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CONTENTS.

THE MINING regulations issued by the Chinese Government, which are given on another page, show characteristic Chinese subtlety. While apparently framed in accordance with the treaty obligation to open the country to foreign enterprise, they appear on careful examination to be so devised as really to discourage the opening of mines. The imposition of a tax of 25 per cent on net earnings, in addition to royalties of 5 to 25 per cent on product, will hardly be accepted by new companies; while other rules as to police and the like will probably prove additional burdens. Prospecting for and opening mines in China involves certain risks which operators must assume; and the taxes and other obligations imposed by the new regulations will not help matters.

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THE GERMAN cement manufacturers have suffered very severely from the business depression and the decrease in new construction work in that country, as well as from the decline in exports, especially to the United States. The different syndicates which have heretofore controlled the production are practically going to pieces, the individual manufacturers, who compose the associations, being in many cases compelled by their necessities to sell at any price they can get. It is reported that cement has been offered in several cases as low as $3 per metric ton by makers; a price which is considerably below the cost of production. This state of affairs is not difficult to account for, if the recent estimate of German authority is correct, that the factories in operation have a total capacity of 29,000,000 barrels of cement yearly, while the consumption last year was about 14,600,000 barrels, and the exports have fallen off considerably.

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THE TRAFFIC passing through the Sault Ste. Marie canals in May was the largest ever known for that month in the history of the Lake trade. The total freight passing through the canals in that month was 4,425,669 tons. For the period from the opening of navigation to May 31 the record is also extraordinary. Comparison cannot be made with last year, as May was an extremely light month, owing to the late opening of navigation and the strike of the engineers. We therefore give the total freight carried and the leading items of mineral traffic for this year in comparison with the similar statement for 1900:

	1900.	1901.	Changes.
Total freight carried, tons	4,565,879	6,764,893	I. 2,199,014
Iron ore, gross tons	2,619,320	3,980,450	I. 1,361,130
Coal, tons	880,040	1,037,066	I. 157,026
Copper, tons	19,423	14,311	D. 5,112

The decrease in copper was chiefly due to the fact that considerable shipments were made by rail during the winter. It is worth while to note that the business done into and out of Lake Superior for the first two months of the season 1902 is in excess of that for any full year in the history of the lakes up to 1889, and is more than the combined totals of all the years of lake traffic up to 1878.

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THE STRIKE of the Pennsylvania anthracite miners continues with no prospect of an immediate settlement. There have been no serious disturbances about the mines, though the strikers by intimidation and the use of the boycott have been trying to get the men now acting as pumpmen, firemen and engineers to stop work. These efforts have had no great success and from all accounts the companies are able to keep the water in the more important mines under control.

Col. Carroll D. Wright, Commissioner of Labor, has been in New York during the week collecting data on the strike and on related matters such as the wages paid mine employees, etc. He has taken up this investigation, at the suggestion of President Roosevelt, with the purpose of giving the public light on some apparently obscure phases of the labor situation. His report will doubtless command attention, and should prove beneficial.

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SILVER SHIPMENTS to the East have improved somewhat during the past two months, though the demand from China is still seriously affected by the indemnity payments. India, however, has bought more freely under the inducement of lower prices, while exports to the Straits make a better showing. The following table shows the values of the shipments from London and San Francisco for the five months ending May 31; to which we have added the approximate quantities of the metal represented by these values at the average prices of each year:

	1901.	1902.	Changes.
China, from San Fran.	$1,358,324	$2,023,818	I. $665,494
China, from London	1,650,408	80,300	D. 1,570,108
Total, China	$3,008,732	$2,104,118	D. $904,614
India, from London	16,253,265	15,097,262	D. 1,156,003
Straits, from London	389,217	304,897	D. 84,320
Total	$19,651,214	$17,506,277	D. $2,144,937
Approximate ounces	32,379,600	32,527,400	I. 147,800

It will be seen that, notwithstanding the decrease in values this year, there was a slight increase in the approximate quantity of silver shipped. This difference was due to the much lower average value of silver this year. In recent months there has been an improvement in the shipments to China from San Francisco, which has partly offset the very great decrease in those from London.

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THE GOLD production of the Australian States and New Zealand for the first quarter of the current year makes a good showing; especially when short water supply in a number of districts is taken into account. Moreover, the first quarter of the year in Australia is usually the period of light production, so that the promise for the balance of the year is very good. The figures in the following table, showing the output for the three months ending March 31, are furnished by the *Australian Mining Standard;* and our contemporary has reduced to fine gold the bullion statements made by the mining departments of the different States:

	Fine ounces.	Value.
Western Australia	428,229	$8,851,493
Victoria	151,427	3,129,996
Queensland	127,412	2,633,606
New South Wales	66,513	1,374,824
Tasmania	9,627	198,990
Total Australia	783,208	$16,188,909
New Zealand	88,677	1,832,954
Total	871,885	$18,021,863

An exact comparison is not possible, since we have only the crude or bullion statement for last year. We find, however, that Western Australia and New South Wales showed considerable in-

creases; Queensland a small decrease, Victoria and New Zealand larger ones. The output of South Australia is not reported, but it is small in amount and would add very slightly to the total.

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MARKET CONDITIONS.

Iron and Steel.—The iron markets continue to show about the same degree of activity that we have recorded in recent weeks. Nominally, there has been no change in quotations, but very little new business is being done on the standard of the current or official prices. Practically all the orders that are being entered at the present time are from belated purchasers, who require supplies for early delivery, and who are forced to pay for them premiums varying in amount. Outside of pig iron, few contracts are being made which run beyond January, 1903, but there is little doubt that some will soon be closed.

The strike of the blast-furnace workers in the Mahoning and Shenango valleys has been practically settled by a compromise; the operators agreeing to pay an increase in wages, while the three-shift demand is given up for the present. This will put into full operation a number of furnaces which have been banked, and will enable them to go on without further interruption. The coal strike in the West Virginia districts is not expected to interfere seriously with the production of coke in that State.

The import business appears to be on the increase, and it is stated that several contracts of considerable amount have been placed in Germany for basic steel billets, at a price which will put them here at about the same as current seaboard quotations.

Among the peculiarities of the present situation one is that the price of steel billets is $7 or $8 a ton higher than that of rails. Another is that old steel rails, fit for relaying, have sold at $2 or $3 a ton higher than new rails.

Other Metals.—The copper market shows very little change, and may be considered firm. Domestic consumption continues on an unparalleled scale, while exports, though a little below the level of February and March, are still very large. Moreover, the exports appear to be mainly for consumption, and have lost the somewhat speculative character of those made in the early months of the year. These exports and the current domestic consumption have, in fact, exceeded the United States production thus far this year, and have made a considerable draft upon stocks, as is shown in another column. At the present time the leading producers appear to be well sold up to August, and spot copper is not to be had. At the same time there do not appear to be any speculative holdings, or if there are such, they are closely kept, and their amount cannot be very large.

Tin is steady in price and in good demand, although the spot supply is somewhat better than it has been. A slight increase in Banka production is reported, and it is said that an increased quantity will be offered at the next sale.

Lead continues unchanged, with a good consumption.

In spelter, prices are a little stronger, although it is now generally conceded that the strike in the Kansas smelters will not be successful. The present prices, however, are more nearly in accordance with the prices paid for ore than has been the case for some time past, and it is probable that they will be maintained, especially as consumption is very good, both among the brass-makers and the galvanizers.

Silver prices again show a slight improvement, and the market is in a rather more satisfactory condition than it has been for some time past. While the Chinese market continues somewhat demoralized. the shipments from San Francisco to Hong Kong have shown an improvement this year. The table in another column gives the totals.

Coal.—The Western coal market continues to be mainly dependent upon transportation, and conditions are not very much improved. While the supplies in the larger cities are more satisfactory, the Lake trade still continues in bad condition, and shippers are unable to secure the cargoes which they need to supply the demand. Vessel owners are complaining very strongly of the delay which they experience in loading at the Lake Erie ports. In West Virginia conditions are still uncertain, and it is difficult to ascertain the truth, owing to the conflicting reports sent out in the interests, respectively, of the mine operators and the union.

There is nothing new in the seaboard bituminous coal trade, although the additional demand in New York and other cities, owing to the anthracite strike, is still a feature in the market. The anthracite trade continues to depend entirely upon strike conditions, which are discussed elsewhere.

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STOCKS OF COPPER.

The question of probable stocks of copper on hand is one that attracted much attention about the beginning of the year, and concerning which many wild statements have been made. Owing to the conditions prevailing then, and since, it has been impossible to obtain direct statements from the parties chiefly interested, and mere guesses were of little use. From information now at hand, however, it is possible to make estimates which must approximate the facts. In the following table we present such estimates of production, consumption and surplus for the United States in 1901, comparing them with the completed statement given in *The Mineral Industry* for 1900. The figures are in long tons, of 2,240 pounds:

	1900.	1901.	Changes.
Total domestic production	268,229	270.616	I. 2,387
Imports in all forms	46,342	60,871	I. 14,529
Stocks, January 1	39,608	41,541	I. 1,933
Total supplies	354,179	373,028	I. 18,849
Exports	157,469	90,366	D. 67,103
Approximate consumption	155,169	171,875	I. 16,706
Total	312,638	262,241	D. 50,397
Stocks, Dec. 31	41,541	110,787	I. 69,246

It will be seen that the estimated increase in stocks on hand at the close of the year corresponded very nearly to the decrease in exports. It must be remembered that the ordinary or normal stock of the metal carried amounts as a rule to about two months' production, and that the quantity brought forward from 1900 was not at all unusual. The accumulations or abnormal stocks at the opening of the present year were therefore not far from 65,000 tons, according to the figures given. Really they were less than that, since the figures for 1900 did not include metal sold and in the hands of manufacturers; the amount of which it is impossible to ascertain, and which usually represents a large quantity. Now it is well known that at the end of 1901 manufacturers had for some time been buying only as their absolute needs required, and that their stocks were far below the usual level. Making allowances for this, it is probable that the surplus was really less than 50,000 tons, or much below the figures which were circulated by so-called authorities.

Since the beginning of the present year there has been a large decrease in the surplus copper in this country. The figures for May are not yet at hand, but for the four months ending April 30 a close estimate shows the following result, also in long tons:

Production		89,745
Imports, net		11,454
Stocks, January 1		110,787
Total supplies		211,986
Exports	67,656	
Approximate consumption	71,430	139,086
Balance, stocks on hand May 1		72,900

In this table we have estimated only the actual consumption, and not the sales. The exports, of course, are a matter of record. But sales have been in excess of consumption, and the surplus stocks on hand May 1 are no longer concentrated in a few hands as they were at the beginning of the year. They are largely distributed among manufacturers and consumers, and the quantity unsold is probably rather below than above what we have called the normal stock. In other words the copper market is returning to a natural condition.

Meantime consumption in this country continues very large—probably larger than it has ever been before. The fact that users of copper have considerable quantities on hand will therefore not deter them from buying more, when they can obtain what they want on reasonable terms. Consumption abroad is also improving somewhat, though the heavy buying on foreign account has passed for the time, and users are supplied, probably to a greater extent than those in this country.

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SALT LAKE CITY AS A SMELTING CENTER.

Salt Lake City has been for a long time an important smelting center, but lately the magnitude of its interests in that industry have increased greatly. By the end of the current year there will be four comparatively new works—two of which are still in process of construction—in operation and bidding for the ores which are tributary to Salt Lake City. These are the Highland Boy smelter, with a capacity for about 500 tons of ore per day; the Bingham, which treats about 400 tons; the new plant of the American Smelting and Refining Company, having an estimated capacity of about 1,000 tons of ore per day, and that of the United States Mining Company, which is designed to smelt about 850 tons. The new plant of the American Smelting and Refining Company is nearly completed and should be ready to begin partial operation by the mid-year; that of the United States Mining Company is not so far advanced and will hardly be ready before September, a good deal depending upon the delivery of the material for construction. Of the older plants of the district, which were taken over by the American Smelting and Refining Company, the Germania is the only one which continues in operation; the Mingo is dismantled and the Hanauer completely demolished. Presumably the Germania will be shut down when the new works are completed, inasmuch as it is a question if the present, or rather the immediately prospective, smelting capacity be not in excess of the existing ore supply. However, the three copper smelters draw chiefly from their own mines in Bingham Cañon, which are presumably opened ahead sufficiently to furnish the necessary supply of ore, although the United States Mining Company will derive a large supply from its Centennial-Eureka at Tintic, the ore of which has heretofore gone to the lead smelters, and the reduction in freight rates on low grade stuff, which has recently been made by the railroads, will tend to increase the available supply of ore from miscellaneous sources.

