	104,973	72,154
December.....	76,063	50,000	20,570	8,000	96,633	58,000
Totals.....	\$1,010,684	\$840,057	\$352,460	\$341,343	\$1,363,144	\$1,181,400

Australasian steamer room was worth at different times as low as 15s. and as high as 30s., though little slate was shipped at the latter figure.

Such high rates have been detrimental to the exporters, inasmuch as they had booked large orders at old prices and at a comparatively small freight rate. This naturally resulted in considerable shopping among the quarrymen for cheaper slate, and in several cases we understand exporters have had little or no profit on their orders. Under these conditions there is a probability that the year 1900 will see a further decrease in exports but it is expected that the home trade will consume a good part of the production at satisfactory prices.

There has been a material increase in the production of slate throughout the leading countries of the world. The United Kingdom continues to hold first place, with about 51 per cent. of the total to its credit. France is second with 26 per cent. and the United States third with 21 per cent. The value of the total production of the world in 1899 was \$17,780,845, showing an increase of \$349,980 as compared with 1898, and \$4,304,080 more than 1896.

The value of the total production of slate in the United States in 1899 was \$3,763,345, showing an increase of \$362,549 as compared with 1898. Of the output in the past year 1,155,652 squares of roofing slate were valued at \$3,249,303, against 1,136,632 squares, valued at \$2,958,496, in 1898. The mill stock produced in 1899 was valued at \$514,042, against \$528,856 last year. This falling off in manufactured slate was due largely to the scarcity of suitable raw material.

Foreign Countries.

Australasia.—Practically only two colonies—Queensland and Victoria—have produced marketable slate in recent years. In 1898 and 1899 the output from Victoria has diminished, while that of Queensland amounts to about \$20,000 annually.

Belgium.—An increased production is noted, especially in the districts of Luxembourg and Namur, where roofing slate is manufactured principally. This country holds fourth place with an output valued at about \$390,000 in 1899, or \$121,500 more than in 1896, showing an increase in four years of over 30 per cent. On the other hand, the imports have grown less.

Canada.—The quarrying industry has been neglected, dropping from \$75,550 in 1894 to about \$38,000 in 1899. This slate has come almost entirely from the Province of Quebec, although black, red and green slate quarries exist in British Columbia and Nova Scotia. On the other hand, imports have increased in recent years, especially from the

United States, notwithstanding the duty of 25 per cent. on roofing and 30 per cent. on manufactured slate imposed by the Canadian Government. Some exports were made up to 1896, but since then the trade has disappeared altogether.

France.—This is the second largest producer in the world, and in late years the value of its slate has increased materially. In 1899 the total value was about \$4,500,000. The principal sources of supply are the districts of Maine-et-Loire and the Ardennes. In the South of France slate is used for many purposes besides roofing. Roofing tiles from Angers cost, at Nice, from 52 fr. to 62 fr. (\$10.04 to \$11.97) per thousand, while the Lavagna slab slate (which is dark gray and inferior in quality) for balconies, costs 10.50 fr. (\$2.03) per lineal meter for size 35.4 by 37 in., and 12 fr. (\$2.32) per square meter for 37.4 by 46 in. Window shelves, with cut step window shutter in closing, 47.2 by 7.8 to 9.8 in., are worth 2.40 fr. (46c.) each, while window tops with mould-

tariff from importation into the United States. Prices were well maintained in England, but cutting was experienced in the earlier months of the present year in the United States. Mutual arrangements were arrived at in regard to domestic trade, but increased competition due to the Columbia Chemical Company beginning to erect works at Barberton, O., will probably disturb the market for next year. Ruling prices have been 60c. to 70c. contract and 80c. to 90c. market.

Leblanc soda is still decreasing in demand. Shipments to the United States have not been very extensive, prices ruling slightly higher than ammonia soda.

Bicarbonate of soda has ruled generally active; prices being on the decline. The increased production, due to works being erected at Laramie, Wyoming, increased facilities for production at the Pennsylvania Salt Company's Works, the utilization of carbon dioxide from large breweries in Milwaukee, together with the general packing trade of the J. B. Ford Company, and close competition, will cause further decline.

Crystal carbonate in the States is manufactured by only one works, but the demand is increasing and others are liable to undertake this manufacture. There has been less demand shown for sal soda, particularly for foreign manufacturers, but the general market has remained fairly active. Prices ruling: Casks, at from 50c. to 60c. and kegs, 60c. to 70c. In several large towns works have been established in the past year where sal soda is manufactured from soda ash, notably Chicago, New York, Milwaukee and Pittsburg. They are able to meet the demand in their own localities and make a profit, due to difference in freight between soda ash and sal soda, no freight being paid in carrying the water of crystallization profits are small. A further demand has been created in the increased use for bicarbonate of soda by the manufacturers of carbonated waters, while mono-hydrate of soda, shows a slightly increased demand, due to fresh markets being opened up.

Domestic makers of caustic soda by the electrolytic process have still to expect the increasing demand for soda ash, and the consequent displacement of caustic, as large soap makers continue to put in plants for the manufacture of caustic from ammonia soda ash.

With the prevailing prices and contracts made for soda ash in bulk, caustic from the electrolytic process will have to be sold in very close competition. The increasing demand for heavy chemicals is dependent to a large extent on the increasing prosperity of the population and directly dependent on the advancement of civilization. Comparisons have been made on the quantities of soda products per head of population in various countries, for instance, Canada 4, United States 5½, England 7.

The demand for bleach in the United States has been extremely active in regard to imports, notwithstanding the increased tariff of two years ago, and the increase in domestic manufacture. The problem of the future is to what extent chlorine can be utilized in the various manufactures.

The increasing quantities of sulphite and wood pulp for paper manufacturers means a proportionate decrease, over the older methods, of manufacturing paper from rags, esparto, straw, jute, etc., since the former process does not require so much chlorine to bleach the pulp as the latter. Textile industries are, however, creating somewhat increased demand in this direction.

Greater activity has been shown in the United States, England, France and Germany for the manufacture of electrolytic chlorine. English works by the older processes still continue to keep active, notwithstanding the onslaught of the various electrolytic processes; greater economics in the manufacture of hydrochloric acid and bleach have been brought about, and managerial and brokerage expenses cut down. Improvements in the machinery have been extremely infrequent. The future existence of Leblanc works is dependent entirely on the by-products and the higher grade heavy chemicals.

Great things are expected in the immediate future in the electrolytic processes of manufacture in the alkali trade. It is generally acknowledged that these processes will not affect the alkali so much as the chlorine industry, and that they will be ultimately regarded as chlorine processes, producing caustic soda as a by-product, the soda market being still largely maintained by the ammonia soda process and the natural soda.

The introduction of these processes will, however, cause the centers of manufacture to shift from localities where coal is cheap to localities where water power can be obtained easily, consistent of course with a good supply of raw material and reasonable transportation facilities. No doubt great cutting of prices will result, before the electrolytic processes can be firmly established, owing to over production, but by reason of the enormous amount of capital invested in the older processes they will die hard, and the electrolytic processes will have to deal with keen competition at the early stages of their introduction. Ammonia soda cannot possibly be displaced for the manufacture of soda ash by an electrolytic method and bicarbonate of soda is in the same situation. The only fields that seem likely to have any tendency toward displacing soda ash by the ammonia soda process are the natural soda fields and springs in the Western States.

Wyoming and Kansas show great advantages which will be taken advantage of as the population and transportation facilities increase. Soda ash can be manufactured from salt by the ammonia soda process at a cost of \$9 a ton. The Western fields with fuel equal to the Central and Eastern fields can produce soda ash at a cost of not over \$7 a ton.

Bicarbonate of soda is already reaching the Middle-Western markets from these States, and is coming in direct competition with Middle-Eastern manufacturers. Their inexhaustible supply shows that these States will have to be reckoned with. The extreme Western market and Pacific Coast shipments will be well taken care of by manufacturers along the Coast line of California, particularly near Los Angeles. One of the features which the Californian manufacturers have to contend with is the fuel supply, the distance to coal being great. The Chinese and Japanese markets are on the steady increase, but are chiefly supplied from England.

SLATE PRODUCTION OF THE WORLD.
(Value at Place of Production.)

Country.	1896.	1897.	1898.	1899.*
Belgium.....	\$269,500	\$335,780	\$375,000	\$390,000
Canada.....	53,370	42,800	40,791	38,000
France.....	3,680,295	4,221,500	4,300,000	4,500,000
Germany.....	14,282	14,001	14,300	14,500
India.....	9,624	12,931	14,872	15,000
United Kingdom.....	6,691,280	8,016,939	9,235,106	9,000,000
United States.....	2,728,444	3,238,576	3,400,796	3,763,345
All other.....	30,000	44,000	50,000	60,000
Totals.....	\$13,476,765	\$15,926,527	\$17,430,865	\$17,780,845

*Estimated.

ing, 47.2 by 7.8 in., sell for 1.40 fr. (27c.) each, or less, according to size. Imports are comparatively small, and carry a customs duty of 4 fr. (77c.) per metric ton for all kinds of dressed and undressed slabs; 1.40 fr. (27c.) for roofing slate and 5 fr. (96.5c.) per metric ton for school slates and blackboards. Efforts have been made to establish a direct import trade with America instead of shipping slates through Great Britain, but apparently without success.

Germany.—The only producer is Bavaria, where the amount of roofing slate is comparatively small, reaching about \$14,500 in 1899. This country depends for its supply of slate largely upon the United States and Great Britain, as that which it produces is not of a very high grade.

India.—An improvement is noticeable in the production of slate and in four years there has been an increase of about \$6,000 in value. Nearly all the slate obtained comes from the Madras Presidency, although some metamorphic black slate has been taken also from the Bhopawar States of Central India. The slate quarried is used chiefly for flagging and for masonry structures, and a comparatively small amount has been utilized for roofing. School slates are imported from the United States and Wales.

United Kingdom.—This is the oldest and leading producer of slate in the world, the value of its output for 1899 being estimated at over \$9,000,000, an increase of about \$3,000,000 since 1896. The chief center of production is Wales, where the Bangor and Carnarvon output comes from open quarries, and the bulk of the Festiniog slate from mines or underground workings. The second in importance is England, where Cornwall, Lancashire and Devonshire are the principal producing districts. In Scotland the slate is furnished by quarries in Argyll, Perth and Aberdeen. Some slate is also produced in Ireland, at Tipperary, Cork, Wexford and Kilkenny, and on the Isle of Man. Of the entire production of the United Kingdom about 40 per cent. comes from underground workings in Wales and England. The export business has decreased in recent years owing to the aggressiveness of American quarrymen, who have cut into British territory.

THE CHEMICAL INDUSTRIES IN 1899.

The chemical industries have participated in the general activity of business in 1899, and from almost all quarters there are accounts of active production and large demand. The returns to manufacturers and stockholders, however, have not everywhere been correspondingly great; and some companies have had to report only small profits, though others have done much better.

The fact is that the chemical industry is in a state of transition. The older processes are engaged in a struggle for life with the newer electrolytic methods of manufacture, and the struggle is hardly a doubtful one, though it may last for a long time. On the other hand, the electrolytic processes are by no means perfected as yet; and the investment of capital in them is always subject to the risk that costly changes may be necessary before long. The present competition keeps down prices and profits and will tend to do so for some time to come.

As long as this period of transition lasts, and as long as chemists and electricians continue to make new discoveries, the profits in the manufacture of chemicals must be moderate only. It is true that every year the cost of making heavy chemicals is reduced, but to take advantage of this new capital expenditures are required.

Apart from these limitations the year just closed was a good one, and demand for the products of the chemical industry has been unprecedented. The manufacture is growing in the United States, and several large new plants were erected during the year.

The Alkali and Chlorine Industries in 1899.

By J. R. Watson and Alfred T. Weightman.

Considerable activity has been shown during 1899. These industries and all lines have been generally improved since 1898. English ammonia soda has partially recovered from the set-backs experienced during the two preceding years, having created other markets to take up the quantities displaced owing to domestic manufacture and increased

Chemical Markets in 1899.

The year 1899 showed a marked improvement over preceding years; prices generally have been higher and there has been an appreciable increase in the home production. New departures in the past year included the combination or centralization of fertilizer manufactures in the North and South, large phosphate mines in Florida and South Carolina, and acid makers in the East. In the alkali industry, some Pittsburgh glass people intend to manufacture their own soda ash. New by-product coke ovens have also been fired and our manufacture of sulphate of ammonia is increasing. The incorporation of many new chemical manufacturing companies, the enlargement of comparatively new plants, especially in the middle West, and the better understanding among eastern acid makers all point to a satisfactory year in 1900.

Alkali.—Demand was much improved over last year, exceeding the supply at various times. The domestic article greatly increased its consumption to the detriment of foreign makers. The imports into the United States in 1899 are estimated at 18,750 long tons, showing a falling off of 11,596 tons as compared with 1898.

Prices grew firmer and higher as the year advanced. In January, domestic high-test alkali brought 55 to 60c. per 100 lbs., in bags, f. o. b. works, and the foreign 70 to 75c. per 100 lbs. in New York. In March spot stocks were small enough to warrant an advance to 60 to 65c. for domestic and 80 to 85c. for foreign, of which large deliveries were being made. In April domestic alkali over next fire was sold at 62½ to 65c., and later quotations were 65 to 70c., while the foreign brought from 75 to 85c. During the month labor troubles in the glass regions lessened contract deliveries. In May, however, a good demand sprung up, and while makers were well sold out, jobbers manifested much activity, booking orders at 72½ to 75c. per 100 lbs. f. o. b. domestic works, and later asked 85 to 90c. In June, domestic makers quoted 62½ to 65c. per 100 lbs. f. o. b. works, for future shipments, while importers held at 75 to 80c. per 100 lbs. in New York. In July the imports were the smallest of the year, being 1,515,143 lbs. The month opened quietly owing to the blowing out of the fires at the glass works. Domestic was quoted at 67½ to 70c. in bags, f. o. b. works, while foreign was held in New York at 80 to 85c. In August the imports gained in anticipation of an improved demand. Future delivery orders were in the market, especially for the domestic article, of which large sales were made at 72½c. f. o. b. works, while for prompt shipment second hands asked up to 95c. in New York. The foreign article was unchanged at 80 to 85c. In September imports were less. Sales of foreign were reported at 77½ to 80c. for future delivery, while some domestic high-test contracts for 1900 and 1901 were taken at 75c. f. o. b. works, and others at 70 to 72½c. In October, domestic makers were about sold up for this year and were quoting only on future contracts at 77½ to 82½c. f. o. b. works, while importers were taking orders at 80 to 85c. in New York. Second hands sold domestic high-test for prompt shipment at 90c. per 100 lbs. f. o. b. works and some small sales of foreign high-test were made ex-dock at 87½ to 95c. At the end of the month domestic was so scarce that makers raised their quotations to 80 to 85c. f. o. b. works on what little they had to offer, while second hands asked all sorts of prices. The foreign article was also advanced to 95 to \$1.05 in New York. November opened with contracts for 1900 being taken at 80 to 85c. per 100 lbs. f. o. b. works, while second hands sold immediate shipments at \$1.10 in New York. The foreign remained at 95c. to \$1.05 here. Later sales of domestic from second hands were reported at \$1.12½. Makers continued to book contracts at 80 to 85c. f. o. b. works, and foreign was unchanged. In December sales were made at \$1.05 for spot foreign and at 85c. for domestic f. o. b. works.

Caustic Soda.—Business has been considerably better than in 1898, especially in the domestic article, while importations of foreign makes show a marked decrease. The imports into the United States in 1899 were approximately 6,697 long tons, showing a falling off of 4,455 tons as compared with 1898. The consumption of foreign in 1899 is estimated at 6,758 tons, which is 3,862 tons less than last year. Prices were best in the last half of the year. In January, domestic high-test caustic soda sold at \$1.40 to \$1.45 per 100 lbs. f. o. b. works—about the same as last year—while the foreign brought \$1.60 to \$1.70 per 100 lbs. in New York, against \$1.80 to \$1.95 in 1898. During the next two months a good demand sprung up, and by the end of March domestic makers were nearly sold up to July. In March our producers sold for immediate delivery at \$1.50 to \$1.70 per 100 lbs. f. o. b. works, and importers asked \$1.75 to \$2. For future shipments quotations were \$1.35 to \$1.40 for domestic and \$1.60 to \$1.70 for foreign. In April inquiries began to come forward for 1900 delivery, but sellers were not anxious to book at the then quotations, \$1.37½ to \$1.42½ per 100 lbs. f. o. b. works, and \$1.60 to \$1.70 for foreign in New York. In May some orders for 1900 were booked by domestic makers at \$1.40 to \$1.42½ per 100 lbs. f. o. b. works. In June domestic was quoted at \$1.42½ to \$1.45 and foreign was unchanged at \$1.60 to \$1.70. Powdered domestic 98 per cent. caustic soda was quoted at \$2.75 to \$3 per 100 lbs. f. o. b. works throughout the six months, which compares with \$3.12½ to \$3.50 last year. In July the imports fell to 805,251 lbs. Domestic was scarce on spot, while next year's contracts were being booked at \$1.45 per 100 lbs. for high-test, f. o. b. works, and immediate shipment orders were quoted at \$1.55 to \$1.65 f. o. b. works, and the foreign at \$1.60 to \$1.70 in New York. The domestic article was short in supply for early shipment. Contracts for 1900 were booked at \$1.55 f. o. b. works. In September, on 1900 and 1901 contracts, domestic high-test was booked at \$1.60 f. o. b. works, and later sold at \$1.65 to \$1.70 f. o. b. works. The foreign article was moved up to \$1.70 to \$1.75. In October the market was strong, domestic being advanced by first hands to \$1.77½ to \$1.82½ f. o. b. works, and by second hands, who had practically all the available caustic soda for early shipment under control, to \$1.90 f. o. b. Some makers were said to have booked contracts for future delivery at \$1.80 to \$1.85 f. o. b. works. The foreign article was also firmly held and was quoted nominal at \$1.85 to \$1.95 in New York, according to quantity and seller. The imports into the United States in the 10 months ending October 31st amounted to 11,800,073 lbs., showing

a decrease of 9,265,177 lbs. as compared with the corresponding period last year. November showed a further improvement, sales of domestic high-test being made up to \$1.95 f. o. b. works and of foreign at \$1.95 to \$2 in New York. At the close, next year's contracts for domestic high test were booked at \$1.85 to \$2 f. o. b. works, while the foreign was advanced to \$2.35 to \$2.40. Powdered caustic soda was equally firm during the past 5 months and advanced to \$2.50 to \$2.62½ for 60 to 74 per cent., and \$3.12½ to \$3.50 for 98 per cent.

Sal Soda.—The increased home production and heavier imports of the British article has aroused much competition, but the better demand has prevented any great demoralization in prices. The imports into the United States in 1899 were approximately 2,605 long tons, which compares with 2,272 tons last year. The estimated consumption of foreign sal soda in 1899 totaled 2,598 long tons, or 326 tons more than 1898. In January domestic sal soda sold at 50c. per 100 lbs. f. o. b. works and the English at 60 to 62½c. per 100 lbs. in New York, while domestic concentrated sal soda had buyers at \$1 to \$1.35 per 100 lbs. f. o. b. works, according to grade and quantity, and the foreign at \$1.60 to \$1.70. A good demand was noticeable for several months, and though there were some sales at a recession in these prices yet the situation remained practically unchanged. In July domestic sal soda was quoted at 70c. per 100 lbs. f. o. b. works and concentrated at \$1 to \$1.35 per 100 lbs. f. o. b. works, while foreign sal soda was quoted at 62½ to 70c. and the concentrated at \$1.60 to \$1.65 in New York. In August domestic was in such good demand that makers asked up to 90c. per 100 lbs. f. o. b. works, while importers quoted 67 to 70c. in New York. These prices did not hold, however, owing to an outbreak of another competitive war among domestic makers, which broke prices to 70c. per 100 lbs. f. o. b. works. The concentrated was unchanged. September opened with the domestic article selling at 60 to 65c., and the foreign at 65 to 67½c., while the domestic concentrated brought \$1.35 to \$1.60 and the foreign \$1.60 to \$1.65. In October importers advanced prices to 67½ to 72½c. per 100 lbs. in New York. The domestic article meantime suffered from further speculation, and by the end of the month dropped to 50 to 55c. per 100 lbs. f. o. b. works, while the concentrated ranged between \$1.25 to \$1.75 per 100 lbs. f. o. b. works. November opened at 65 to 70c. in New York, with the domestic article selling at 60 to 70c. f. o. b. works, and December closed with domestic quoted 60 to 70c., and foreign, 67½c.

Bicarb. soda showed an increased consumption, while prices for domestic ordinary grades fluctuated from \$1.12½ to \$1.37½ per 100 lbs. f. o. b. works, as against \$1 to \$1.50 last year. Extra grades were quoted unchanged at \$3.25 to \$3.50 per 100 lbs. f. o. b. works, less usual discounts. Foreign sold at \$2.12½ to \$2.37½ per 100 lbs. in New York, as against \$2.25 to \$2.50 last year.