The Salt Lake smelting works are situated at Murray and at Bingham Junction (West Jordan) about

seven to ten miles south of the city. The American Smelting and Refining Company's plants at Murray are nearest the city; then follow in order the Highland Boy, Bingham and United States, the two latter being immediately adjoining. The Highland Boy employs reverberatory furnaces, following the Butte practice, the advisability of which for smelting the Utah ores is doubtful; at all events, it is noteworthy that neither the Bingham nor the United States has adopted that method. The Bingham reduces its ore pyritically in blast furnaces and the United States is to do the same. The Bingham has lately installed a converting plant and is now in a position to turn out pig copper. The new United States plant is also being provided with a converting department. Although these smelters are essentially copper producers and are not to any important extent in the open market for gold and silver ores, they do nevertheless work up a good deal of ore that the silver-lead smelters used to get. There has been some talk that certain of them would erect lead smelting furnaces, but this is probably still in the air, although it would not be an unnatural development.

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INDUSTRIAL HISTORY OF THE ANTHRACITE REGIONS.

No study of the present conditions of the anthracite industry can be thorough and conclusive, unless it includes the history of the last forty years, which furnishes the explanation of many things, otherwise incomprehensible or misleading. Unfortunately our modern public, overfed from day to day with innumerable items of "news," has lost its power to remember facts; and the lessons of the past are pretty generally disregarded. Kipling's famous refrain, "Lest we forget!" might well be our national prayer. Perhaps a few words, from an old man who has not quite forgotten, may be wholesome as a reminder.

The abnormal conditions of the anthracite industry began during the war for the Union, when anthracite coal, as a well-nigh smokeless fuel, was imperatively needed for the blockading steamers of the United States Navy. The demand was consequently enormous, and the prices and profits were correspondingly high.

The operators of that period were mainly lessees, working the mines for a period of years, paying royalty upon the amount of coal actually marketed, and consequently interested in immediate profits only, regardless of the waste or destruction of the coal resources of the region. For the same reason of purely temporary interest, they were ready to concede almost anything demanded by their miners, rather than interrupt the harvest of gain which was certain to be, for them, in two senses temporary: (1) Because the end of the war would probably moderate the insatiable demand for anthracite; and (2) because the expiration of their leases would end their individual profits. If the demands of "organized labor" raised the cost of coal too far, the contest was easily settled by saddling the extra price on the public, which meekly paid it, not having then, to the same extent as now, the alternative of using bituminous coal.

The situation thus created lasted for some time after the war. Those were the halcyon days of the miners' union (afterwards less favorably known as the "Mollie Maguires"). It adopted the system of payment per car of coal hoisted, without reference to the amount of labor performed by the miner—under which system the miner employed and paid his own "laborer," to load and tram the coal. I remember one case (occurring while I had charge of a colliery in the Schuylkill region) in which a miner, finding that the chamber which had been assigned to him was a so-called "running breast" (*i. e.*, one in which by reason of the steep pitch and other local conditions of the seam, the coal continually dropped of itself, without needing pick or drill to stimulate it), went across the Atlantic on a vacation, and returned after three months, to find a sum to his credit in bank, enough to give him, after paying the real "laborer," about $1,000 of net profit. In other words, this man (like thousands of others, aware of his good luck, though themselves in varying degree less fortunate) practically felt and fared, not as an employee, giving value in work for what he received in money, but as a partner, furnishing no capital and running no risk of loss. This is the historical origin in that particular region, of the notion now generally diffused among "labor unions" that the workman has (outside of any contract) some sort of legal right to his place, and that his remuneration should be, not the actual value (however determined) of his actual work, but a proper share (he being judge of what is proper) of the profits of the whole business.

It followed, of course, that these self-supposed partners in profits, but not in losses, thought they had something to say as to the running of the business, so that immediate profits should be as large as possible, while, at the same time, there should be plenty of work at such rates of profit for the members of their organization. So they proceeded to regulate the day's work of each man, and the total output of each colliery. My friend, the late Eckley B. Coxe, used to tell how his door bell would be rung in the evening, and a committee of his employees would enter, in perfectly friendly fashion, to say, "Mr. Coxe, we don't think No. —.had better run for a while. There is too much coal going to market"—and how he used to reply, "All right, gentlemen; please give me notice when you think it best to start again!" As I know from Mr. Coxe's own lips, he was not in the least deceived as to the nature and the inevitable tendency of such a *régime*. But he was too wise to make futile resistance; and when he knew that he must surrender, he regarded it as wisdom to do so with good-natured readiness. I have sometimes wondered whether this policy, pursued as it was by many others as well as by him, was really the best. But, on the whole, in view of all the conditions then prevailing in the anthracite regions, I am inclined to think they were right.

The situation above indicated was essentially altered by two factors, namely:

1. The acquisition of large anthracite properties by corporations, which, as owners rather than lessees, had a direct interest in improving the methods and diminishing the irrevocable yet unnecessary waste of coal in mining. The effect of this new force deserves a separate discussion. For the present, I will say only that its tendency has been, at all times, to promote the stability of the anthracite industry, to increase its duration, and to insure just and kindly treatment, duly proportioned to individual skill and merit, of its employees, besides encouraging among them habits of thrift and the increase of intelligence; —and that whatever opposition has been encountered in the attempt to secure these objects has come from the mistaken and suspicious, or selfishly hostile, leaders of "labor unions."

2. The second factor above mentioned was the development of the labor unions into the cruel tyranny of the "Mollie Maguires," an organization which was less foolish than the "National Mine Workers," because it did not surrender itself to the control of the representatives of a distant competing industry, and because it pretended, at least, to be a benevolent society, taking care of widows, orphans and invalids. The "Mine Workers," on the other hand, make no pretence of caring, either for widows or orphans, for private property, or for national resources. In these respects the new organization is less respectable than the old. But I do not believe that Mr. Mitchell, its bituminous chief, is planning or deliberately permitting, as did Jack Kehoe, cold-blooded assassinations, and a universal reign of terror. He may have started a fire which he cannot, and which he ought to have known that he could not, control. But I do not, on that account, charge him with arson. In fact, his weakness is that he is too young to have learned the terrible object lesson furnished by the anthracite regions before he reached years of discretion.

R. W. RAYMOND.

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COAL AT VLADIVOSTOK.

CONSULAR REPORT.

The varieties of coal used at this port and in this vicinity are, in the order named, Japanese, Sakhalin, and Cardiff; no American is employed.

The Japanese coal can be landed at Vladivostok at from 11 to 12 rubles ($5.66 to $6.18) per ton, including freight charges—2.50 to 3 rubles ($1.29 to $1.55) per ton.

Cardiff coal, by far the best and most popular, costs c. i. f. Vladivostok from 40 to 50 rubles ($20.60 to $23.18) per ton.

Sakhalin coal, delivered at wharf, costs from 13 to 14 rubles ($6.70 to $7.21), including freight at 3.25 to 4 rubles ($1.67 to $2.06) per ton.

There are several local coal mines owned by private firms, but the product is not of a superior character; the best is said to be the Startseff mine, in which Messrs. Crompton & Schwabe have a half interest. The Ussuri Railroad Company used this coal until last year; but becoming dissatisfied with the quality, the managers have recently concluded a contract for five years with the prison department of Sakhalin. This railroad uses some 60,000 tons yearly. Messrs. Clarkson & Co. have several mines of fairly good coal; but it is not uniform in quality; they can deliver in Vladivostok at 8 rubles ($4.12) per ton.

Most of the coal produced here is lignite and friable. The Chinese Eastern Fleet is an important consumer, and from 10 to 15 new steamers are expected to be added to the service.

The Russian naval squadron in the Pacific uses foreign coal—mostly Japanese—to the value of 1,000,000 rubles ($515,000) annually.

The Government some years ago made a special examination of the coal in the South Ussuri section. The report mentioned especially some mines at Su-Chau, near the Su-Chau River, 20 versts (13.2 miles) from the beach—some 60 miles from Vladivostok by sea and nearly 100 miles by land. The coal is anthracite and is pronounced superior to that of Japan in quality. This mine was formally opened in January, 1902. Active work has been begun and a railroad will connect the mine with the Ussuri line, making transportation to this port easier. The money has been appropriated. The demand for all departments around Vladivostok, exclusive of the naval need, is estimated at 100,000 to 120,000 tons for the current year.

The local supply has made perceptible inroads on Japanese imports. In 1899, Japan sent 93,156 yen ($46,392) worth of coal; in 1900, 8,862 yen ($4,413). Distance and freight charges seem to prevent competition on the part of United States coal at present, though in quality it is considered just what is needed.

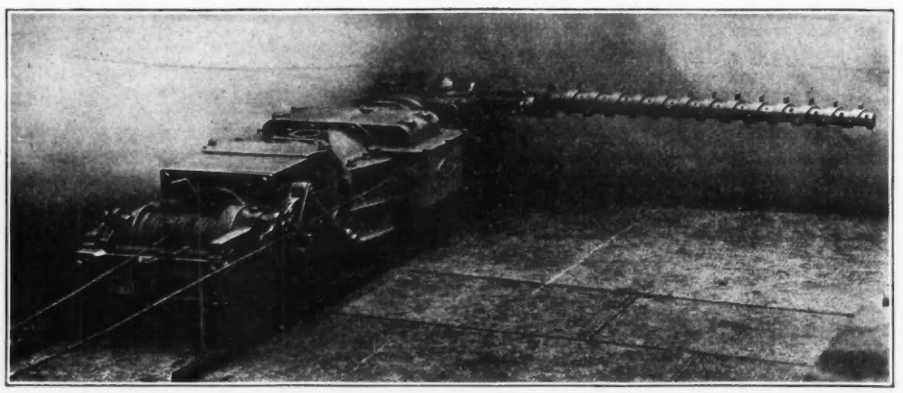
The whole Maritime Province is rich in all kinds of minerals. The region about St. Olga Bay has iron ore, the percentage of which is said to be higher than that of the Urals. There is also much silver and lead about Olga. The distance from St. Olga Bay to the Ussuri Railroad is from 170 to 200 versts (112.7 to 132.6 miles).

COAL-CUTTING MACHINERY IN BRITISH COLLIERIES.—II.

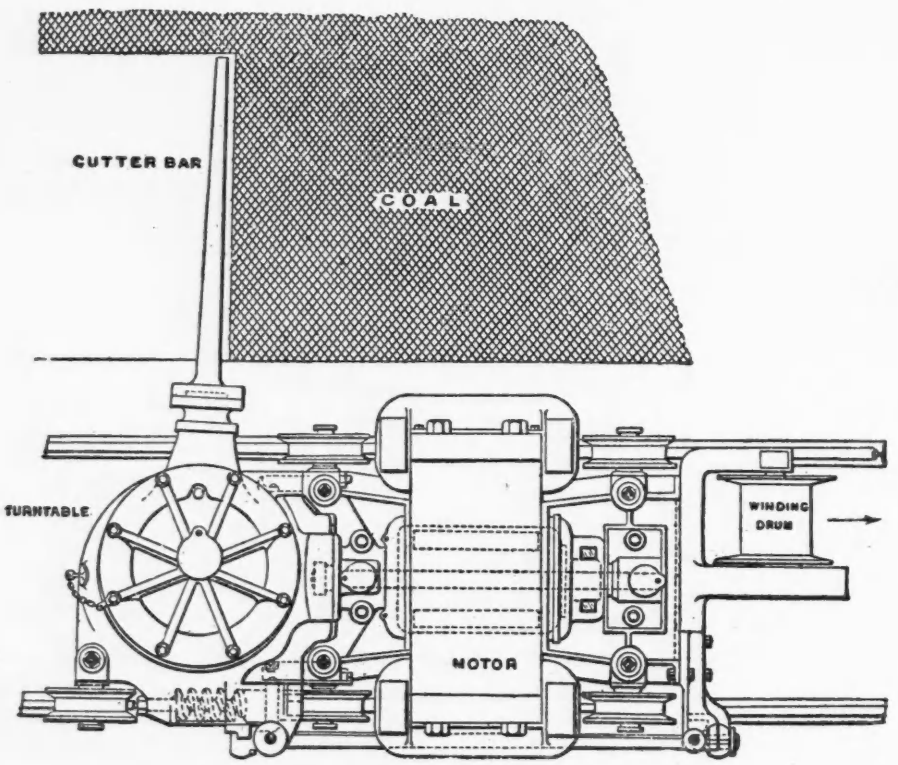
By SYDNEY F. WALKER.

THE BAR COAL-CUTTING MACHINE.

The bar coal-mining machine, like the disk machine, is used entirely for long-wall mining and was designed to take the place of the disk machine. It will be seen that there are two points in the disk machine capable of improvement. As the disk itself works under the coal, to the depth of the cut that is being made, if the coal settles down on the disk (which not infrequently happens if the holding is not properly shored up, or if the coal itself is brittle), the disk is caught and it is difficult to extract. Also, as the disk revolves at only 70 revolutions at its fastest, while the engines run at 200 revolutions and the electric motor at 800 or more, the matter of the gearing is of considerable importance. It absorbs power, and it is a fruitful source of increased friction, if dust gets in between the wheels. For that reason it was thought that a bar, revolving at from 300 to 500 revolutions, presenting only a small surface in place of the large surface of the disk, would have considerable advantages. Nevertheless, though the bar machine has done good work in places, it has never been so successful as the disk. At present there are two bar machines at work in British collieries, the Goolden, and the Hurd. The Goolden machine, the writer believes, is not now on the market, those in use being the survivors of the machines that were sold when the machine was boomed. It should be mentioned that great things were expected from the Goolden machine when it was first introduced, both by its inventors and by a number of mining engineers. The inventors were so confident of success that they formed a syndicate among themselves, and some of their mining friends, to cut the coal at a certain price, providing machines, power and attendance. The speculation was unfortunately a failure.



HURD'S ELECTRIC BAR COAL CUTTER.



GOOLDEN BAR ELECTRIC COAL-CUTTING MACHINE.

The bar machine consists of a taper bar attached to and worked by gearing driven by an electric motor. No bar has so far been driven by compressed air, the motor, gearing, etc., being carried by a frame very similar to that used in the disk machine. The bar stands out horizontally from the frame of the machine in the position occupied by that radius of the disk which is at right angles to the main body of the machine. The cutting tools are carried on the periphery of the bar, arranged in a spiral manner round it. The bar is also loose and slips into a socket arranged for it in the shaft attached to the last of the wheel train. The bar is also arranged to cut its way into the coal. The machine runs on rails in front of the coal face, just as the disk machine does, and when a cut is to be started, the bar lies horizontally in line with the face. The bar is revolved, and at the same time is caused to turn upon a horizontal axis, cutting into the coal as it turns, until it arrives at the position at right angles to the body of the machine. It then simply revolves, cutting the coal, clay or dirt, as it revolves, and the whole machine is pulled forward, as the cut is made, in the same manner as with the disk machine. The bar can be moved vertically and horizontally. The cutting tools are very much smaller than those used with the disk machine, and consist of small picks. The shank of the pick is made with a rib and is driven into a hole in the bar provided for it. With the Goolden machine there has been difficulty in getting the dirt out of the cut, after the machine has passed. If the dirt is not got out, the coal sometimes settles down again, forming the dirt into a hard mass, which has again to be loosened by hand. With the Hurd machine, this is provided for by cutting a spiral groove on the bar, and by placing a plate behind the bar, forming with the spiral groove an Archimedean screw, along which the dirt runs out in a continuous stream. All of the gearing in the Hurd machine is inclosed in cast iron boxes forming part of the machine as shown, but this has not relieved the trouble caused by the dirt getting in among the gear wheels. It is found that the reciprocating motion which is necessary with the bar machine, the in and out motion of the bar itself, so that the bar may clear itself, tends to lead the dirt in among the gear, notwithstanding its protective covering. The fine dirt settles upon the oiled surface of that portion of the bar which is outside the machine, when the car moves outwards, and passes in with the same portion when it moves inwards, and from there passes along among the rest of the gearing. Where the bar machine has been used to cut in the coal, it has worked well. It has also worked well in other places where it has been cutting in the clay, or other dirt, but in the majority of those cases the repair bill has been serious. Where pyrites are present, it is not always so easy to deal with them. If the bar is guided round the pyrites, as it can be, by means of the gearing provided, all goes well, but if it is allowed to engage with them the cutting tools break, and become themselves a source of trouble. The bar machine is, the writer believes, destined to do well, but it requires a great deal of attention yet.

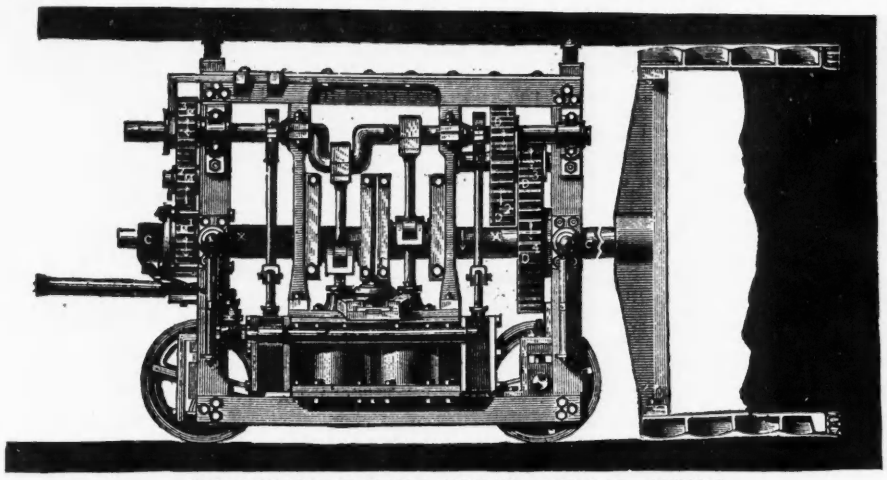
HEADING MACHINES.

The chain breast machine need not be described here, nor its modifications, or predecessor, the breast bar machine, as they are both American importations, and are well known in their own country. It will perhaps be sufficient to say that an increasing number of them are being used, entirely for heading work, for driving the headings required for opening out the colliery and for forming the haulage, traveling roads, etc. In South Wales, at one of the large collieries, a heading fifteen feet wide, one a slope, is being more or less continuously driven, the plan adopted being to place the machine at the top of the heading face, cut its width, then shift the machine its width further down by levers, handspikes, etc., cut another width, and so on till the whole width is cut, when the coal is got down by means of a few shots, and the machine is hauled up to the top again by a winch. A chain heading machine in use in one of the northern counties cut from 12 to 15 cuts per shift of 8 hours, each cut being 5 feet 6 inches by 3 feet 6 inches. The percussion machine is also used to a small extent in British collieries, principally in Lancashire, for cutting headings. At present, the Ingersoll-Sergeant is the only one on the market, or in use, though others, notably the Harrison, have been employed. In Lancashire they speak highly of the machine, and say that it is very economical. In Yorkshire, they have never been able to use it for long, mainly on account of the objection of the men. A colliery manager in Scotland who used the Harrison machine for certain work, and with success, stated that at first he found the same difficulty with his men. It was not the old union objection to any machine, but the men stated that the vibration caused by the machine pulled them all to pieces. The manager in question, however, states that with practice the men found the trick of the machine, just as the Americans who came over with it had, and then they were able to work it quite as well as the Americans. The trick appears to be to guide the machine, not attempt to hold it. Guiding is easy, holding is hard work. In Lancashire, the work done by percussion machines is given as 12 feet by 4 feet 6 inches; 65 feet in 4½ hours by two machines working together. At the colliery mentioned, the cut for the machines is

compressed in the pit by a polyphase electric motor.

THE STANLEY HEADING MACHINE.

This is a distinctly British machine. It is made by the Nuneaton Engineering Company, Nuneaton, Warwickshire, which is also a colliery owner, and is used largely in its collieries. Its principal work is in cutting the main headings on opening out the colliery. When a colliery is opened on this side, the first thing that is done as soon as the shafts are down is to drive two headings well out towards the boundary of the royalty, the ground over which the colliery is to extend. Branch headings are driven out from them to form faces, etc., for working the coal. It will be understood that it is of great importance to a colliery to get coal into the market at as early a date as possible so as to begin to earn something toward expenses. It is therefore of the utmost importance that the opening out, the driving of the principal headings, forming of the main roads, etc., should be done as quickly as possible, and for this purpose, the Stanley machine has been designed, and appears to have done



STANLEY MACHINE FOR CUTTING ANNULAR GROOVE.

good work. There is the usual difference of opinion as to whether there is any saving on the actual cost of driving the main headings, but there appears to be no doubt as to the speed at which the work is done. Messrs. Stanley Brothers, the inventors of the machine, claim that the machine not only cuts the heading quicker, but cheaper. Some colliery owners confirm this, but others, notably Mr. James Dixon, the present president of the Institute of Mining Engineers, who used the machine for opening out Hamilton Palace Colliery in the west of Scotland, one of the most modern collieries, states that he found it 4 times as quick, but twice the cost. The machine, which is shown in the drawings, consists of a crosshead, forming the diameter of the circle the machine is to cut. The center of the crosshead turns upon an axle carrying a pinion which forms the last of a train of gearing, the first of which is connected to the crank shaft of the engines. The crosshead carries short arms at its extremities at right angles to it as shown, these carrying cutting tools, whose office is to cut away the coal, or the dirt, as the whole revolves. The apparatus is driven by a pair of engines worked by compressed air. The engines are mounted vertically and the crank shaft also works the feeding mechanism by means of which the revolving arms are moved forwards as the cut is made. The cut forms an annular groove in the coal, leaving a cylindrical core, which is got down either by hand, or by blasting in the usual manner. When the machine has cut as far as it can go, the feed is run back, the machine itself run back to allow the men to get in front of it, and when the core has been got down, and the coal removed, the machine is again brought up to the face, and a fresh cut made, and so on. The machine runs on one pair of wheels, set in line with its axis. Two modifications of the Stanley machine have been made, though the writer has not heard of either of them being much used. One is intended to cut roads from 70 to 100 per cent wider than those cut by a single machine, at one operation. The apparatus consists of two machines connected together mechanically, each making its own annular groove, leaving a piece between the two grooves, which is got down in the same way as the cores. This form of machine is used principally for thin seams, and for very wide roads. Mr. Dixon used two separate machines at Hamilton Palace Colliery. The other modification is intended to cut away the whole of the face, instead of cutting an annular groove, so that the road can advance with great speed. In this machine the crosshead has cutting tools along its entire length, instead of carrying arms at right angles to the tools. As the bar sweeps over the coal face, it cuts it away in small chips, which are carried to a tube by a scrober attached to the crosshead, and are there taken charge of by a screw conveyor working inside the tube, which delivers the cuttings behind the machine. The Stanley machines have so far only been worked by compressed air, though arrangements have been made to work them by electric motors, or by ropes if required. The power absorbed by the machine is stated to vary from 25 h. p. to 45 h. p., according to the nature of the material cut, the rate of cutting 3 or 4 yards a day of 8 hours with the annular groove machine, including all stoppages, clearing coal away, etc. With the machine cutting the whole of the face away at one operation the rate is stated to be 6 yards per day of 8 hours. The following figures from Mr. Dixon's experience at Hamilton Palace Colliery may be interesting.

The two machines were worked side by side, each cutting a groove 5 feet in diameter. The two engine cylinders were 9 inches in diameter, by 9 inches stroke, and the gearing between the cutting shaft and the crank shaft was 13 to 1. The arms carrying the cutting tools projected beyond the crosshead 3 feet. The average distance cut in a shift of 8 hours was 4 yards, and the average cost of cutting per lineal foot, 5 feet in diameter, was 2s. 2d. The actual time in each shift was 8 hours 14 minutes, made up as follows: Cutting coal, 1 hour 18 minutes; breaking and throwing back coal, 13 hours 43 minutes; shifting and readjusting the machine, 3 hours 13 minutes. The small coal made in the groove was shovelled back by hand, and the central core usually broke down.

The Stanley machines are made to cut annular grooves from 4 feet in diameter up to 7 feet, and in the same sizes for double machines, and for full cut machines those which cut away the whole of the face of the coal. One point has been noted by those who have used the machine. It should be arranged to cut always in one strata, either coal, or rock. If the cutting is partly in coal, and partly in clay, trouble usually arises from the unequal effort required at different parts of the circle.

COINAGE OF SILVER IN VENEZUELA.—Consul E. H. Plumacher writes from Maracaibo, April 16, 1902, that a recent decree issued by the President of Venezuela orders the coining of 2,000,000 bolivars ($386,000) in silver money, three-fourths of this to be in 5-bolivar (96 cents) pieces and the rest in 2-bolivar (38 cents) pieces.