Bleaching Powder.—Buying has shown a marked improvement over 1898 and prices grew better as 1899 advanced. Little can be said about our domestic production, as makers are not quoting on the open market owing to their small output, which is quickly contracted for. The imports into the United States in 1899 approximated 52,208 long tons, as against 48,421 tons last year, showing an increase of 3,787 tons. January found prime Liverpool makes selling at \$1.50 to \$1.65 per 100 lbs. in New York, and other grades at \$1.40 to \$1.65, according to quality. Some large contracts for 1899 were booked during the month for prime Continental makes at \$1.40 to \$1.45 per 100 lbs. in New York. A report was circulated that a German manufacturer had sold 4,000 metric tons at \$18.50 per ton f. o. b. steamer, the buyer being a New York firm. A scarcity in spot goods was noticeable in February, and no prime Liverpool makes were offered under \$1.60, while other grades were obtainable in a limited way at \$1.45 to \$1.60. Early in March prime Liverpool was held at \$1.60 to \$1.70, and holders being pressed for immediate deliveries, advanced the price to \$1.80 to \$1.85, while during the same period sellers of other makes quoted from \$1.50 up to \$1.65 per 100 lbs. in New York. But by the end of March imports were to \$1.60 to \$1.65 for prime Liverpool and \$1.40 to \$1.50 for outside makes. In April prices receded still further and sales of prime Liverpool were made at \$1.50 to \$1.62½ and outside grades at \$1.30 to \$1.62½, the higher price being quoted by Continental makers of prime bleach. In May another drop to \$1.45 to \$1.50 was noted for prime Liverpool and \$1.30 to \$1.50 for other makes, owing partly to increased competition. In June Liverpool prime could be bought at as low as \$1.42½ and outside makes at \$1.25. Notwithstanding the improved demand, owing to warmer weather, prices remained unchanged at \$1.42½ to \$1.50 per 100 lbs. for prime Liverpool and \$1.25 to \$1.35 for other makes, in New York. August found only a limited supply of prime goods. In the last week of August prices were advanced to \$1.40 to \$1.50 for prime Liverpool and \$1.40 to \$1.50 for other sorts. In September the price of prime English was again advanced to \$1.60 to \$1.65 and then to \$1.65 to \$1.75, while other makes were also raised in price to \$1.50 to \$1.60. November opened with prime Liverpool selling at \$2.10 to \$2.20 to arrive and \$2.37½ to \$2.50 for spot, as the agents of the United Alkali Company were about sold up for this year. Other brands were quoted at \$1.80 to \$1.85. The month closed with prime Liverpool selling at \$3 to \$3.50 for spot—the highest price for a very long time—and contracts for 1900 were booked at \$2 to \$2.25, a gain of 50 to 85c. per 100 lbs. as compared with 1899 contracts. This increase is due to the higher cost of raw material and fuel at places of manufacture. In December the market was firm at \$2.37½ to \$2.50 for prime Liverpool and \$2.15 to \$2.25 for other sorts.

Chlorate of Potash.—With an increased production at home our imports have fallen materially. In 1899 the United States imported 724 long tons, against 2,146 tons last year, showing a decrease of 1,422 tons. Prices, as a whole, were better than last year. In January chlorate of potash, in crystals, sold at \$9½ to \$9¾ per 100 lbs. down to \$8½ to \$9, and powdered at \$9¼ to \$9½ per 100 lbs. in New York. Last year sales in January were made at \$8¾ to \$9½. At the end of April domestic sold at \$9 per 100 lbs. f. o. b. works, French at \$9 to \$9½ in New York, and English at \$9½ to \$9¾, same place. In July limited offerings by importers caused prices to advance to \$9.50 to \$9.75 for crystals and

\$10.25 to \$10.50 for powdered, while the domestic made a sympathetic move to \$9.25 to \$9.50 for crystals and \$10 to \$10.25 for powdered. In October the demand was better, but the expected dissolution of the foreign syndicate broke prices. Large orders were then booked for next year at \$8, and the open market was quoted at \$9 to \$9.25 for foreign crystals and \$9.50 to \$9.75 for powdered, and \$8 to \$8.75 for domestic crystals and \$9.25 to \$9.50 for powdered. Late in the year contracts for 1900 domestic were taken at \$8 to \$8½, while the foreign sold at \$9 to \$9.12½ for crystals and \$9.12½ to \$9.25 for powdered. Domestic makers quoted the open market at \$8.25 to \$9 for crystals and \$9.12½ to \$9.37½ for powdered.

Acids.—The consumption has improved in 1899 and prices, though competition at times was keen, were, on the whole, better than in the previous year. The formation of the General Chemical Company, with a \$25,000,000 capitalization, was instrumental in settling the differences that caused such a demoralization of prices since the recession of the old agreement known as the Knickerbocker Chemical Company. The new company includes 12 concerns, of which 4 are in New York, 3 in New Jersey, 2 in Pennsylvania and one each in Connecticut, Ohio and Illinois. The prime mover in the organization of the General Chemical Company was Mr. James L. Morgan, Jr., of the firm of James L. Morgan & Son of New York. The operations so far have been satisfactory and prices for the leading acids have been well maintained by those in the agreement.

Acetic acid, commercial No. 8, opened at \$1.30 to \$1.40 per 100 lbs., in January, and remained practically unchanged for several months. By October makers quoted \$1.62½ to \$1.75 per 100 lbs., which remained the market figures until the close of the year. At the same time last year prices were \$1.30 to \$1.35.

Muriatic acid was in good request and shows increased prices and sales over last year. In January prices were \$1.10 per 100 lbs. for 18° in drums, \$1.20 for 20° and \$1.35 for 22°. These prices are from 10 to 22½c. more per 100 lbs. than ruled in the same month in 1898. In the last half of 1899 contracts for next year's delivery were being booked at \$1.20 to \$1.50 per 100 lbs., according to strength, and these prices were virtually quoted on the open market for immediate shipment.

Nitric acid was also in better demand, and advanced in price, owing partly to the higher cost of raw material. In January 36° acid was quoted at \$3.50 per 100 lbs., in drums; 38° at \$3.75; 40° at \$4, and 42° at \$4.62½, showing an increase of 50c. per 100 lbs. over the same time in 1898. Throughout the year prices were very steady and during the last quarter contracts for 1900 delivery were being booked at \$3.87½ per 100 lbs. for 36°, in drums, \$4.12½ for 38°, \$4.37½ for 40° and \$4.75 for 42°. These were also the market quotations for immediate shipments.

Oxalic acid prices suffered from the collapse of the combine abroad, which was occasioned by severe competition with new makers on the Continent. The price in January was \$6.25 to \$6.50 per 100 lbs. In September the market softened on announcement of the competition abroad, and prices dropped to \$5.75 for contracts and \$6 for immediate delivery orders. Last year contracts were booked at \$6.50, and the spot market was quoted up to \$7 by the combination. At the close of 1899 quotations are \$5.75 to \$6 per 100 lbs. The demand is slightly better than 1898, in sympathy with the other acids.

Blue vitriol (copper sulphate) shows a considerable improvement over 1898, both in the demand and market value. The upward tendency of copper values has been responsible for the advanced price of blue vitriol. On the other hand, the export trade has grown enormously. In 1899 the United States exported, approximately, 12,014 long tons, showing an increase of 5,527 tons as compared with 1898. In January blue vitriol fluctuated between \$3.75 to \$6 per 100 lbs., closing at \$4.50, which compares with \$3.75 to \$4 in the same month of 1898. In February the exports increased. In March the exports were again increased, principally to Italy. During that month prices were firmly held at \$5.75 to \$6 per 100 lbs. by leading dealers. A yearly contract for 2,400 tons for the Western Union Telegraph Company was taken by the Consolidated Kansas City Smelting and Refining Company at between \$4 and \$5 per 100 lbs., to begin April 1st. In July the demand for export decreased noticeably. In November some of the large concerns fixed the car load price at \$5.25 per 100 lbs. and smaller orders at \$5.50, though others were understood to have shaded these prices to \$5 and less. December reflected the condition of the market in November.

Sulphuric acid was bought this year in a larger way than for several years past, and prices also appear to have been better maintained. The consumption by the fertilizer people shows a marked increase. In January the price of 66° acid was \$1.10 per 100 lbs., in drums, against \$1 in 1898, and chamber acid (50°) at \$11.50 to \$12 per ton, in bulk, f. o. b. factory, against \$7.50 to \$8. During the following 10 months prices fluctuated little. In November and December contracts were booked for 1900 delivery at \$1.20 for 66° acid, and chamber acid was advanced to \$16 to \$17 per ton, f. o. b. factory.

Liquid anhydrous sulphurous acid was in better demand and was quoted at 8 to 10c. per lb., according to quantity, delivered in New York. This acid is 100 per cent. SO₂ and has been liquified under pressure.

Brimstone.—This market was governed by advices from the Anglo-Sicilian Sulphur Company, which fixed the price abroad. The imports into the United States in 1899 amounted to about 140,000 long tons, showing a decrease of 19,700 tons from 1898. The consumption of this brimstone by acid makers and others in 1899 is estimated at 139,500 tons, or 18,876 tons less than in the previous year. This falling off in consumption was due partly to the increased use of pyrites. Of Japanese sulphur only a few cargoes were received on the Pacific Coast, at San Francisco. In Sicily the syndicate had to contend with an increased production owing to some new individual operators. Competition ensued, resulting in a demoralization of prices there. This was followed by the syndicate rescinding its contract with the refiners and millers at Catania and purchasing its refined, sublimated and ground sulphur from outsiders who marketed their goods at that place. This step was taken to maintain the syndicate's market prices. In January prices fluctuated fractionally for spot, best unmixed seconds, at \$21½ to \$22 to \$21¼

to \$21½ per ton, while thirds were from \$1 to \$2 less per ton. In the fiscal year ending June 30th, 1899, the total shipments from Sicily to all countries amounted to 428,023 long tons, as against 401,909 tons in 1897-'98. Of this total the United States received 63,048 tons less than in 1897-'98, while nearly all the other countries showed increased receipts. Stocks on hand in Sicily on July 1st were 185,269 tons, being 56,468 tons more than at the corresponding period last year. Prices in New York opened in July at \$22 for spot seconds, but soon the market weakened to \$21¼ to \$22½, closing at \$21.75 to \$22, and shipments at \$20.50 to \$20.75, with thirds \$1.75 to \$2 less per ton. In October the stronger market abroad was reflected in New York, spot best unmixed seconds being quoted at \$22 to \$22.50 and shipments at \$21 to \$21.75, with thirds about \$2 less. The total shipments to the United States in the 10 months ending with October were 123,071 tons, as against 142,587 tons in the same time last year, showing a decrease of 19,516 tons. November opened firm at \$22 for spot best unmixed seconds, \$21.50 for shipments, and \$2 less for thirds, closing easier at \$21.50 for spot seconds, \$20.50 to \$20.75 for shipments and \$2 less for thirds.

Pyrites.—Consumption shows a material increase over last year. Our own mines have enlarged their output and the imports of Spanish ore are considerably above 1898. The acid makers have purchased much the larger part of the supply of pyrites and as their deliveries were mainly on contract, the market prices showed little variation. The imports into the United States in 1899 approximated 287,000 long tons, showing an increase of about 115,000 tons as compared with 1898. These were Spanish pyrites, containing from 46 to 51 per cent. sulphur. The freight rate from Huelva was about \$2.80 per ton. The American pyrites contain from 42 to 44 per cent. sulphur and the Pilley's Island, Newfoundland, 50 per cent. Quotations for the American were, for lump ore, \$3.25 to \$4.50 per long ton, f. o. b. mines, Mineral City, Va., and \$5 f. o. b. Charlemont, Mass., while Pilley's Island was \$6.50, delivered in New York. Fines were quoted \$3 to \$4.20 per long ton f. o. b. Mineral City, \$4.25 f. o. b. Charlemont, and \$4.50 for Pilley's Island delivered in New York. New pyrites-burning plants were talked of by our domestic producers for pulp manufacturers, and experiments in this direction continue to be made.

Fertilizing Chemicals.—The year just closed has realized better profits to the manufacturer than its predecessor, notwithstanding the increased cost of raw material. The trade has been kept well in hand by the two largest combinations—the American Agricultural Chemical Company in the North and the Virginia-Carolina Chemical Company in the South. A good export business has been built up in the leading ammoniates, while our home consumption has also improved. The outlook for the year 1900 is for higher prices, as the cost of manufacturing fertilizers will likely be from \$1.50 to \$2.50 per ton over 1899, owing to the upward movement of raw material. A number of new plants have been erected during the year, while the producing capacity of older works has been enlarged.

Potash salts were in good request and contracts were booked at schedule rates as established by the agents of the German Kali Syndicate. The year closes with the following prices quoted at New York: Muriate of potash, 80 to 85 per cent., \$1.78 per 100 lbs., and 95 per cent., \$1.81; sulphate of potash, 90 per cent., \$1.98½, and 96 per cent., \$2.10½; double manure salts, 48 to 53 per cent., 66c. per 100 lbs., and 30 per cent., 89c.; kainit, \$8.70 to \$8.95 per long ton; sylvanite, 37 to 38c. per unit. These prices are on the basis of foreign invoice weights, tares and analysis, in quantities of not less than 500 tons bulk salts, or 50 tons concentrated salts. In the 10 months ending October 31st the imports of muriate of potash into the United States amounted to 79,988,177 lbs., against 70,845,763 lbs. last year. Of this amount we re-exported 102,432 lbs., against 128,300 lbs. in 1898. The apparent consumption in the 10 months was, therefore, considerably more than last year.

Sulphate of ammonia gas liquor was very active and prices were the highest in a long time past. The consumption has steadily increased and the domestic production was enlarged by the operation of several new by-product coke oven plants. In January deliveries were made at \$2.70 to \$2.77½ per 100 lbs. for 24 to 25 per cent. liquor, an advance of 22 to 38c. per 100 lbs. over the same month in 1898. Bone sulphate of ammonia was quoted at \$2.60 to \$2.65, against \$2.25 to \$2.45 per 100 lbs. in January, 1898. The shipments from Great Britain to this country in the eleven months ending November 30th were approximately 6,874 long tons, showing an increase over last year. In December quotations were \$2.92½ for spot gas and \$2.90 for shipments, while bone was held at \$2.77½ to \$2.80.

The other ammoniates were quoted as follows: Western high-grade dried blood, \$1.77½ to \$1.95 per unit, in January, \$1.85 in June, and \$1.70 to \$1.75 in November, while New York blood was \$1.65 to \$1.72½, \$1.85 to \$1.90 and \$1.80 to \$1.85 per unit, respectively. Azotone, \$1.70 to \$1.75 per unit, in January, \$1.85 to \$1.95 in June, and \$1.75 to \$1.80 in November. Dissolved bone black, 17 to 18 per cent. P₂O₅, \$16 to \$16.50 per ton in January, June and November. Acid fish scrap, \$11 to \$11.50 per ton, f. o. b. works, in January and June, and \$10½ to \$11 in November, while dried was quoted at \$19.50 to \$20 f. o. b. factory. Tankage high-grade western, \$14.50 to \$15 per ton f. o. b. Chicago, in January, \$17 to \$17½ in June, and \$14½ to \$15 in November. Concentrated tankage, \$1.45 to \$1.50 per unit f. o. b. Chicago, in January, \$1.60 to \$1.65 in June, and \$1.45 to \$1.50 in November. Bone tankage, \$19½ to \$20½ in January and \$20 to \$21 in June and November. Ground bone, \$24 to \$24.50 per ton, delivered in January, \$23½ to \$25 in June, and \$22 to \$23 in November. Concentrated phosphates, 30 per cent. available phosphoric acid, 57½ to 60c. per unit. Acid phosphates, 13 to 15 per cent. average P₂O₅, 60 to 65c. per unit at sellers' works, in bulk. Ammonia superphosphates, high grade, \$25 to \$26 per ton.

Nitrate of Soda.—The speculative element has not been active, hence the market has been more stable, and with a pretty fair understanding between the oficinas on the Coast, production has been kept well in hand and consumption has been increased. During the year the United States imported, approximately, 136,142 long tons, against 147,494 tons in 1898, and 94,965 tons in 1897. The consumption in 1899 is estimated

at 134,000 tons, showing a decrease of 12,759 tons as compared with 1898, but an increase of 39,938 tons over 1897.

The New York selling price in January was \$1.60 to \$1.57½ per 100 lbs. for spot supplies and \$1.57½ to \$1.52½ for futures. Later in the year freight room became scarcer and by the end of November importers quoted \$1.70 to \$1.75 for spot and nearby shipments, and some orders had been taken at \$1.62½ to \$1.65 for future delivery, while in December spot was quoted \$1.80@1.85, and future, \$1.65@1.75.

Phosphates.—This has been an exceedingly good year, production has been enlarged by the opening of new deposits, consumption increased by superphosphate works, and prices have gone up materially. The total production in the United States in 1899 was 1,738,372 long tons, showing an increase of 480,727 tons, as compared with 1898.

Florida high-grade rock (78 to 80 per cent.) was in most demand for export. In January quotations were \$8.50 to \$9 per long ton, f. o. b. Fernandina, and \$13.13 to \$13.83 c. i. f. United Kingdom or North Sea ports. February prices were \$9 to \$10 f. o. b. and \$13.62 to \$13.83 on the other side. In March prices were variously quoted at \$9 to \$11 f. o. b. Fernandina and abroad at \$14.22 to \$14.42. In April prices were firm at \$9.50 to \$10 f. o. b., and \$14.62 to \$15 c. i. f. United Kingdom or North Sea ports. In May the foreign market was higher, at \$15 to \$15.80. In September the exports were less, and f. o. b. Fernandina prices were \$9.50 to \$10, and abroad \$13.65 c. i. f. United Kingdom or North Sea ports. In October prices were \$9.50 to \$10 f. o. b. and \$14.04 to \$13.38 abroad. In November the foreign market was easier, as consumers had either sufficient stock on hand or had placed orders which were being filled. The f. o. b. prices remained at \$9.50 to \$10, while \$13.83 to \$14 was quoted abroad. In December producers were asking \$10 f. o. b.

UNITED STATES PHOSPHATE EXPORTS IN 1899.
(In long tons of 2240 lbs.)

Month.	Florida High Grade Rock.	Fla. Pebble: Tenn.; So. Car. Rock.	Total.	
			Quantity.	Value.
January.....	28,460	25,756	54,216	\$356,773
February.....	32,630	18,793	51,423	408,970
March.....	43,051	30,424	73,475	595,123
April.....	59,001	32,137	91,138	738,396
May.....	47,078	51,557	98,635	782,545
June.....	23,051	34,046	57,097	446,181
July.....	48,747	52,452	101,199	785,389
August.....	41,155	43,934	85,089	665,965
September.....	35,728	33,392	69,120	535,348
October.....	36,694	39,759	76,453	616,355
November.....	33,000	35,000	68,000	588,200
December.....	30,000	25,000	55,000	475,500
Total.....	458,595	422,250	880,845	\$6,994,345
Total, 1898.....	358,569	222,379	580,948	4,672,463

Fernandina, and abroad \$13.65 to \$14 was quoted. The miners are well filled with orders for the coming year and it is expected that some operators will seek higher prices in 1900, though \$10 f. o. b. Fernandina is considered a good market price. In the land pebble and Peace River rock regions operations have been well controlled, as the large miners have taken hold of many of the smaller properties. In January land pebble (68 to 73 per cent.) brought \$5½ to \$6 per ton, delivered in New York, and since April \$7 to \$7.50 ruled, while Peace River rock (58 to 63 per cent.) sold up to \$4.50 per ton f. o. b. Punta Gorda. Abroad land pebble was in better demand than Peace River stuff, selling at \$10.15 to \$11.20 per ton, c. i. f. United Kingdom or North Sea ports, as against \$8.40 to \$9 for Peace River, same delivery. In the 10 months ending October 31st the foreign shipments of pebble phosphate were approximately 114,000 tons, while the domestic movement amounted to only 72,000 tons. This phosphate competes in the foreign market with the Algerian. For the 63 to 70 per cent. Algerian phosphate quotations were \$9.24 to \$9.90 per ton, c. i. f. United Kingdom or North Sea ports, while the 58 to 63 per cent. brought \$8.10 to \$8.40, same delivery. The total production of all phosphates in Florida in 1899 was 796,591 long tons, or 249,710 tons greater than last year.

Tennessee rock showed an increased demand and higher prices. Phosphate land in this State has gone away up in value owing to some new and valuable discoveries. In January 75 to 80 per cent. rock sold at \$2 to \$2.30 per ton, f. o. b. Mt. Pleasant, and low-grade stuff (65 per cent.) at \$1.75. Abroad, high-grade rock was quoted at \$11.31 per ton, c. i. f. United Kingdom or North Sea ports. Later low-grade rock f. o. b. mines was \$2.25 to \$2.50. In the year 1899 the production was approximately, 425,500 long tons, or 153,309 tons more than 1898. Up to the close of 1899 export high-grade rock fluctuated fractionally between \$3.80 to \$4.50, f. o. b. Mt. Pleasant, while domestic was worth \$2.50 to \$2.75 f. o. b. mines. The foreign market, after touching \$12.48, c. i. f., for high-grade rock, receded to \$11.31 in November, and in December closed at \$11.95. South Carolina rock was also in good request, the shipments from Charleston and Beaufort in the fiscal year ending September 1st amounting to 481,076 tons. Of this total 87,870 tons were exported and 393,206 tons were domestic. Crude rock sold in January-March at \$5.50 to \$5.75 per short ton, in New York, from April to June at \$6, and later at \$4.25 to \$4.50 f. o. b. Fetteressa, while abroad sales were made c. i. f. United Kingdom or North Sea ports at about \$6 per ton. Dried rock was variously quoted at \$3 to \$3.25 per long ton, f. o. b. Ashley River, and \$4.25 to \$4.50 and \$4.50 to \$5 f. o. b. Fetteressa. The exports from the United States were as below. The freight market showed some wide fluctuations. Rates from southern ports to the United Kingdom, Baltic, Continental and Mediterranean ports ranged from 15s. to 26s. (\$3.60 to \$6.24).

North Carolina phosphates show an increased demand locally, and in the fiscal year ended September 1st the shipments amounted to 13,750 tons, as against 12,500 tons in 1897-'98.

It may be noted that the imports of phosphates (principally from Belgium) into the United States in 1899 amounted, in round numbers, to 103,000 tons, valued at \$457,000, which compares with 66,129 tons, valued at \$303,635, in 1898. These phosphates are used chiefly as a filler in the manufacture of commercial fertilizers.

THE MINING STOCK EXCHANGES IN 1899.

Letters from the different stock markets which we publish below show that the increase in prosperity in the United States in 1899 was accompanied by a greatly increased interest in mining and industrial shares.

The New York Mining Stock Market in 1899.

This has been quite an active year for speculation and the flotation of new enterprises, principally zinc and copper, while in 1898 the gold properties were most in evidence. The advances in the metal market furnished an opportunity for mining company promoters, and it is needless to say that a number of their schemes were rank wild cats. Unfortunately, investors in these frauds are now heavily burdened with stock which can best be sold to a junk dealer. Of course there were many good and promising properties placed on the market, and of these some of the larger zinc companies are paying regular dividends.