THE MINERAL CREST.*

By Dr. Walter P. Jenney.

In the limestone area of Tintic and other mining districts of the Great Basin region of Utah, it has been observed that surface-outcrops of ore occur but seldom, and are mainly confined to points of relatively low elevation, where the veins cross some basin or ravine. Nowhere does a considerable body of ore outcrop on the tops or high up on the slopes of the hills. Mining operations, on the other hand, have shown that large and continuous ore-deposits frequently occur in depth in the limestone, beneath large masses of barren rock. Such ore-bodies, when followed upward in the lodes, are found to terminate at well-defined levels, without reaching the surface. Yet the ore-bearing fissures themselves extend above the top of the ore, being often traceable, though barren of all valuable minerals, for hundreds of feet above the stopes in the mines, and even observable in outcrops at the surface.

This abrupt cessation of the ore at a uniform horizon does not appear to be connected with any change in the country-rock adjacent to the lodes. The strata above and below this horizon seem to be in every way equally favorable to ore-deposition. Explorations above it have developed an open-fissured country, barren not only of ore, but also of indications that mineral-bearing gold, silver, lead or copper were ever deposited in the strata at that elevation.

The height reached by the ore, while usually constant throughout the length of a given lode, may vary in particular sections, from the operation of local causes. Each lode in a district has its own distinct horizon, above which the ore-deposits do not extend. Where the ore-bodies are continuous for a long distance on the strike, and other conditions are uniform, the top or apex of the ore is nearly level or gently undulating; but more commonly its upper surface is broken into a series of peaks and pinnacles, alternating with flat summits and wave-like crests, reaching up from the main ore-channel to practically the same relative altitude, and forming the ore-crest or mineral crest of the lode.

Examination discloses in these mines many evidences that the terminal edge of the ore nearest to the surface represents, substantially, the height to which the mineral-depositing solutions ascended in the fissures during the period of ore-formation; in other words, that the present ore-crest is the high-water mark, or ultimate level, reached as the result of the ascensional force of the heated ore-bearing waters.

In some instances, lines of extinct mineral-vents, nearly over the ore-bodies, on the surface, mark the course of the lode. These are small local outcrops of quartz, chalcedony, siderite, ankerite, barite and other gangue-minerals, seldom carrying more than traces of the precious metals. It is not improbable that, during the period of ore-deposition, these vents were geyser-like pipes or channels, extending from the ore-deposits, hundreds of feet below, up through the non-mineralized strata to the surface, and constituting points of escape for steam and gases liberated by the chemical reactions incident to the formation of the ore. Surface-explorations of some of them indicate that they were channels of up-flow for the waste waters expelled by the pressure of the steam and gases, after the deposition of the ores in the deeper strata. Among other evidence supporting this view is the occurrence in thick, banded sheets, lining crevices and open channels, in these outcrops, of white, translucent chalcedony, a mineral deposited by hot silica-bearing waters.

To better understand these peculiar phenomena, it is necessary to consider the conditions attendant upon their formation. The earlier volcanic disturbances of the region are regarded as the direct cause of the elevation of the districts and the upturning of the sedimentary rocks, producing the numerous small mountain ranges and solitary island-like upheavals which illustrate the varied types of the Basin Range structure.

*Paper read before the Philadelphia meeting, American Institute of Mining Engineers, May 15, 1902.

These earlier disturbances were followed by a long period of comparative rest, during which a wet climate prevailed and an extensive erosion of the exposed strata occurred, carving the surface of the districts to nearly their present contour. There were the same low mountain ranges, with spurs projecting like promontories into the sands of the desert, their steep slopes deep-cut by narrow, rocky ravines, or scooped out in basin-formed gulches.

Later disturbances, deep-seated in the earth's crust, formed the vein-fissures and induced the deposition of the ores, at a time when the topography of many of these mining districts varied little from the present surface. The recent erosion, which has taken place since the deposition of the ores, has probably not removed, even on the more exposed slopes, more than 100 to 200 or 300 feet in depth of rock-surface. This preservation of the ancient topography has been due, in great part, to the change in climate. In the present extremely dry period, surface-erosion is reduced to a minimum. So little are the outcrops of the ore-bodies eroded, that the conclusion seems inevitable that the present arid climate has prevailed continuously since their formation.

In such districts, the outcrop, or intersection of the vein-fissures with the old surface-erosion, would be, in profile, an irregularly broken or serrated line, rising from the lowest points, where the fissures crossed some deep ravine or basin, to summits where the fissure-belt cut through the tops of the hills or divides. Under these conditions, the mineral solutions, forced upward in the fissures, found outlets of escape at places of relatively low elevation along their course, with a consequent reduction of head or hydrostatic pressure so great that, no matter how open the fissures, or how favorable the ground, no considerable deposits of ore could be formed above a certain level, depending upon the elevation of the outlets and the volume of the discharge, through them, of the heated waters, with the accompanying steam and gases.

Not only has the hydraulic head been controlled by outlets to the surface, but the escape of the solutions from the fissures into the walls and into the country-rock adjacent, especially in mines in limestone, has also acted to some extent in the same way. The slow circulation of the mineral-depositing solutions through large caves or chambers, or through the interspaces in great masses of brecciated rock, from the extent of surface exposed and the free escape of steam and gases, has caused a reduction of both temperature and initial pressure.

During the long period of ore-deposition, fluctuations caused by any increase or diminution of pressure or of temperature in the ascending waters would naturally occur in the hydrostatic level. It must have been subject to various accidents, such as the opening of new outlets at lower levels, or the choking or closing, by any cause, of outlets long in action. Moreover, the upflow through the fissure would be modified by crustal movements opening or closing its channels, and thus affecting both its volume and its pressure. Many other factors—for instance, the specific gravity of the solutions and the proportion of steam and gases mingled with them—must have had their effect.

Since the completion of the primary ore-deposition, oxidation and re-formation of the minerals have tended to move the ore-crest downward in the fissures; but the quartz and other gangue-minerals remain, together with oxidized ores in such quantity that there is usually little difficulty in determining the original crest-level.

In most mining regions erosion has been so great, since the period of mineral-deposition closed, that many hundreds and often thousands of feet of strata have been removed, destroying all record of what occurred in the upper parts of the veins. So far as observed by the writer, mineral crests such as have been described above occur only in those districts in the Basin Region where, at the time the ores were deposited, the surface was deeply cut by erosion, and the later climatic conditions have been such as to preserve the old surface with little alteration—a combinations of conditions which are exceptional.

CRITICISM OF DR. JENNEY'S PAPER.

BY GEORGE OTIS SMITH, Washington, D. C.

The somewhat exceptional features discussed by Dr. Jenney in his paper were recognized and described by Mr. Tower in the report on the Tintic District for the Geological Survey. The general absence of surface outcrops of important ore-bodies and their occurrence, when present, at relatively low points are noticeable characteristics in this district, and the statements made by Dr. Jenney agree in general with our observations. The approximately horizontal upper limit of the Silver Gem ore-body in the Bullion-Beck Mine is figured in this report, and mention made also of the horizontal pipes of ore found in several mines. In only one case, however, was any hypothesis presented to account for this horizontal character of the ore-body. In the Sioux and Utah mines, the parallelism of the ore-body with the bedding planes suggests an explanation for the horizontal crest; that, however, would not apply elsewhere. Facts which bear on Dr. Jenney's hypothesis and may be used to test it, are found in the Eureka zone in the Tintic District. Here in three mines, Centennial Eureka, Bullion-Beck and Gemini, whose workings connect, there occur ore-bodies which though distinct are located on the same general system of fissures, and these are found to have quite well defined horizontal crests of the character described. Within a distance of less than half a mile there is a difference in the upper limits or crests of the three adjacent ore-bodies amounting to 900 feet, a vertical range which seems too great to be referred to any definite hydrostatic level.

Another line along which Dr. Jenney's paper may be discussed is that of the conditions under which ore deposition took place in this region.

This discussion may also serve to illustrate how essential to a study of ore deposits is a complete understanding of the geologic history of the area. The sequence of geolgic events, as given in the paper here discussed, is: (1) Volcanic disturbances causing elevation and folding of the sedimentary rocks; (2) Wet climatic conditions with consequent extensive erosion; and (3) Deep-seated disturbances forming the fissures and inducing ore-deposition; with (4) A slight amount of later erosion.

The geologic history, as interpreted by Mr. Tower and the writer, from the results of geologic mapping of an area of over 200 square miles, as well as the more detailed study of the mining district itself, is quite different. It may be briefly stated as follows: (1) Elevation of the region, with folding of the Paleozoic sedimentary rocks, fissuring and ore-deposition. (2) Erosion, which began with the Mesozoic uplift and continued into the Tertiary, producing a surface with greater relief than that of today. (3) Tertiary volcanic activity, the earlier rhyolitic lava filling deep cañons, on the slopes of which talus containing ore fragments was cemented by the lava, and the later andesitic lava flows, largely rejuvenating the deeply eroded mountain range. (4) Fissuring and ore-deposition in the more compact igneous rock, with possible additional mineralization of the sedimentary rocks, as suggested by Mr. Emmons. (5) Erosion, by which great masses of igneous rocks have been removed, with only slight changes in the topography of the limestone ridges, which had been buried by the lavas.

Comparison of the two interpretations shows a considerable absence of agreement as regards the sequence of geologic events. The occurrence of ore fragments in the pre-lava talus is directly opposed to the recent age given by Dr. Jenney to these ore-deposits of the sedimentary rocks. It seems probable also that hundreds, if not thousands, of feet of strata may have been removed here since the principal period of mineral deposition closed, so that in this respect the Tintic is not different from other mining districts. If, however, the mineralization even took place in the latter part of the period of erosion that preceded the volcanic activity, it is again true that the present topography of the region is far from being what it was at that time. The upper part of Eureka Gulch is still filled with rhyolite, so that the pre-lava cañon was deeper than the present gulch and may have drained eastward instead of westward, as at present.

These topographical relations would involve surface outlets below some of the mineral crests in this vicinity. It appears, therefore, that the present arid climate has not prevailed long enough to make the question of ore-deposition so exceptionally simple in the Tintic region, and if Dr. Jenney's hypothesis of the hydrostatic origin is to be accepted for the mineral crests, reference must be made to a topography quite different from that of the present and much more ancient than he has suggested.

MINERAL PRODUCTION OF SOUTH AUSTRALIA.

We are indebted to the Mines Department of South Australia for a statement of the metals and minerals exported from that State during the year 1901. The quantities and values are given in the table below:

	1900.		1901.	
	Quantity.	Value.	Quantity.	Value.
Gold ounces	3,721	£14,494	4,918	£16,613
Copper, tons	4,886	371,920	6,770	468,606
Copper ore, tons	2,367	22,526	1,866	23,011
Lead, tons	383	4,382	...	...
Silver-lead ore	...	17,526	...	...
Tin, tons	...	...	2.65	86
Manganese ore, tons	...	...	132	330
Unenumerated	...	441	...	1,753
Total values	...	£431,289	...	£511,121

Additional products, not included in the exports, were salt, of which 32,574 tons were gathered in 1900 and at least an equal quantity in 1901; and iron ore, of which considerable quantities are used as flux in smelting.

The increases of importance last year were 1,197 ounces, or 32.2 per cent, in gold; and 1,884 tons, or 38.3 per cent, in copper. No silver-lead ore was reported in 1901. The gold last year was equal, by values, to 3,911 ounces fine gold.

The returns from the Northern Territory, which is attached to South Australia, are as follows for the year 1901:

	Quantity.	Values.
Gold bullion, ounces	22,572	£76,579
Gold ore and concentrates, tons	2	30
Silver ore, tons	104	710
Tin ore, tons	80	5,498
Copper ore, tons	482	8,460
Wolfram ore, tons	5	175
Total values	...	£91,452

The gold bullion reported was equivalent, by value, to 18,028 ounces of fine gold. If this be added to the output of South Australia proper, it makes a total of 21,939 ounces fine gold, or $453,489 for the year.