A feature was the incorporation, in April, of the Amalgamated Copper Company, with a capitalization of \$75,000,000. This company controls property in Montana, including the Anaconda Copper Company, which was formerly controlled by the Exploration Company of London. The Amalgamated Copper Company was organized principally by people identified with the Standard Oil Company, and it appears that the former will be managed as secretly as the latter, for the benefit of the insiders. The Amalgamated Copper Company is mostly interested in Montana properties, but to just what extent is not certain.

Another feature is the flotation of the Stratton's Independence, Limited, of Cripple Creek, Colo. The Venture Corporation, Limited, of London, obtained control of this property from Mr. W. S. Stratton early in the year, and in his agreement he stipulated that 100,000 shares of the 1,100,000-share capital (par £5) shall be offered to the American public. This amount was placed on the New York market in September at \$12.50 per share, and was subsequently subscribed for. Two dividends of 2s. each were paid by the company on September 25th and December 12th, amounting in all to \$976,000. The stock is now being dealt in on the London Exchange.

The Tennessee Copper Company, with property near Ducktown, Tenn., is controlled by Lewisohn Brothers of New York, who incorporated it in April with a capital of \$5,000,000.

The Union Copper Mining Company, near Salisbury, North Carolina, also controlled by a few people, has a capitalization of \$2,500,000.

The Basin Gold and Copper Mining Company, with a capital of \$2,500,000, was incorporated to work the old Hope Mine in Jefferson County, Montana. The stock was subscribed for at \$2.50 per share, while the par value was \$5.

One of the most important deals was the formation, in March, of the American Smelting and Refining Company—the silver-lead smelter combination. This agreement had been pending for a long time. The company includes 12 concerns—Bi-Metallic, Chicago & Aurora, Colorado, Consolidated Kansas City, Germania, Globe, Hanauer, Omaha & Grant, Pennsylvania Lead, Pennsylvania Smelting, Pueblo and the United Smelting and Refining Company. The total capitalization is \$65,000,000, divided into \$100 shares, of which \$32,500,000 is 7 per cent. cumulative preferred stock and \$32,500,000 common.

There have been a number of other new companies, but their stock has been mostly subscribed for in Boston.

Speculation was best in the middle of the year, when general business prosperity was at its highest.

Amalgamated Copper was heavily subscribed for at \$100, and on the curb in May the price rose to \$125, but owing to disappointment of speculators who had expected to reap large profits the stock collapsed to \$94 on pressure to sell at the close of that month. In June the shares took another tumble to \$85, but subsequently recovered to \$96, and later in July to \$100. In August the stock sold at \$95¼ to \$98½. In September a dividend was talked of, but being officially denied, the stock fell to \$91¼ and later recovered to \$97½. In October, however, a 2 per cent. dividend was actually declared, and notwithstanding the denial of the report that the National City Bank had declined to allow over 60 per cent. of the market value of the stock as collateral, the price fell from \$92½ to \$84¼—the lowest up to that time. In November sales were made at \$84¼ to \$88, and in December down to \$77. In the latter month another 2 per cent. dividend was declared.

Anaconda Copper of Montana was added to the unlisted department of the New York Stock Exchange in March, and at that time sold at \$42½ to \$48. In April it rose from \$46 to \$65, and after selling down to \$53 on discussion as to the amount of the forthcoming dividend, recovered to \$68½, when the regular quarterly dividend of \$1.25 was declared. In June sales were made as low as \$49¼ and up to \$53. In July transactions took place at \$57½ to \$53¼, and in August at \$55½ to \$58¼. In September sales were made at \$56 down to \$50¼, and singularly enough, in October, when the \$2 dividend for November 1st was declared, the stock again tumbled from \$50 to \$41. This was attributed to the weakness in Amalgamated Copper. In November a slight recovery was noted at \$45 to \$47½, but the announcement in "The Engineering and Mining Journal" that the company would discontinue its annual reports practically influenced trading in the stock. Consequently, for several days, early in December, absolutely nothing was done in the stock. Later, sales were made as low as \$31½.

Tennessee Copper was traded in entirely on the curb, where the sales were comparatively small, owing to the unwillingness of the few insiders to dispose of their holdings. In April sales were made at \$25 to \$30½, and in May at \$26½ down to \$19. In June to August tradings were made at \$19 to \$21¼, and in September the price dropped to \$16 after selling at \$20½. In October \$15 was bid and \$17 asked, and in November \$1 less was quoted. In December quotations were \$10 to \$12.

Union Copper of North Carolina was only dealt in on the curb. The quotations in August were \$25 bid and \$27 asked, and in September sales were made at \$36 to \$38, and in November at \$25.

The American Smelting and Refining securities were in good request. The dealings in March were on curb, when the common stock brought \$45 to \$42½; preferred was quoted \$87 to \$85, and subscriptions at \$114

to \$117½. In April these securities were listed on the New York Stock Exchange, where sales were made at \$55½ to \$59 for the common shares, \$90 to \$94 for the preferred, and \$120 to \$121½ for subscriptions. When the certificates to the stock were issued these subscriptions were dropped. In May the common shares went down to \$35½ from \$52, and the preferred to \$80 from \$90. In June sales of common were made at \$36 to \$42, and of preferred at \$81½ to \$85½. In July the prices were \$35½ to \$38 and \$81½ to \$85. August showed a better feeling at \$41 to \$45½ for the common stock and \$88½ to \$92½. Shortly after the quarterly dividend of 1½ per cent. was declared on the preferred stock, payable in September, those shares ruled lower at \$37 to \$91½, and for the common stock, \$36½ to \$43½. In October and November sales of the common stock were made at \$35 to \$40½, and of the preferred at \$86 to \$91½, the higher prices being received in the latter

was obtained, but in July the price fell to \$7½, recovering in August to \$8½ to \$9½ on sales, and in October again touching \$7½ to \$8½. In November transactions were booked at \$8 to \$8½, and in December, when a 10c. dividend—the first since November, 1897, when a clean-up dividend of 75c. was paid—the stock sold at \$3.75. Horn Silver ruled quiet, and after selling at \$1.55 in February, receded to \$1.40 in March, when a 5c. dividend was paid. In April up to \$1.44 was paid for the stock, and in May the price rose to \$1.75. In June it receded to \$1.60 to \$1.55, and thereafter sales were booked at \$1.25 to \$1.35.

Alice of Montana had its best time early in the year, when it sold up to \$2.25, in May. In August the price dropped to \$1.05 on small sales, and in October and November it fell again to 65 to 51c., the lower price being paid in November. Moulton, which paid its first dividend in five years in February—5c. per share—sold at 25c., and later at 35c.

FLUCTUATIONS IN THE PRICES OF STOCKS AT NEW YORK DURING 1899.

Table with columns for Name and Location of Company, Par Value, and monthly price fluctuations (January to December) for various stocks. Includes entries like Acacia, g. Colo., Adams Con., Colo., Alamo, g. Colo., etc., and a Total sales row at the bottom.

C., copper; g., gold; l., iron; l. lead; q., quicksilver; s., silver.

month. In December sales were made down to \$30 for the common shares and \$79 for the preferred, but at the close prices are stronger. Another quarterly dividend of 1½ per cent. was declared on the preferred.

Homestake of South Dakota was much higher than last year. After selling at \$60 in January, it sold up to \$75 in July, when the company's capitalization was increased to \$21,000,000 from \$12,500,000, for the purpose of controlling the Highland Mining Company, Black Hills Canal and Water Company and the Black Hills & Fort Pierre Railroad. In August a sale was made at \$72, and in November further transactions were recorded at \$75 to \$76. The company pays two dividends of 25c. each, regularly every month, and this distribution has induced many to hold their stock. Deadwood Terra showed fair dealing at 60 to 85c., the higher price being realized since July.

Ontario of Utah has put on new life. In February the shares were quoted at \$5.75, and in May a sale was made at \$8. A month later \$9½

In the California section higher prices have ruled. Standard Consolidated opened at \$2.25, sold in February at \$2 to \$3, when its capitalization was reduced from \$20,000,000 to \$2,000,000, fell in April to \$2.25 to \$2.50, and on declaration of a 10c. dividend in May recovered to \$2.75. In June, however, it fell to \$2.25, but in September sold up to \$3.25, and in October, before the 10c. November dividend was declared, it brought \$2.90 to \$2.85. Brunswick Consolidated, which it is the intention of some stockholders to put under the same management as the Standard Consolidated, sold in January at 20c., and in February at 30 to 33c., but receded again to 20c. in April and 18c. in July. In September the stock recovered to 29c., selling in October at 30c., but with the announcement of a 3c. assessment the price fell to 24c. In November, Syndicate reduced its capital stock in May from \$10,000,000 to \$100,000, at \$1, owing to the war tax. In February it sold at 10c., and by July receded to 7c. The upward tendency of the quicksilver market influenced trading in the Quicksilver Mining Company. The common stock sold

in February at \$1.25 on 'Change and \$1.90 at auction, while the preferred was quoted at \$5. In March the common shares sold at \$2.75 to \$3.50 and the preferred at \$9.50. In April common brought \$2.50 to \$3.50 and preferred \$9 to \$11, owing to the declaration of a 50c. dividend on the latter shares, payable in May—the first since June, 1891, when \$1.25 was paid. In June common sold at \$1.90, and later at \$2, while the preferred shares changed hands at \$10 in July. In December quotations were \$2 for the common and \$7½ for the preferred.

The Colorado stocks were active, especially those in the Cripple Creek Group, which were influenced by an increasing gold production and continued dividends. In this section Portland, which pays a regular monthly dividend of 2c. per share, sold from \$1.40 to \$1.75 in January to \$2.45 in November, while in December it was held at \$2.35. Isabella has been lively owing to the discovery of new rich pockets. In January the stock jumped from 38c. to \$1.75; in February, when a 6c. dividend was declared—the first since June, 1897, when ½ was paid—it sold at \$1.38 to \$1.25, and at \$1.15 ex-dividend. In March the stock receded to 87½ to 80c., recovering to \$1.10 in April, but in July sold down to 79 to 75c. In September a quarterly dividend of 1c. was distributed, and the stock went to 95c. In October another rich uncovering in the property sent the stock up to \$1.30, while in November it ruled at \$1.25 to \$1.45. In December a 3c. dividend was declared and sales were made at \$1.40. Elkton Consolidated sold at \$1.12 to \$1 in February, and in March at \$1.02½ to 80c., and thereafter at 95 to 85c. In September \$1.10 was obtained when a 3c. dividend was declared—the first since November, 1898, when 1½c. was paid. Further sales were made in October-December at \$1.15 to \$1.10. Anchoria Leland brought 98c. in March, and after paying a 3c. dividend in April and selling at 92½ to 95c., dropped to 70 to 75c. in September. Anaconda Gold fluctuated between 60c. in February and 43c. in October. Mt. Rosa at 21c. in June to 50c. in December, when a 4c. dividend was paid from the sale of property and Work at 19c. in July and 34c. in October. Argentum-Juniata sold at 26c. to 21c. Acacia brought 44c. in November. Pharmacist was reorganized in Oc-

Kingston & Pembroke of Ontario has received more attention, and sales were made from 50c. in October to 90c. in November, owing to the improved demand for the iron ore from this property. In December, however, the price dropped on sales to 35c. Phoenix Consolidated of Arizona has been supported by New York people, and sales of the stock were made from 9 to 16c.