THE EXPORTATION OF SOUTH RUSSIAN COAL.—The Russian Consul-General publishes some interesting details dealing with the possibility of importing South Russian coal into the lower basin of the Danube. Only imported coal is consumed in the region referred to, as the Roumanian coal is quite unfit for use. The steamship companies prefer to use English coal, the prices of which vary from about 6 cents to 9 cents per pood of 36 pounds. In the Danube ports, Tultsha, Ismail, Kilia, Reni, Galatz and Brailoff, and at Bucarest, the center of the industrial activity of Roumania, the cost of coal at Sulina is increased by the additional cost of freight along the Danube, and, in the case of Bucarest, by the railway charges for transport thither. In consequence of the extraordinary high price of coal in 1900 the Russian Black Sea and Danube Steamship Company was compelled to obtain supplies of Russian coal, which were delivered at Reni at the rate of 10 cents per pood, or $6.25 per long ton. This state of affairs gave rise to the question as to whether the opportunity was not favorable for finding a market for South Russian coal in the basin of the Lower Danube. But at this moment the Russian coal industry is passing through a severe crisis, for the output exceeds the demand and new markets must be found, but as the Russian Government is now engaged in taking steps to promote trade between the ports of the Black Sea and the Danube ports, Russian exporters ought to make the most of the opportunity to develop in the latter region their exports of coal, petroleum and mineral oil.

MINERAL PRODUCTION OF GREAT BRITAIN.

In our issue of March 22 last, we gave the preliminary statement of the production of the coal and metal mines of Great Britain as then issued. This included nearly complete figures for coal and other important products. We have now the complete statement of production from all three classes of workings specified in the British mining laws and regulations—coal mines, metalliferous mines and quarries. These statements, as prepared under the direction of Dr. C. LeNeve Foster, inspector of mines, are given in the accompanying table. The figures are all in long tons, of 2,240 pounds:

Mineral Output of Great Britain.

	1901.				1900.
	Coal Mines.	Metalliferous Mines.	Quarries.	Total.	Total.
Alum shale	3,954	...	...	3,954	1,308
Arsenic	...	3,361	...	3,361	4,081
Arsenical pyrites	...	2,578	...	2,578	9,573
Barytes	...	26,413	1,200	27,613	29,456
Bauxite	...	10,191	...	10,191	5,779
Bog ore	...	...	2,606	2,606	4,153
Chalk	...	4,564	4,323,780	4,328,344	4,373,331
Chert and flint	...	2,976	127,591	130,567	77,693
Clays and shale	2,971,110	104,907	11,085,860	14,161,877	14,049,694
Coal	219,037,240	...	9,705	219,046,945	225,181,300
Copper ore and copper precipitate	...	6,792	...	6,792	9,488
Fluorspar	...	4,164	50	4,214	1,488
Gold ore	...	16,374	...	16,374	20,802
Gravel and sand	...	11,863	1,947,066	1,958,929	1,837,202
Gypsum	...	151,199	49,567	200,766	208,038
Igneous rocks	...	98,912	4,950,400	5,049,312	4,634,301
Iron ore	6,849,926	1,671,025	3,754,247	12,275,198	14,028,208
Iron pyrites	7,661	2,557	...	10,238	12,279
Lead ore	...	26,970	1,006	27,976	32,010
Limestone (other than chalk)	27,715	512,158	10,640,706	11,180,579	11,905,477
Manganese ore	...	1,646	...	1,646	1,362
Mica	...	...	3,165	3,165	...
Ochre, umber, etc	...	5,228	9,314	14,542	15,200
Oil shale	2,354,356	...	...	2,354,356	2,282,221
Petroleum	8	...	...	8	...
Phosphate of lime	...	...	79	79	620
Rock salt	...	151,348	...	151,348	159,860
Salt from brine	...	...	1,631,708	1,631,708	1,701,487
Sandstone	91,254	230,604	4,793,817	5,115,675	5,019,874
Slate and slate slabs	...	154,324	334,448	488,772	585,859
Sulphate of strontia	...	...	16,651	16,651	9,121
Tin ore (dressed)	...	6,542	746	7,288	6,800
Uranium ore	...	79	...	79	41
Wolfram	...	18	3	21	9
Zinc ore	...	23,752	...	23,752	24,675

The important changes shown last year were both decreases; one of 6,134,355 tons, or 2.7 per cent, in coal, and one of 1,753,010 tons, or 12.5 per cent, in iron ore.

The report says: "The total number of persons employed in and about all the mines of the United Kingdom was 839,178, of whom 806,735 worked at the 3,397 mines under the Coal Mines Act, and 32,443 at the 731 mines under the Matalliferous Mines Act. Compared with 1900 there is an increase of 26,683 persons at the mines under the Coal Mines Act, and a decrease of 2,022 persons at the mines under the Metalliferous Mines Act. Of the 806,735 persons working at the mines under the Coal Mines Act, 647,822, or over 80 per cent, were employed below ground. Of the 158,913 surface workers, 5,195 or nearly 3.3 per cent, were females. There is an increase of 387 females compared with 1900. At the mines under the Metalliferous Mines Act, 18,804 persons, or nearly 58 per cent, worked below ground, and of the 13,639 surface workers, 393, or nearly 2.9 per cent, were females.

"At the quarries under the Quarries Act there were 94,188 persons employed, of whom 59,968 worked inside the actual pits or excavations, and 34,220 outside. Compared with 1900, there is a decrease of 663 among the inside workers, and an increase of 956 among the outside workers, making a net increase of 293 in the number of persons employed at the quarries. The persons employed occasionally at quarries are not included in the above figures.

"At the mines under the Coal Mines Act there were 951 separate fatal accidents, causing 1,101 deaths. Compared with 1900 there is a decrease of 11 in the number of accidents and an increase of 89 in the number of deaths. At the mines under the Metalliferous Mines Act there were 27 fatal accidents, which caused 30 deaths. Compared with 1900, there is a decrease of 10 in the number of accidents and a decrease of 8 in the number of deaths.

"At the quarries under the Quarries Act there were 97 fatal accidents, which resulted in 98 deaths. Compared with 1900 there is a decrease of 27 in the number of accidents and a decrease of 29 in the number of deaths.

"The number of non-fatal accidents reported during the year amounted to 3,747 at mines under the Coal Mines Act, 248 at mines under the Metalliferous Mines Act, and 1,037 at quarries under the Quarries Act. These figures are no guide to the number of non-fatal accidents which actually occurred; because the standard of severity governing the notification of accidents at mines and quarries is vague, and allows much latitude to the agent in his interpretation of it. The standard at mines and quarries is totally different from that at factories and workshops. What is wanted is one definite standard for all industries. Until such a standard is fixed by the statute no stress should be laid on these figures, excepting as regards injuries caused by explosions of firedamp, explosives and steam boilers; in these three cases notifications have to be sent to the Inspector, no matter how slight the injuries.

"The death rate of the underground workers at the mines under the Coal Mines Act was 1.46 per 1,000 persons employed, and therefore slightly higher than in 1900, when it was 1.44; the death rate of the surface workers was 0.95 per 1,000 employed, as against 0.73 for the previous year. The death rate of the underground and surface workers as a whole was 1.36, while that of 1900 was 1.30. At the mines under the Metalliferous Mines Act, the death rate of the underground workers was 1.49 per 1,000 persons employed, and of the surface workers 0.15 per 1,000. The corresponding figures for 1900 were 1.60 and 0.42 respectively. The death rate of the underground and surface workers as a whole was 0.92, a figure decidedly lower than that of 1900, which was 1.10. At the quarries under the Quarries Act, the death rate from accidents of workers inside the actual pits or excavations was 1.43 per 1,000 and of the persons employed at factories and workshops outside the quarries, but connected with them, 0.35 per 1,000. The corresponding figures for 1900 were 1.90 and 0.36 respectively. The death rate of the inside and outside workers as a whole was 1.04 per thousand in 1901, as against 1.35 in the previous year."

IRON ORE IN ELBA.—According to a recent British consular report the exports of iron ore from the Island of Elba have been as follows for two years past, in long tons:

	1900.	1901.	Changes.
Great Britain	89,216	66,802	D. 22,414
Germany	45,810	41,816	D. 3,994
Italy	40,225	15,700	D. 24,525
France	11,770	13,296	I. 1,526
United States	13,967	...	D. 13,967
Totals	200,988	137,614	D. 63,374

No ore was shipped to the United States last year. The concession under which the mines of Elba are operated permits the shipment of 200,000 tons of first-class ore and 50,000 tons of second-class ore yearly.

CHINESE RULES AND REGULATIONS FOR MINING.

Under date of April 4, 1902, Minister E. H. Conger, of Pekin, sends to the State Department a copy of the new rules and regulations for mining sanctioned by the Chinese Government, as given below:

1. All persons intending to engage in mining, whether with native shareholders or by borrowing foreign capital, must first of all clearly petition the Foreign Office and present the petition in person, or request the viceroy or governor of their respective provinces to forward their application to this board, and await an official reply. Whenever permission to mine is given, a certificate will be granted, without which no mining operations can be undertaken.

2. When such applications are approved by the Foreign Office, that office will refer the application to the bureau of mines and railways for approval. On receiving from the head office a reply in the affirmative, the Foreign Office will advise the bureau of mines and railways to issue a permit, after receipt of which mining operations may be commenced. Fees for such permits will be charged at the rate of 1 per cent on the capital, which must be paid to that bureau for office expenses.

3. The applicant who originally applies for a permit for mining must himself carry on the matter; he can not sell it to someone else. [It is not transferable.] In case he desires to sell out before or after he has begun operation, the original applicant must, with the transferee, apply again to the Foreign Office, according to articles 1 and 2, and put the matter on record. When this has been complied with, then the transfer can be made.

4. If the owner of the land cannot come to terms with the mining parties, the original petitioner should first parley with him, agree on a price, and have it recorded. It should not be a private (or secret) transaction. If, for Government reasons, the land should be mined and the owner of the land is obstreperous, he should be made to yield to the wishes of the Government. In such a case, the officials shall pay the owner a reasonable price, so that mining can be begun at will.

5. Applicants for concessions may be Chinese or foreigners, or Chinese and foreigners in partnership; it makes no difference. But the land being Chinese soil, and permission to mine being granted by the Chinese Government, it behooves all who undertake mining operations to respect and abide by the rules and regulations of this Government. If trouble of any kind arise, the Chinese Government can use its sovereignty to make a settlement.

6. According to the valuation of the vein opened a tax must be paid, as follows:

On 100 taels' ($68) worth of coal, iron, antimony, alum, borax, etc., 5 taels ($3.40), or 5 per cent.

On petroleum, copper, lead, tin, sulphur, cinnabar, etc., 10 per cent.

On gold, silver, spelter, quicksilver, etc., 15 per cent.

On diamonds, crystals, etc., 25 per cent.

Ores which are not included in the above list shall pay a tax according to the nearest mineral mentioned.

There is still to be an export duty at the treaty ports, but no "likin." The above amount is to form a distance revenue, for which the customs are to open a separate account.

7. Every company receiving a permit must begin work within 12 months. After that limit the permit will be canceled and a new concession given. The fact will be advertised in all the native and foreign papers.

8. A railway for transport may be built from the mine to the nearest port or to the nearest trunk line.

9. A mining school shall be started near to the mine, the expense to be borne by the company.

10. All materials and mining machinery from abroad shall pay an import duty only at the port; there shall be no likin. Whatever material is procured inland shall be given a free transport pass, if it is found to be really for use at the mines. But smuggling of any kind will be heavily fined.

11. The company must report to the Foreign Office when mining engineers are engaged, so that word can be sent to the viceroys and governors to instruct the local authorities to give them adequate protection. In case of trouble the local authorities will be held responsible. In disturbances caused through the purchase of land, opening a mine, or by the workmen, the local officials must issue a proclamation and restore order. If any malpractice is discovered they will surely be impeached and no leniency will be shown.

12. Mining land belonging to the people may be purchased at the market value, but Government land must be leased. The new owner shall pay a land tax, as is customary. Only land needed for sinking shafts or other mining purposes shall be occupied.

13. In buying land the company must pay a fair price, and not appropriate the land by force! nor must the owners raise their price in excess. Putting obstructions in the way on account of "feng-shui," etc., will not be allowed. In case the owner prefers to take shares rather than money for his land, this may be done.

14. Houses and graves are to be avoided. But if the land to be mined has houses or graves on it, the original owner should be well compensated and a removal effected.

15. There should be Chinese police to guard the mines, the expenses to be met by the company. Foreigners should have charge of the machinery and accounts, but all other employees should, as far as possible, be Chinese, and should be well paid. In case of accident to the workmen in the mines, their families should be compensated.

16. Chinese who have studied mining abroad, or who are merchants abroad and wish to invest in mines in China, may report to the Foreign Office. Students who are successful in prospecting will be recommended for imperial honors.

17. Those investing money in mining will be protected, but the Government will not be responsible for losses, nor for money borrowed from foreigners. Let the merchant borrow from some other merchant to repay the foreigners. It is no concern of the Government.