British Columbia Copper of British Columbia is a new company, the par value of its shares being \$10, and these were traded in on the curb at \$10½ to \$15 in April to \$10½ in November, and in December were quoted down to \$9. This concern is also controlled largely by New York people.

A number of new Arizona properties have been called on the curb, and among these the Markeen was sold at \$6.50 in February to \$11½ in October, and Arizona Lead at \$7½ to \$10½.

There were also auction sales of a number of stocks not dealt in on the regular board here, and among these were: Appalachian Steel and Iron Company of Virginia, \$25,000 first mortgage 6 per cent. bonds at \$300 for the lot; Avondale Marble Company, \$6,000 5 per cent. gold bonds at \$680 per bond, and \$51,000 at \$279 per bond; Beatrice Hydraulic Cement Company, 20 shares at \$10 for lot; Batopilas Mining Company of Mexico, 620 shares at \$1, 1,002 shares at 96c., and \$10,000 first mortgage 6 per cent. bonds at 46; Bonanza Development Company of Colorado (par \$10), 1,000 shares at \$2.25 per share; Big Muddy Coal and Iron Company, 20 preferred shares at \$105 for lot, and \$1,500 first mortgage 6 per cent. bonds at 78½; Clearfield Bituminous Coal Company, \$6,000 first mortgage 4 per cent. bonds at 95½; Compromise Mining Company, 5 shares at \$15.05 per share; Consolidation Coal Company of Maryland, 100 shares at \$58; Edison Ore Milling Company, 22½ shares at \$10 per share; Germania Petroleum Company, 2,000 shares at \$6; Glen Ridge Quarry and Mining Company, 40 shares at \$5 per share; Helena & Livingston Smelting and Reduction Company, 1,000 shares common (par \$5) at 17c. per share; Harvey Steel Company, 59 shares at \$145; Issaquah Coal Company of Seattle, Wash., 100 shares at 18c.;

PRICES OF INDUSTRIAL AND COAL STOCKS AT NEW YORK AND PHILADELPHIA DURING 1899.

Table with columns for Name of Company, Par Value, and months January through December, with sub-columns for High (H.) and Low (L.) prices. Includes a 'Sales' column on the far right.

tober as the Pharmacist Consolidated Gold Mining Company, the old stockholders receiving one share of the new for two for the old shares. The old shares sold at 6 to 7c., and the new at 14c. Breece of Leadville sold up to \$1.38 to \$1.50 in February, when a 5c. dividend was paid. In March and April sales were made up to \$1.80, and in July at \$2.10. In August transactions were booked at \$1.75 after the 5c. dividend for September was declared. In September a further drop to \$1.50 was noted as a result of the efforts of some insiders to reduce the capitalization from \$5,000,000 to \$3,500,000 and increase the number of shares to 700,000 at \$5 instead of 200,000 shares at \$25 each. Iron Silver showed fair dealings, but declined from 82c. in February to 50c. in December. Small Hopes, upon payment of a 10c. dividend in February, rose to \$1.40, but receded thereafter until September, when the price was \$1.25 on sales. Golden Fleece, after selling at 43½c. in February, brought only 24c. in October, but recovered in November to 30 to 32c. Little Chief reduced its capitalization in August from \$10,000,000 to \$200,000. Sales of the stock were few at 17 to 20c.

In the Comstock group the formation of the Comstock Pumping Association and subsequently a plan for furnishing cheaper power for unwatering the lower levels, with an occasional find in the properties, aroused a little interest in these shares. On the other hand, the continued assessments rather dampened speculation. Consolidated California & Virginia sold at \$2.30 in April and at \$1.25 in July; Ophir at \$1.40 in February and April, and 85c. in June; Sierra Nevada at \$1.50 in February and 37c. in December.

Joseph Ladue Gold Mining and Development Company of Yukon, 5 preferred shares at \$7 per share, 50 shares at \$6.25, 200 shares at \$4.75, and 100 shares same at \$1.50; Jefferson & Clearfield Coal and Iron Company, 40 shares preferred at \$70½; Kansas City Humboldt Mining Company, 500 shares at \$50 for lot; Mechanical Gold Extractor Company, 100 shares at \$19 for lot; Mahoning Coal Railroad Company, 2 preferred shares at \$131 and 201 common shares at \$175½ @ \$1.80½; Mount Albert Gold Mining and Power Company, 1,000 shares at \$60; Morning Star Consolidated Mining Company, 284 shares at 20½c. per share; New Jersey Zinc Company, 23 shares at \$157, 9 shares at \$136, 213 shares at \$157½, and 60 shares at \$130; National Nickel Company, 1,000 shares at 7c. per share; New York & Shawnee Coal Company, \$25,000 first mortgage 6 per cent. sinking fund bonds at 60; New Trinidad Lake Asphalt Company, Limited, £300 6 per cent. debenture bonds at \$1,460, and 10 shares of trust certificates at \$485; Ohio Mining and Manufacturing Company, \$17,000 first mortgage 5 per cent. bonds and \$600 bonds scrip at 25½; Otis Engineering and Construction Company, 13 shares at \$10 for lot; Pneumatic Pulverizer Company, 1,000 shares at \$4 for lot; Retsof Mining Company, 1,300 shares at \$16, \$20,000 first mortgage 5 per cent. bonds at 83, \$3,000 bonds at 93½ and \$4,000 bonds at 92; Seattle Coal and Iron Company of Washington, 200 shares at \$5 for lot; Seattle & Eastern Construction Company, 125 shares at \$28 for lot; Standard Hand Rock Drill Company, 500 shares at \$9 for lot; Santa Fe Copper Company, 900 shares old stock at \$2; Sunday Creek Coal Company, 17 shares preferred at \$46 for lot; Standard Steel and Iron Company, 250 shares at \$3; Shef-

field & Birmingham Coal and Coke Company, 272 shares at \$16; Texas & Pacific Coal Company, \$2,000 first mortgage bonds at 107%; Virginia, Tennessee & Carolina Steel and Iron Company, \$12,000 8 per cent. bonds at \$1,500 for lot, \$46,000 6 per cent. bonds at \$500 for lot, \$17,000 mortgage for \$100, \$50,000 6 per cent. collateral trust bonds at \$100, \$160 and \$200 of the same at \$25 for lot, \$34,000 6 per cent. bonds at \$50 for lot, and \$12,000 8 per cent. bonds at \$100 for lot.

listed on the Boston Stock Exchange, only five paid dividends during 1899. In 1898 there were six dividend payers out of a total of 23 mines. In Montana the percentage of dividend payers is much higher, so far as Boston ownership is concerned, three out of a total of four mines paying dividends. The following table shows the total dividends paid in 1899 by Boston's Lake Superior and Montana copper mining companies:

The Boston Stock Market in 1899.

By Our Special Correspondent.

The story of the Boston Stock Exchange in 1899 might well take a volume in the telling, but to compress it into a column forbids more than the briefest mention of the leading incidents of the year. The accompanying table, which shows the sales on the Exchange by months, will indicate the course of business, and a study of the large

Table showing Dividends and Per Share for various companies like Calumet & Hecla, Boston & Montana, Anaconda, Parrot, Quincy, Tamarack, Osceola, Wolverine, and Totals.

FLUCTUATIONS OF MINING STOCKS AT BOSTON DURING 1899.

Main table showing fluctuations of mining stocks at Boston during 1899, with columns for Name of Company, Par Value, and monthly price ranges (High/Low) from January to December, plus a final Sales column.

(a) Montana. (b) Michigan. (c) Arizona. (d) Colorado. (e) California. (f) Nova Scotia. (g) Missouri. (h) Utah. (i) British Columbia. (j) North Carolina. (k) New Mexico.

table of quotations will give the reader a fair idea of the course of the market.

The total is the largest ever reported for these mines in a single year.

To compress all into a few lines, we began in January the boom which carried all of us away; when every one began to buy coppers; when the promoter ran riot and everything with copper attached to its name—zinc came in later—sold at rapidly increasing prices, without the least regard to its real value. Then all the prospect holes and abandoned mines in the Lake Superior Company were capitalized and the stocks sold with a rush. When the Lake was not enough, Utah, Wyoming, New Mexico, Colorado and Canada were brought in. The amount of money put into new companies was enormous, and the old stocks were sold at prices beyond all previous records. While much of the buying was by speculators, who hoped to sell again at a profit, much also was by investors who lost their heads.

The check to the boom, and the beginning of the reaction, began with the formation of the Amalgamated Copper Company. The intro-

Summary table showing Listed Shares, Unlisted Shares, and Bonds for each month from January to December, with a Totals row at the bottom.

Out of the 33 Lake Superior copper mines, the shares of which are

duction of a new element into the copper market, and the adoption of blind pool tactics threw a shadow over the market, which resulted in a long stagnation of business, and finally in the December panic, and the failures of the Globe and Broadway banks.

Of this final crash it is too soon to speak judicially; Boston will not recover from it for years to come. We can only say that there is a

The Colorado Mining Stock Exchanges in 1899.

By Our Special Correspondent.

With an increased gold production in the Cripple Creek District in consequence of the electric railway and enlarged treatment facilities at the mills and smelting works, speculation in these stocks has been

FLUCTUATIONS OF MINING STOCKS AT COLORADO SPRINGS, COLO., DURING 1899.

Table with columns for Name of Company, Par Value, and monthly price fluctuations (H, L) from January to December, plus a Sales column.

FLUCTUATIONS OF MINING STOCKS AT DENVER DURING 1899.

Table with columns for Name of Comp., Par Value, and monthly price fluctuations (B, A) from January to December, plus a Sales column.

very bitter feeling and a general belief that a long story is still to be told; and also that the Globe was bolstered up just long enough to let certain insiders save themselves. Whether true or not, this feeling will show consequences for some time.

very active during the year. Coupled with this is the flotation in England of a number of properties, including the well-known Independence Mine, under the name of Stratton's Independence, Limited. The dividend list has also been increased by the addition of mines that were

mere prospects a few years ago. This naturally favored the incorporation of many new companies whose properties are principally in the undeveloped stage.

The volume of business transacted on the Colorado Springs Mining Stock Exchange was considerably more than in 1898, and the Denver Exchange also shows an improvement, though trading on its board depends largely on the quotations ruling in Colorado Springs.

It is worthy of note that there are comparatively few stocks dealt in at less than 1c. a share, and the majority of those that formerly sold around this price are now higher, as will be seen by reference to our tables.

The rich strikes made in several of the larger properties during the year have been reflected in the stock market, as, for instance, in Isabella. This stock brought 37c. in January, rising to \$1.58 in the same month, while in June it dropped to 35c., recovering to \$1.24 in October, and sold in November at \$1.50, receding again to \$1.25 in December.

In the lower-priced stocks, Jack Pot showed large trading, selling

\$6, when home support was lacking. No longer are the honest Nebraska farmers, known as the Mercur crowd, a coterie to conjure with, and their pets—Geyser Marion, Ingot, Daisy, Four Aces and the others—are out of favor.

In February there were premonitions of a general softening, but an impression was spread abroad that the weakness was temporary, and that soon prices would go higher. From early spring, with a few brief spasmodic upward spurts, declines have held sway till in the past few weeks a pessimist might affirm the market is near a final dissolution.