18. Accounts must be made up each year, and of the net gain 25 per cent shall be paid as royalty to the Chinese Government.

19. All companies having already received concessions or begun work may follow their regulations, except in article 6 of the present rules. New companies must adhere to these rules.

In acknowledging the receipt of these regulations, Minister Conger regrets that the probability is that instead of encouraging the development of the mineral resources of China, and thus bringing profit to the Government and people, the regulations will prove so difficult and onerous as to result in a practical prohibition of all substantial mining development.

PAYING OIL WELLS.—In reply to the question of what constitutes a "paying well," Judge Jones, of Washington County, Ohio, who has gained a reputation in settling disputes over oil leases, says: "Operators differ very much in regard to the term a 'paying well,' and the matter has often to be determined by circumstances that makes all the difference in the world. If there is sufficient gas in the field to furnish fuel for drilling and pumping wells, a well that makes as little as half a barrel a day would be a paying well. I don't mean by that that it would pay to put down such a well, but if they are once put down they can then be pumped on a production of half a barrel or even less. I had a case last year in Washington County that involved the question of what is a paying well, and some expert oil men testified that under favorable circumstances one-quarter of a barrel of oil would pay for pumping. But that is only where a number of wells are close enough together to be operated by one engine. It sometimes happens that a number of test wells are put down at no great distance apart, and all turned out small, but they are rigged up together by wires and operated by one engine at a central point. But oil men won't usually drill (unless merely to test territory) where wells make less than 8 or 10 barrels. The cost of putting down the well as well as the cost of pumping afterward must be taken into consideration."

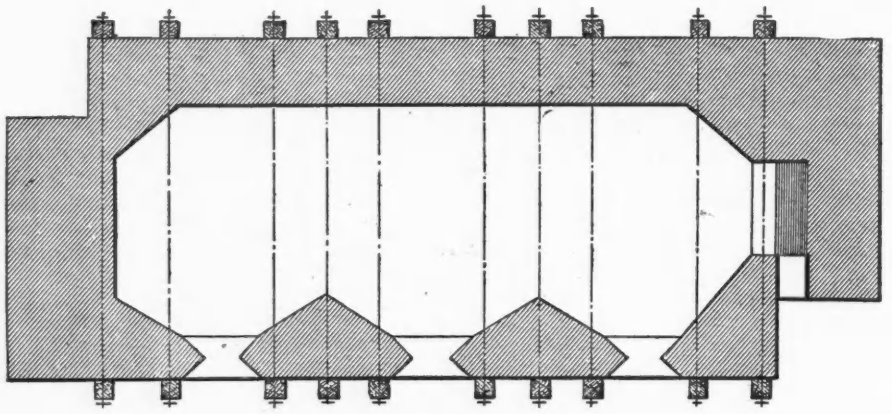
AN ADOBE REVERBERATORY FURNACE.*

By JOHN GROSS

In isolated mining camps the metallurgist must often use makeshifts. In Mexico one of the most important of these is the adobe, which has been used from prehistoric times. It is quite possible to erect a serviceable reverberatory furnace with no other materials than adobe, stones and wood. Such a furnace can be erected at a low cost, will give good results and last a long time. The present paper describes the construction of such a furnace.

The material being simply sun-dried, the construction must be quite heavy. The adobes should be evenly made, with just enough straw to hold them together, and not too large in size; 9 inches wide, 18 inches long and 4 inches thick is a convenient size. The binding material should be of the same clay as the adobes.

Fig. 1



ADOBE REVERBERATORY FURNACE.

The drawings explain themselves. Fig. 1 is a ground plan through the lower hearths; Fig. 2 a longitudinal section; and Fig. 3 a cross section.

The furnace is double-decked, with three hearths on each deck and an auxiliary fireplace for the upper deck. It is designed for wood firing and chloridizing roasting, and is operated entirely by manual labor.

The ore is charged through a hole in the roof, worked in charges of 1,200 kilograms, and finally drawn through the last rabbling door into wheelbarrows, to go to the cooling-floor.

Naturally, different ores and conditions would suggest other modes of building and manipulation; but the object of this paper is simply to show this particular furnace as it is.

The hearths are 10 by 10 feet in size, with 3-foot walls, making the furnace 16 feet wide and some 41 feet long. The arch springs 9 inches above the hearth floor, and has a 12-inch rise.

The foundation is of stone, well built on a solid footing, and carried up to the first set of buckstay rods. These 1-inch iron rods are placed in pipes or channels, to prevent them burning out, and to permit them to be easily changed if necessary.

The outside walls of adobe are now built up to the top of the lower skewback, when the floor of the hearth, which consists of a fire-stone set in clay, is put in. Each hearth is stepped a few inches lower than the preceding one.

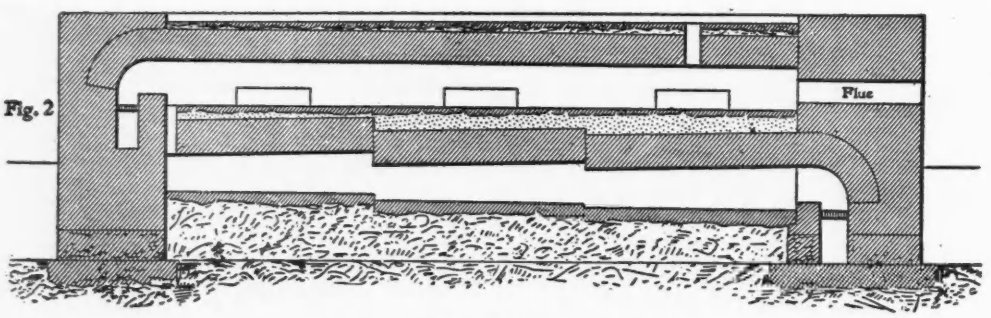
The center (of dirt) for the arch is now put in, and curved to templates. A 10-foot span of arch should not have less than 12 inches rise. When the center has been satisfactorily placed the skewback is cut, and the arch is built of arch adobes, placed upright, and making an 18-inch arch. This arch should be carefully built, using as little mud (made from the screened clay) for joints as possible, and hammering adobes in place with a block of wood.

After the arch has been well keyed, the middle buck-stay rods of 1-inch iron are placed in pipes just over it, and the walls are carried up to the top of the skewback of the upper arch; the upper hearth floor is put in; the center is placed as before; and the upper arch is built of the same size as the lower one. The upper rods of 1-inch iron, just over the upper arch, need not be put in pipes, though it is convenient to do so. The top of the furnace is paved with flagstones. The buckstays of 10 by 10-inch timbers are now put on; the rods are tightened thoroughly; and the centers are removed by boys getting into the furnace through the fire-box, after it has been cleaned out.

A light fire is started and kept going one day in the lower fire-box, and then in the auxiliary one, the lower fire being increased. After three days of gradually increased firing—during which time steam and water are likely to appear in a few cracks, and the rods are occasionally tightened—a charge of ore is put on each hearth. The sulphur, soon igniting, will, with proper firing, bring the furnace in a day or two up to a temperature sufficient to begin operations. Some 4 or 5 days more are required, however, before the furnace is properly heated, owing to the enormous body of adobe work that must be brought up to proper temperature.

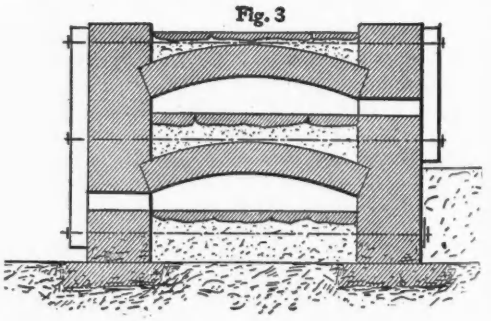
The rods must be looked after to see that they are kept tight; or if they burn out, they must be replaced. The great weight of the arches will cause their gradual sinking, if they are not properly held; but they sink very slowly and give abundant notice.

Fig. 2



ADOBE REVERBERATORY FURNACE.

Fig. 3



ADOBE REVERBERATORY FURNACE.

*Paper read before the American Institute of Mining Engineers, Philadelphia.

PETROLEUM IN UPPER BURMA.—*Indian Engineering* says: "Dr. Noetling of the Geological Survey, who visited Yenangyoung about six years ago, gave the opinion in his report that the supply would in all probability run out in a very few years. Since then the supply at Yenangyoung and Yenangyat has very nearly doubled, and there seems to be no indication of an early exhaustion of oil in Upper Burma at present."

PRODUCTION OF IRON ORE IN THE UNITED STATES IN 1901.

The production of iron ores in the United States during the year 1901, as given by Mr. John Birkinbine,[1] amounted to 28,887,479 long tons as compared with 27,553,161 long tons in 1900, a gain of 1,334,318 tons or 5 per cent; the gain of 1901 over 1898 was 9,453,763 tons, or 49 per cent, a phenomenal growth. The total value at the mines of the ore mined in 1901, as reported to this office, was $49,256,245, or a mean value of $1.71 per ton, an apparent decrease of 71 cents, or 29 per cent, from the 1900 figures of $2.42 per ton. The value of the iron ores mined in 1900 was $66,590,504. The largest amounts of iron ores officially reported to date, from any other countries, are 18,667,950 long tons, mined in Germany and Luxemburg in 1900, and 18,031,957 long tons mined in Great Britain in 1882.

Twenty-five States and one Territory mined iron ore in the year 1901, the number remaining the same as in 1900, Utah dropping out and South Carolina taking its place. As in the year 1900, Minnesota contributed the greater portion of the increase for 1901 and advanced to first place as a producer, Michigan, which has uninterruptedly occupied this position since the year 1881, now being second.

New exploitations for standard ores in the Lake Superior district are being actively carried on, and in addition, some siliceous and lower grade ores, of which large quantities exist, are liberally exploited. In the central west, valuable deposits of iron ore in Wyoming, Colorado, and New Mexico are being worked extensively to supply the Colorado furnaces. On the Pacific Coast, the Irondale furnace in Washington has resumed operations, but its principal reliance so far has been on the magnetite deposits of Texada Island, in British Columbia.

In 1901 the hematite mines contributed 24,006,025 long tons, or 83.10 per cent of the total for the United States, an increase of 6 per cent over the 1900 total. Minnesota was the largest producer of this class of ore, followed by Michigan and Alabama. The total brown ore mined was 3,016,715 long tons, or 10.44 per cent of the output of the country, a decrease of 7 per cent from the 1900 record. Virginia and West Virginia, combined, led as a brown ore producer, followed by Alabama, and Tennessee. Of magnetic ores, 1,813,076 long tons, of 6.28 per cent of the United States total, were mined in the year 1901, an increase of 18 per cent over the total for 1900. Pennsylvania was the principal contributor, followed by New Jersey and New York. Only 51,663 long tons of carbonate iron ore was mined in 1901, being 0.18 per cent of the total iron ore output for the year. Practically all of this came from Ohio, although Maryland, New York, and Pennsylvania contributed small amounts.

The greater part of the iron ore in the United States continues to be supplied by the Lake Superior region, which produced its maximum output of 21,445,903 long tons in 1901, being 74 per cent of the total quantity reported and an increase of 4 per cent over the total for 1900.

ELIMINATION OF SILICON IN OPEN-HEARTH STEEL MAKING.

At the recent meeting of the Iron and Steel Institute in London, a paper by Mr. Andrew McWilliam, lecturer in metallurgy at University College, Sheffield, and Mr. William H. Hatfield, of the Meadowhall Iron and Steel Works, Sheffield, entitled the "Elimination of Silicon in the Acid Open-Hearth," was read. The authors pointed out that in the manufacture of steels of widely varying carbons occasional heats containing more silicon than was desired or expected would occur. Uniformly low silicons are now fashionable in some quarters. It has been thought that what is called a "sand boil" may have occasioned high silicons, or there may have been a special attack on the bottoms or banks of the furnace where the silica has been reduced to silicon, and transferred to the steel. Messrs. J. Crowley & Co. having placed at the disposal of the authors a 25-ton furnace, investigation was commenced. The carbon contents of the steels made were very varied, and the condition of the bottom and banks after the metal was tapped was tabulated alongside the corresponding percentages of silicons in the steels. It was found that the silicons were apparently quite independent of the other variations. The effect of varying temperature was next made the subject of study, but no clear indication was found of any predominating effect. Next the condition of the slag and its composition were considered, and here, it appeared, was the crux of the whole question. Analyses showed that the steels finished with thin slags were low in silicon, whilst those with thick slags were high. This condition could be varied at will. The proportion of ferric oxide to ferrous oxide, and the total amounts of oxides in the slag within the limits of experiment, seem to be of subsidiary importance, excepting that they help to determine the basicity of the slag.