There has not been an ore uncovering of noteworthy magnitude in a single property whose shares were floated a year, or a year and a half ago, and while the ore tonnage for 1899 shows a handsome increase, the tone of the market is not improved therefrom, as naturally would be expected. Then the Daisy hocus-pocus, perpetrated by the promoters of the company, where a magnificent monthly output of lies misled even careful investors—and more recently the New Mammoth salting episode and kindred manipulations have discouraged speculation.

The Park City list leads, both in dividends and enlarged ore production. Silver King holds first place; the shares having advanced from \$35 in January to \$55 to-day. The dividends for the year amount to \$650,000. Daly-West has had an eventful 12 months. Early in the year

FLUCTUATIONS OF UTAH MINING SHARES IN 1899.

Table with columns for Companies, Par Value, and months from January to December. Each month has two columns for the 7th and 21st of the month. The table lists various mining companies and their stock prices over time.

NOTE.—This table gives the closing bid quotation on the first and third Saturday of each month. As near as may be, this affords the best index of the Salt Lake market and generally is but little under what the shares can be bought for particularly for the active traders.

from 35c. in March to 74c. in September, and at 59c. in October. Mt. Rosa sold up from 17c. in May to 50c. in November; Pinnacle from 5c. in January to 39c. in October; Tornado from 26c. in July to 54c. in November; Work from 15c. in January to 36c. in September; El Paso from 10c. in January to 50c. in August; Anaconda from 33c. in January to 62c. in February, and in November at 42 to 61c.; Mataoa from 29c. in January to 46c. in February, and down to 24c. in June up to 39c. in September; Golden Fleece down from 62c. in February to 23c. in July, and Argentum from 40c. in January to 20c. in June, recovering to 34c. in August and declining to 20c. in November.

The close of the year indicates that 1900 will show a further improvement in speculation, and in a number of instances higher prices will rule.

Salt Lake Stock Market in 1899.

A more marked contrast can hardly be imagined than the status of Utah mining shares in the opening and closing weeks of 1899. The year began in a period of strong advances, when the impression was deep-seated that the current quotations did not represent the actual values of the properties. Mercur, whose annual report in January showed that generous dividends had been sustained throughout the year from the sale of an exceedingly rich gold-yielding tract—not from its own mining operations—had the first awakening. Immediately following the re-election of the old board, dividends were suspended for five months. New England and other outside holders, believing in the inherent worth of the mines, prevented sharp declines by buying above

the number of shares was increased from 75,000 to 150,000 to include the Haggin interest, and active mining began in the spring. Last December the shares could be had for \$4.50 in October; prior to the first \$30,000 dividend, they sold at \$13.50, since which they have swung from \$13 to \$12. A probable change of management occasions uneasiness and weakness at present. Dividends amount to \$170,000, including a Christmas extra of \$30,000. Ontario has steadily put on strength, as conditions at the mines assured a new dividend era, which came in December. Anchor and Valeo have done nothing of note. Daly-West quietly grows in favor.

Tintic stocks have supplied the bulk of the trading and furnished the greater number of sensations, pleasant and otherwise. Ajax fails to achieve the success anticipated, due in a measure to the Newhouse-Weir rupture. At the property, exploration moves forward under cheering conditions. Bullion-Beck maintained a regular \$10,000 dividend each month until December. To-day there are no considerable ore reserves in the company's ground, though a magnificent face of profit-paying rock is exposed in lower workings across the dead-line in Gemini territory, and probably Bullion-Beck shares will not soon recover. Centennial-Eureka, the Utah corporation, closed a glorious career a short month since, and Centennial-Eureka, the Maine corporation, has more recently cut a lively caper on the Boston market in which many may regret sacrificing their shares. The original company had 30,000 shares; the new company 200,000—100,000 issued and 100,000 set apart for treasury needs. It will be dealt in on the Boston Exchange. Mr. A. F. Holden, who was chosen president December 20th, received the support of Salt Lake purchasers, who, knowing the intrinsic worth of the shares,

bought generously as they were thrown overboard December 15th to 19th.

Eagle-Blue Bell has fluctuated, drooping toward the end of the year as the market became stagnant, though the outlook for this exploration seems bright. Four Aces is a rocket that has returned to earth with its fire and sizzle spent. All its ore anticipations are in South Swansea ground; to establish its title thereto a suit is filed and present quotations for its shares, plus the assessment, indicates the probable outcome. Grand Central's dividend career came to a sudden halt in September, when a trespass suit was brought against Mammoth. Prior to this the management had averred there were generous reserves in ground not in controversy, which has proven false. Exploration is in progress on 900-level and elsewhere, and recovery for the shares depends on what this achieves. Joe Bowers should be nearly out of the woods through the compromise arranged, by which the number of shares will be increased from 400,000 to 700,000; the new 300,000 to be issued to the Burnham heirs. This adjusts the title difficulty out of court. Lower Mammoth continues to raise hopes, though false alarms of ore finds grow tiresome, and they are apt to occur when another assessment is soon to be levied. Mammoth, under the personal regime of President-Manager Samuel McIntire, is no less erratic than before. Since buying control, in June last, \$260,000 in dividends have been paid and he promises to maintain this record, but some yarns as to ore reserves have caused a drop in the shares. The Grand Central law suit does not appear to cause much uneasiness. May Day is one of the most likely of the new Tintics. Richmond Anaconda has been taken in by Jesse Knight of Hamburg fame and kind fortune still seems to smile on him. South Swansea held up well through the year, recovering speedily from the bear onslaught following the filing of the Four Aces suit. It paid \$52,500 in dividends in 1899, and with improved equipment and vertical shaft good results should follow. Star Consolidated occasions disappointment, for while exploration has been conducted faithfully, no quantity of shipping ore is opened. A voluntary assessment of 10c. is being contributed to the treasury by nearly all the holders. Sunbeam has made one of the best records of the year and it is liable to afford other pleasant surprises to its shareholders. Swansea paid 12 regular dividends of \$5,000 and an extra \$5,000 for Christmas. It is the best stock of its class, and its 1900 record promises well. Tetro remains an anticipation; the shares hold about unchanged and the mines show everything but profit-paying ore.

Of the Mercur list there is nothing hope inspiring. With the exception of Mercur the other stocks are weak and not encouraging. As to Mercur, the future largely depends on the personnel of the directorate after the annual meeting this month.

Horn Silver has done but little business on the Salt Lake Exchange and prices have ruled a shade below those in New York. Dexter has fallen far short of the forecast; undoubtedly the low figures to-day, compared with a year ago, are attributable to a Quixotic management and the recent change can hardly fail to be an improvement.

The accompanying table gives the fluctuations during the year of stocks somewhat widely distributed; others, mostly held locally, would add to its length without being of special interest. While on the surface the outlook for the Salt Lake market is less attractive than a year ago, it presents opportunities for profits to discreet buyers.

The London Mining Stock Market in 1899.

By Our Special Correspondent.

The chief features of the London mining market during 1899 have been, first, the flatness of South Africans, due to the political tension, and afterward the war; second, the boom in copper companies' shares, together with the introduction of many new copper propositions, due to the great advance in the price of the metal; and, third, the boom in Kalgoorlie mines and their continued advance as gold producers.

At the commencement of the year there was considerable activity in South African gold, diamond and land shares. In spite of the friction between the Transvaal Government and the Outlander leaders, it was hardly supposed even in the best-informed places that a war would actually break out. The British South Africa Company considered it a favorable opportunity to make a new issue of shares, and experienced no difficulty in obtaining all the money wanted. Afterward Mr. Rhodes succeeded in obtaining satisfactory terms from the German Government for the construction of his Cape-to-Cairo Railway, and arranged also for a branch line through German West Africa. In the early part of the year, also, quite a number of companies for working mines in Rhodesia were promoted, and a certain number of Rhodesian mines commenced and continued milling. So that, in spite of the oppression of the mining industry and the Outlanders in the Transvaal, the outlook seemed quite hopeful. In the spring and early summer, however, the political hitch began to assume a serious aspect and the eventual outbreak of hostilities put the shareholders in South African shares into an unenviable state. Their assets are being damaged by most of the mines being idle and by others being worked for the benefit of the Boer Government, and no one knows the amount of damage and loss which will be sustained. Shareholders, however, have shown no signs of panic and the market has been practically non-existent. The decline in quotations has been gradual, and nothing approaching a slump has occurred. At the time of writing, the English army's attacks have been repulsed three times in a week, and the depression of spirits naturally arising from such incidents has had considerable effect on the Stock Exchange generally from consols downward, but mining shares have not suffered any more than other classes of speculation and investment. Of course all South African companies have had to suspend the payment of dividends, although many of them had plenty of funds to distribute, as no one knows what amount of money will be required to put the mines into order again, or how long it will be before the rightful owners come once more into possession of their properties.

The West Australian section of the mining market has been to the front all the year. Speculation has been centered almost entirely in the Kalgoorlie group, which includes some phenomenally successful

producers of gold. The shares in the owning companies have provided the promoter and the public with excellent opportunities for speculation. Lake View Consols, Ivanhoes, Associated Gold Mines, Great Boulders, Golden Horseshoes, Great Boulder Perseverance, Hannan's Brownhill and others have been followed keenly by the speculators and during the summer and autumn immensely inflated prices ruled the day. Some of these companies have paid excellent dividends, but others, such as Associated Gold Mines, seem to have been mismanaged and little profit has been made on the handling of rich ores. All the mines have had setbacks due to the difficulty in dealing with the refractory ores. Having no smelters near at hand, such as are to be found in the vicinity of the similar gold-field, Cripple Creek, the managers have been obliged to evolve some new plan of treating the ore on the spot. In some cases three or four different processes have been tried, all at considerable cost, and even now the final form of the extracting plant has by no means been arrived at.

A feature of the West Australian mining market has been the failure and apparently final disappearance of Horatio Bottomley. Mr. Bottomley was once a very great power in the market, as far as speculation was concerned, but his companies existed mostly on his talk and comparatively little on actual mines, though he was the original introducer of the Associated Gold Mines Company. His great promoting companies have all collapsed this year and his attempts at reviving them have failed. He has also tried to float new companies and to reconstruct old ones, but the public were not attracted and his influence seems to have gone. On the other hand, his old rival, Whitaker Wright is still soaring on the wings of prosperity. Mr. Wright has shown excellent results at Lake View Consols and Ivanhoe, and he has been successful in reconstructing a group of his failures in the form of a new company, the Standard Exploration Company, after he had thrown in a make-weight in the form of a placer property on Baranoff Island in Alaska.

Though speculation has been keen in the West Australian market, very few new properties have been introduced to the public. Great Boulder Perseverance became a regular producer and the promoter, Mr. Gardner, introduced vast quantities of vendors' shares on the market, large numbers being sold at high prices. Mr. Darlington Simpson, having been successful in working the Peak Hill Mine, introduced two other properties to the public, Lake Way and Horseshoe Peak Hill, but neither of these properties were much more than prospects. Beyond these, no opportunity has been afforded the public for speculating in new West Australian ventures.

The market in shares in copper mines has been active all the year. The quotations of such regular producers as Rio Tinto and Cape Copper have advanced to high figures and the profits realized have been very satisfactory to shareholders. Early in the year Anacondas also advanced in favor, but its absorption in the Amalgamated Copper Company under Rockefeller control caused it to lose its popularity and holders are inclined to sell. The Mount Lyell group has not shared in the advance to any extent and comparatively little is heard of the shares in the market, owing chiefly to the continuous fall in the grade of the ore. Promoters have seized on the opportunity afforded them by the high price of the metal to place before the public quite a large number of new companies; in fact, if it had not been for the copper boom, the number of new issues during the year would have been small. Of the 17 new companies floated publicly, very few of them have been worth looking at. Perhaps the best was the Lloyd Copper Company, Limited, which was formed to acquire the well-known producer at Bathurst, New South Wales, but, although the mine and the brand have an excellent reputation, the prospects of continuance of the mine and of the high price of copper were not great enough to warrant the terms on which the company was floated. Then there was the Panuco Copper Company, formed by the Rio Tinto people to acquire a mine in Mexico, but after the company was floated the directors had reason to doubt the statements in the prospectus regarding the quality of the ore, so operations are suspended until further independent evidence is obtained. The Broken Hill people floated the Einasleigh Freehold Copper Mines at Gilbert, Queensland; the North Mount Lyell Company floated the Mount Lyell Blocks Corporation; Mr. Alexander Hill floated the Ray Copper Mines in Pinal County, Arizona; all three of which appear to be of fairly promising proportions, though objections in detail might be urged against them. Besides these the following copper companies have been offered to the public: The Caledonia Copper Company, with which may be bracketed the Caledonia Nickel Corporation, floated by Whitaker Wright without any independent report, and at high capitalization, to work properties in New Caledonia; The Mount Lyell Comstock Company, and the Mount Lyell Copper Estates Company, to work properties in Mount Lyell District; the Colonial Copper Corporation, to work mines in Bathurst, New South Wales; the Balla Balla Copper Mines Company, to work properties in North West Australia; and the Paramatta Copper Mines Company, floated on the story of its neighbor at Moonta; the Mount Chalmers Company, to work properties near Rockhampton, Queensland; the Copper King Company, to work the mine of that name in Fresno County, California; the Buena Vista Copper Company, to work copper mines near the Boleo; the Caridad Copper Company and the Tablas Finana Copper Company, to work properties in Spain; the Ardilla Copper Company, to work properties in Portugal, not far from Huelva, Spain; and the Balkan Copper Corporation, to work properties in Turkey; but none of these companies are likely to do any good.

The Indian gold mines have continued to be favorites in their comparatively limited circle; the Mysore and the Champion Reef have done well for their shareholders. New Zealand mines, with the exception of those in the Waihi District, have ceased to attract the public. The Broken Hill silver mine shares have been quiet all the year in London, and no company except the Sulphide Corporation (which used to be the Ashcroft Company) has attracted much attention. The success of this company in treating its ores according to the usual system has been gratifying to the shareholders. A company called the Oural Gold-Fields of West Siberia was formed during the year to acquire certain gold mines in that part of the world, but no real progress appears to have

been made so far. The Briseis Tin Company was formed to acquire tracts of placer ground carrying tin, in the Mount Bischoff District of Tasmania.

The most noteworthy feature of the American market has been the introduction of Stratton's Independence Mine, Cripple Creek. The English company formed to work it has a capital of £1,100,000, of which £1,000,000 in shares went as purchase price and the other £100,000 provided in cash as working capital.

San Albino Gold Mines Company has been formed to acquire properties in New Segovia, Nicaragua; but neither of these hold out any promise of success. The Anglo-Colorado Exploration Company, promoted by the late Baron von Richtofen, has had to confess failure; while the Jersey Lily Company of Arizona has been wound up owing to the discovery rather late in the day that the buyers had been salted.

British Columbia has disappointed English capitalists and speculators, as the mines and prospectus acquired developed into much lower grade propositions than was expected. Of all the properties of the British America Corporation only the Lerol is a paying concern, and even this is proving to be of lower grade than formerly, and is yielding less

FLUCTUATIONS OF MINING STOCKS AT LONDON DURING 1899.

Table with columns: Name of Company, Location, Shares Issued, Par Value, Dividends Paid in 1899, and monthly price fluctuations (H. and L.) for January-March, April-June, July-September, October-December, and Year. Includes companies like Alaska-Mexican, Anaconda, and various Transvaal and Cape Colony mines.

C. Copper; D. Diamonds; G., Gold; L., Lead; S., Silver; Sul., Sulphur.

Browne's opinion that the purchase price was too high for the mine, the prospectus had to be withdrawn, and the issue cancelled. Mr. Newhouse's Utah Consolidated and Boston Consolidated created much interest in the earlier part of the year and large blocks of shares were sold at high prices.

The other properties of the Corporation have had large sums of money spent on them, but the question as to their eventually paying for development and for working is quite an open one. The properties acquired by the London and British Columbia Gold-Fields are now promising to pay, though it is only after careful study of concentration and treatment that the desirable end has been reached.

ited, have all done badly, though one of the subsidiaries dealing with transport to Klondike has paid expenses. The companies promoted by Mr. Grant Govan have all collapsed owing to the ore shoots giving out.

One or two properties in the Lake of the Woods District have been introduced to the public, for instance, the Foley Mine and the Sultana Mine; but none of the companies formed in previous years to work properties in this district have so far yielded dividends. A company called the Edmonton Gold and Platinum Dredging Company has been offered to the public; and also the Cariboo Consolidated and the Kootenay Perry Creek Company have been floated; but none of these three are very likely to succeed. I have already mentioned the Standard Exploration Company, of Whitaker Wright, which has been formed among other things to acquire an option on gold placers on Baranoff Island, Alaska.

As regards the Klondike, only a very few new companies have been formed this year, and the response has been poor. The shares in older

of electrical power, resulting in the formation of a company to provide this. A plant is now being established at Floreston, on the Truckee River, and by next June the Comstock Companies will be able to avail themselves of abundant power at a minimum expense. This may mean effective drainage of the deep workings, with all that implies in the way of reopening old ore bodies abandoned in the past through lack of facilities to handle the water.

This should inaugurate a new era in the history of Comstock mining and tend to revive speculation in the shares. Until this is accomplished, however, a wide range in fluctuations can hardly be expected. Just now the only bright prospect in the way of ore exists in the Consolidated California Virginia, where some high-grade rock is being extracted from the 1,750 and 1,850 levels. Enough of this material is in sight to justify the belief that dividends may again be paid. The present condition of the market can best be judged from the fact that the leading stock has dropped steadily for weeks, in the face of en-

FLUCTUATIONS OF MINING STOCKS AT SAN FRANCISCO DURING 1899.

Table with columns: Name and Location of Company, Par Value, and monthly price ranges (High/Low) from January to December for various mining companies.

Klondike companies are of doubtful value and no dividends have been forthcoming so far. Of new companies, MacDonald's Klondike Bonanza, Limited, and the Klondike Government Concessions, Limited, are the only two which have been offered for public subscription. English promoters are now paying more attention to the Atlin and Cape Nome Districts. Several mining engineers have been sent there to acquire properties, and perhaps in the near future we may hear more of their doings.

Other incidents of interest to the mining market this year have been the reconstruction of the Elmore Copper Depositing Company, by means of which a large sum of working capital was provided; the flotation of Park Brothers and Company of Pittsburg and of Bell Brothers of Middlesbrough as limited companies; the flotation of the Egyptian Salt and Soda Company, to work natural deposits of these chemicals in Egypt; and the failure of the much-lauded Koneman process for treating the Kalgoorlie ores.

It should also be noted that the executive and the law-makers have been actively engaged in doing their utmost to eliminate the swindler and the fake limited company. Several old offenders have been sent to prison; the judges of the High Court, where winding up of companies is carried on, have been outspoken in their comments and in their advice to public men; while the general amendment of limited liability law is being seriously considered. But it will be a herculean labor to cleanse the Augean stable.

The San Francisco Stock Market in 1899.

By Our Special Correspondent.

Were it not for the certainty that modern methods are to be introduced on the Comstock lode within a few months, it would be difficult to draw a happy horoscope of the future of the mining share market in San Francisco. To judge by appearances, speculation has been dying a slow death for months, and that in the face of a decided improvement at times in the mining prospects. All the better class of operators have deserted Pine Street temporarily, leaving the market at the mercy of an element which has got a bare livelihood by tearing down things at every attempt made by a small inside clique to rehabilitate them by intermittent and short-lived bull movements.

And yet the year has been one of the most momentous in the history of the lode. New methods have been inaugurated and evolved into practical shape. The scheme to unwater the lower levels of the Comstock by a hydraulic lift has been most successful, and in a few months the immense volume of water has been drained 120 ft. below the 1,950-ft. station in the Consolidated California Virginia shaft, or about 420 ft. in all from the point of commencement. When the tremendous flow in the lower levels along the entire length of the lode, constantly draining to this shaft as a sump, is considered, the work accomplished is remarkable. Still the fact is unappreciated by the average speculator on Pine Street.

A limited supply of water to work a complete system of hydraulic elevators at different points along the lode suggested the introduction

of couraging reports from the mine, and a large weekly output of a high grade of ore. With Consolidated California & Virginia suffering from such a depression, the balance of the stocks representing unproductive mines are naturally weak and lifeless.

The record of the year has been the worst in the business, which has been going from bad to worse ever since January last. The only hope for the future lies in the introduction of the new mining scheme, enabling the production of bullion. The total transactions on the San Francisco Stock Exchange for 1899 show aggregate sales of 6,370,152 shares.

DIVIDENDS AND ASSESSMENTS.

The year 1899 has been productive of many new dividend payers and increased distributions by some of the larger companies. The total dividends paid this year amounted approximately to \$51,948,000. The most important dividend mining properties were Calumet & Hecla, which is credited with \$10,000,000; Boston & Montana, with \$5,375,000; Anaconda of Montana, with \$3,900,000, and Amalgamated Copper (the Standard Oil venture), \$3,000,000. In the industrial list the largest distributions were made by Federal Steel, \$3,196,000, and American Steel and Wire, \$2,800,000.

The assessments levied in 1899 amounted to \$1,970,584, showing a decrease as compared with 1898. Of this total the Geyser Mining Company, of Colorado, levied the largest part—\$200,000; Martin White, of Nevada, holds second place, with \$120,000, and Consolidated California & Virginia, of the Comstock lode, \$108,000. The California assessments have increased, and so have those in Utah.

DIVIDENDS. (\$1—\$1000; total, full amount.)

Table with columns: Name and Location of Company, and dividend amounts for years 1892 through 1899, plus Total Paid.

DIVIDENDS.—Continued.

Table with columns: Name and Location of Company, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, Total Paid. Lists various mining companies and their dividend payments over time.

DIVIDENDS.—Continued.

Table with columns: Name and Location of Company, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, Total Paid. Continuation of the dividend table from the previous page.

C, copper; g, gold; i, iron; l, lead; m, mica; p, phosphate; q, quicksilver; s, silver; z, zinc.

ASSESSMENTS.

Table with columns: Name and Location of Company, 1893, 1894, 1895, 1896, 1897, 1898, 1899, Total Levied. Lists companies and their assessed amounts.

ASSESSMENTS.—Continued.

ASSESSMENTS.—Continued.

Table with columns for Name and Location of Company, years 1893-1899, Total Levied, and Name and Location of Company, years 1893-1899, Total Levied. The table lists numerous mining and engineering companies and their respective assessments over time.