The discussion on this paper was opened by Mr. Windsor-Richards, who said that the results obtained by the authors were surprising. That silicon could be kept under perfect control was shown by experiments he had made.

Professor Bauerman congratulated the authors on their excellent paper, and said its value was greater because they had told us something we might have anticipated. The ordinary process of "killing" steel was analogous to that which had been described, but the experiments were extremely interesting as having been carried out on so large a scale. He thought Mr. McWilliam had proved his point.

Mr. Harbord had been trying to gain information on this matter for some time past. He agreed that the slag influenced the content of silicon, but he thought that it would be better to say that the condition depended both on the composition of the slag and the temperature.

[1] *Mineral Resources of the United States*, 1901, now in press, United States Geological Survey.

THE LOSSES OF SILVER IN CUPELLING WITH VARYING AMOUNTS OF LEAD AND SILVER.

By W. H. Kauffman.

The literature on the subject of silver losses in cupellation being very slight it seemed desirable to make a series of experiments to determine what losses were sustained under the following conditions:

1. With the same amounts of silver and varying amounts of lead.
2. With varying amounts of silver, from 25 to 200 milligrams.
3. The influence of copper on the results.
4. The influence of varying temperatures.
5. The influence of various grades of cupels.

The cupels were made with an automatic machine. The first batch was made from 3,000 grams of bone ash, with the addition of 393 c. c. of water. These may be called "water" cupels. The second batch was made with the same proportions of bone ash and water, 60 grams of pearl ash being dissolved in the water used for mixing. We shall call these "potash" cupels.

The third batch contains 20 grams of borax, in place of the pearl ash, and may be designated as "borax" cupels. The water cupels were somewhat soft; the potash and borax cupels were fairly hard.

The lead foil used in the experiments was free from silver; 100 grams on successive scorification and cuppellation gave no trace of silver. The results obtained are arranged in the following table; the percentage loss of silver on the amount of silver used being given.

In order to distinguish variations in temperature reliance had to be placed on the appearance of feather litharge, as no pyrometer was available. Feathering is not an absolute indication of low temperature, as it is considerably influenced by the position of the cupels in the muffle, and from the results it is evident that unfeathered cupels frequently give smaller losses than feathered ones. But, as a rule, feathered buttons show the smallest losses.

In the following tables buttons, marked "F," have been well feathered; that is, there were two or three rows of feather litharge. Those not so marked have been but slightly feathered, or not at all. Buttons that have been subjected to an excessively high temperature are marked with an asterisk. In computing averages, buttons that have been cupelled at an excessive temperature, or show abnormally high losses, are omitted; they are enclosed in parentheses in the tables.

PERCENTAGE LOSS OF SILVER.

WATER CUPELS.

	Lead, 5 grams.	Lead, 10 grams.	Lead, 15 grams.	Lead, 25 grams.
Silver, 25 mgms....	2.04 F.	2.38	2.67	2.00 F.
	2.24 F.	2.64 F.	2.83 F.	2.18 F.
	....	2.86 F.	2.57 F.	....
Average loss, %.....	2.14	2.63	2.69	2.09
Silver, 50 mgms.....	1.41 F.	2.19 F.	2.07	(3.00)*
	1.34 F.	2.05 F.	2.13	1.79 F.
	1.55 F.	2.52 F.	2.18	2.24 F.
	....	2.18	2.23	1.94
	....	....	2.09 F.	....
	....	....	2.11 F.	....
Average loss, %.....	1.43	2.23	2.14	1.86
Silver, 100 mgms...	(1.87)	1.62 F.	1.62 F.	(2.55)*
	(1.81)	1.60 F.	1.73 F.	2.04
	(1.86)	...	...	2.23 F.
	1.26 F.	....	....	2.10 F.
	1.34 F.	....	....	....
Average loss, %.....	1.30	1.61	1.68	2.12
Silver, 200 mgms....	1.00 F.	1.34 F.	1.63 F.	1.75 F.
	0.62 F.	1.23 F.	1.26 F.	1.77
	0.96 F.	1.15 F.	1.32 F.	1.70
Average loss, %.....	0.86	1.24	1.40	1.74

II.—POTASH CUPELS.

	Lead, 10 grams.	Lead, 25 grams.
Silver, 25 mgms.....	(3.05)	2.76 F.
	2.23 F.	(3.34)*
	2.57	(3.36)*
	2.35 F.	2.09 F.
	(2.78)	2.60 F.
Average loss, %.....	2.38	2.48
Silver, 50 mgms.....	2.00 F.	2.25 F.
	2.12	(2.63)
	2.33	(2.80)
	1.99 F.	....
	2.07 F.	....
Average loss, %.....	2.10	2.25
Silver, 100 mgms.....	(2.20)	1.96
	1.76 F.	1.90
	1.91 F.	(2.40)
Average loss, %.....	1.82	1.93
Silver, 200 mgms.....	1.21 F.	1.46 F.
	1.26 F.	(1.76)
	1.39 F.	(1.89)
Average loss, %.....	1.29	1.46

III.—BORAX CUPELS.

	Lead, 10 grams.	Lead, 25 grams.
Silver, 25 mgms.....	(2.77)	(4.13)*
	2.44 F.	(4.45)*
	2.56	2.25 F.
	2.28 F.	2.63 F.
Average loss, %.....	2.43	2.44
Silver, 50 mgms.....	2.05 F.	(2.97)*
	1.97 F.	(3.00)*
	1.87 F.	2.37
Average loss, %.....	1.96	2.37
Silver, 100 mgms.....	1.49 F.	2.13
	1.38 F.	2.14 F.
	1.40 F.	2.09 F.
Average loss, %.....	1.42	2.12
Silver, 200 mgms.....	1.28 F.	1.77 F.
	1.03 F.	1.62 F.
	1.19 F.	1.86 F.
Average loss, %.....	1.17	1.76

INFLUENCE OF COPPER ON LOSSES, 100 MGMS. SILVER USED.

(WATER CUPELS.)

	Lead, 10 grams.	Lead, 25 grams.
Copper, 20 mgms.....	(1.95)	1.87 F.
	(2.25)*	1.76 F.
	1.61 F.	(2.50)*
Average loss, %.....	1.61	1.82
Copper, 50 mgms.....	(2.08)*	2.08 F.
	(2.09)*	(2.44)
	1.80 F.	1.93 F.
Average loss, %.....	1.80	1.99
Copper, 100 mgms.....	1.66 F.	2.01 F.
	1.96	(2.19)
	2.01 F.	....
Average loss, %.....	1.87	2.01

A careful study of these results shows some

rather large variations in losses, even where the conditions of cupellation are apparently the same. It is evident that these variations are due to differences in temperature. Small differences that cannot be detected by the eye cause surprising differences in the results. An excessive heat will cause greater losses than any other variation in the conditions of cupellation.

But in spite of these differences the following conclusions can be drawn from the results obtained:

1. The percentage loss of silver is greater in cupelling small amounts of silver than when larger amounts are cupelled.

2. The loss is appreciably greater when the lead button weighs 25 grams than when it weighs but 5 grams, except in the case of the 25 milligram silver button. With 10 and 15 gram buttons the losses are generally smaller than with 25 gram buttons, and larger, than with 5 gram buttons.

3. Similar conclusions can be drawn regarding buttons contaning small amounts of copper; the losses are not increased by the presence of copper up to 100 milligrams.

4. With potash and borax cupels the losses are in general the same as when water cupels are used.

5. Excessive heat causes greater losses than large amounts of lead.

6. The smallest losses occur when a small lead button is cupelled at a low temperature.

THE INTERNATIONAL NAVIGATION CONGRESS.—The works of eminent engineers, political economists, and learned men, treating questions, partly of an economic, partly of a technical nature, and written for the ninth International Navigation Congress, which will take place in Dusseldorf from June 29 to July 5, are to be published. The majority of these treatises, about 100 in number, will be printed in three languages—German, French and English—and sent to every member registered at the Congress.

An English company has been formed for the development of the petroleum industry in Greece. Some few years ago the Greek Government decided to make experiments on their own account before granting the concession to foreigners. This work was commenced, and borings to a depth of 100 meters were made, but the drills were broken on a hard bed of rock, and the undertaking consequently abandoned. Nevertheless, the substances extracted from the bore-holes were chemically examined and found to contain petroleum.

THE MANUFACTURE OF COKE FROM COMPRESSED FUEL.*

By JOHN H. DARBY.

It will probably be admitted that the best coking coals on the Continent, and also those of Great Britain, have for years past been getting scarcer, and various devices have been employed to improve the quality of the resulting coke when made from inferior seams. A few years ago several works, chiefly in the Saarbrucken district, came under the author's notice, where a systematic attempt was being made to improve the quality of the coke by compressing the fuel before coking, and he was so impressed with the improved results obtained with poor coking fuels that he undertook experiments on the same lines. It is proposed in this paper to embody a short account of the results of these experiments, and the benefits derived. It may be said at once that the result of the trials made showed that the advantages of compression were by no means confined to the poorer coking fuels.

The idea of compressing fuel for coking purposes originated on the Continent, where many of the coals coked so indifferently that it was of the greatest importance to adopt any method that gave a prospect of improving the quality of the resulting coke. It had been observed that the coke produced from the lower portions of retort ovens, compressed by the weight of the superincumbent fuel, was superior to that produced from the upper portions of the charge, and this led to experiments in compressing the fuel by various means: first by stamping in the oven by hand, in other cases by weighing the charge; and from this the practice of compressing in a box outside the ovens was gradually evolved, the stamped cake being afterwards moved out of the box into the oven by mechanical means.

The results obtained show that the quality of the coke is distinctly improved by compression. Such improvement is naturally more marked in some fuels than others; but from a large number of trials made with many of the English fuels, the writer is able to say that he has not seen any instance in which the improvement made by compression has not been apparent. Indeed, he is aware of a case in which compressed coke is being sold in the open market at a substantial advance on coke previously made from similar uncompressed fuel. Even with the best coking fuels the results obtained seem to justify the outlay in equipping a plant for compressed fuel, as well as the special case in which it is essential that the fuel should be compressed in order to produce a marketable coke.

In reference to the apparatus employed, it is unnecessary to mention the machine in which stamping is done by hand, or to describe the earlier forms of mechanical stamps in use, and it will be sufficient to illustrate two of the later types.

The essential parts of the appliances used are the stamping machines and compression boxes. These can be combined in a variety of ways as the surroundings may demand. For example, there are the combinations, firstly, of a compression box and charger, built with a superstructure carrying the stamping machine; secondly, a compression box and charger with stationary stamping machine. The first combination may be described generally as suitable where the machine has to travel for a considerable distance and take its supply of slack for compressing at a number of stopping-places, stamping operations proceeding during the travelling of the machine. The second combination having a fixed point for the fuel supply, allows of the application of a fuel-feeding device as presently described, and offers opportunities for saving both time and labor. In fact, under favorable conditions this type of machine will compress and charge 50 ovens per 24 hours, and it is probable that this is not the limit of the modern machines. With both these types of machines, in many instances, a coke discharging ram may be conveniently combined with the compression box, in which case two men are able to control the operations of pushing the coke out of the oven and charging it with compressed fuel. The following is a description of these types:

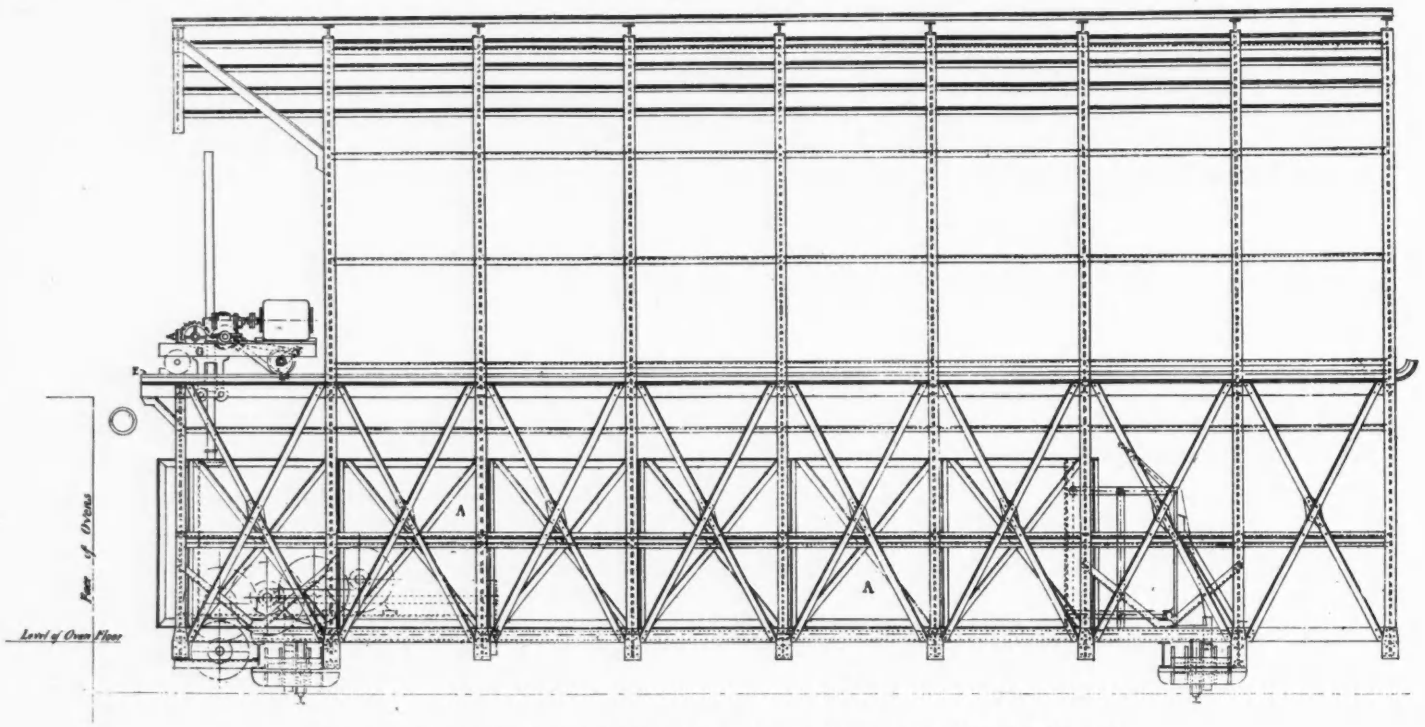


FIG. 1.—OVEN FOR COKE MAKING WITH COMPRESSED FUEL—SIDE ELEVATION.

Charger Carrying Stamping Machine.—This machine is illustrated in Figs. 1 and 2. The sides of the compression box A, which are strongly constructed of plates, angles and tees, having all rivets countersunk inside, are hinged at the bottom by hinges B, and are opened and closed at the top by a series of eccentrics C mounted on a continuous shaft worked by hand gear. The front of the box is closed by a hinged door opened when the fuel cake is ready for charging. The back of the box is a plate mounted upon and moving with the charging peel D and capable of being drawn back a limited distance by an arrangement of parallel levers. The bottom of the box is the charging peel, upon the back of which the fuel cake is stamped. It is a built-up section nearly the same width as the oven by about 4½ inches thick, containing on its under side a steel rack and moving in guides upon a series of turned rollers.

*Abstract of paper read before the Iron and Steel Institute. London, May, 1902.

The mode of operation is as follows: the sides of the box are closed and adjusted to suit the width of the oven to be charged, and the front and back plates are fixed in position. The fuel is then run into the box and stamped in layers as will be described presently, and when the fuel cake is ready the machine is moved up to the oven to be charged. When in position and the oven door opened, the front door of the box is swung back and the sides of the box eased by turning the eccentrics C. The rack is then put in motion, the back plate acting as a thrust-plate, and the cake served into the oven. The back plate is then drawn back by the parallel levers, the oven door closed and made fast and the peel withdrawn, the oven door holding in the cake meanwhile. When the peel is quite withdrawn, the oven door is permanently fastened and luted. No alteration in existing oven doors is necessary when they are of the lifting type, but when they are of the hinged type a small separate opening, called the peel door, has to be fitted to them. The machine now moves off to receive a fresh charge of fuel.

In the machine illustrated the ordinary oven charging cars are wheeled off the top of the ovens on to the top of platform E, and are discharged over the sloping apron F direct into the compression box as required. When there is sufficient head-room, the apron F may be converted into a bunker or hopper containing enough fuel for another charge in addition to that stamped within the box. The transfer from the oven tracks to the charging machine may be at any number of points by means of turn-tables, the gap between the face of the ovens and the machine being spanned by an overhung track.

Over the top of the compression box is the stamping machine G, mounted on four wheels and traveling on a track the whole length of the box. The stamping machine is a steel-framed structure carrying an electric motor, worm-wheel reducing gear, lifting and releasing rollers for the stamping motion, and traveling gear for moving the machine along the length of the compression box and back. The stamping head is mounted upon a long wooden shaft, and on every upstroke the travel motion comes into action.

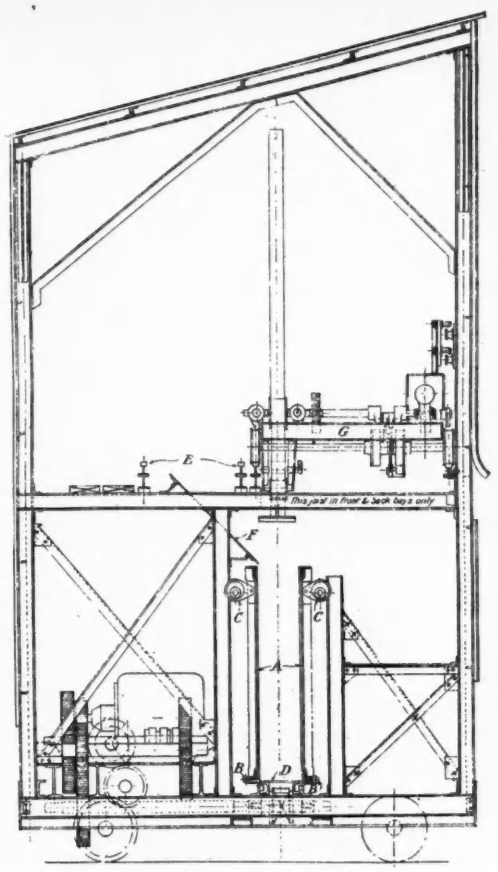


FIG. 2.—END ELEVATION.

The fuel is served into the box and stamped in successive layers about 18 inches deep, the time occupied for this operation being from 15 to 25 minutes, according to the size of the oven.

The superstructure, with tub track and platform, stamping machine and track, and fuel-apron or bunker, is carried by a strong braced underframe of rolled joists mounted upon four wheels traveling on tracks up and down the face of the ovens at 300 feet per minute. On one side of the compression box is a platform for the attendant, and on the other is placed the motor and gearing for driving the peel and travel of the machine. On the platform are assembled the switch and controlling levers.

Charger with Fixed Stamping Machine and Fuel-feeding Device.—Figs. 3, 4 and 5 show the general arrangement of this machine, the compression box being in position for stamping. The box A, underframing the attendant's platform, are on the same lines as the last machine described, but there is no superstructure, and the charging machine is combined with a coke-pushing ram. The stamping machine G moves on girders spanning the ram race, and instead of carrying its own motor is driven through sliding bevel gear from a constant running shaft H with tumbler bearings, and driven by a motor mounted upon the girders. The controlling gear of the stamping machine admits of the stamping and traveling motions being varied or stopped without stopping the motor.

The fuel is delivered into the compression box over the apron F. Above the apron is a scraper conveyor J, driven from the shaft H and stopped and started by a clutch. The conveyor trough K is movable, being built independently of the conveyor framing, and mounted on wheels moving on a track. This trough is also driven by the shaft H by means of a rack and pinion underneath the trough, and it is stopped, started and reversed by clutch. The clutch levers referred to in each case are accessible from the platform of the charger. Fuel is fed into the trough from an elevator L, or other device.

The method of working is as follows: the travel of the trough K is the same length as the cake to be stamped, and its speed is equal to the speed of the travel of the stamping machine. The elevator L being started delivers the fuel into the trough, and the scrapers of conveyor J, which run considerably faster than the trough, carry the fuel over the end of the trough, and spill it on to the apron F, over which it falls into the compression box. The trough is travelled the length of the box in advance of the stamping machine, delivering the fuel in a constant stream in its course, and having reached the end of the box is reversed when the stamping machine is reversed, thus moving backwards and forwards until the fuel charge is completed.

This machine has the advantage over that illustrated in Figs. 1 and 2 in that it delivers a constant and continuous supply of fuel from start to finish. The stamp has not to be stopped, as in that design, in order to allow of a fresh layer of fuel being introduced and levelled, and the saving of time is there-

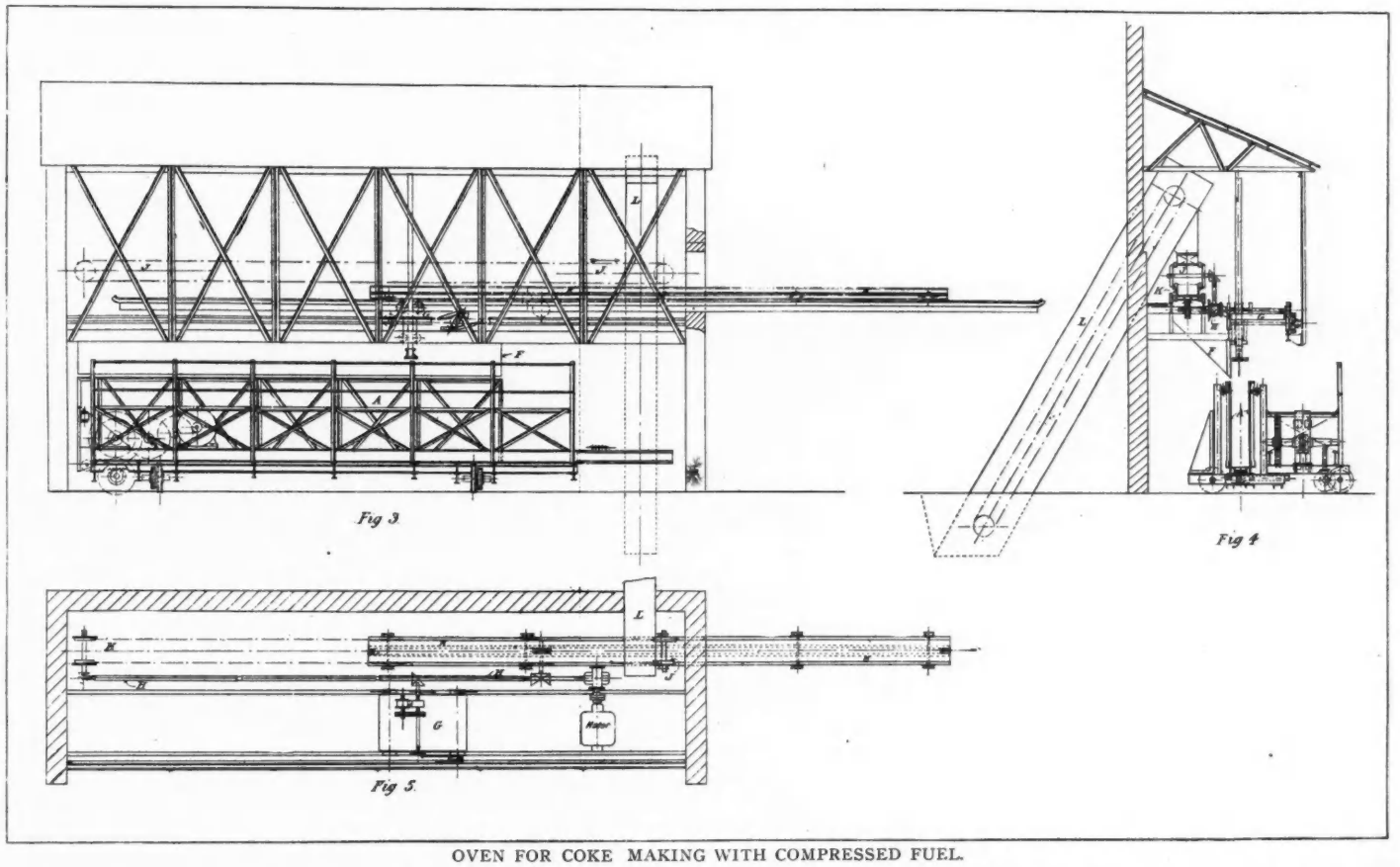


Fig 5.

OVEN FOR COKE MAKING WITH COMPRESSED FUEL.

fore considerable. When suitable arrangements are made no tubmen are necessary, and the two charging machine attendants are the only men required.

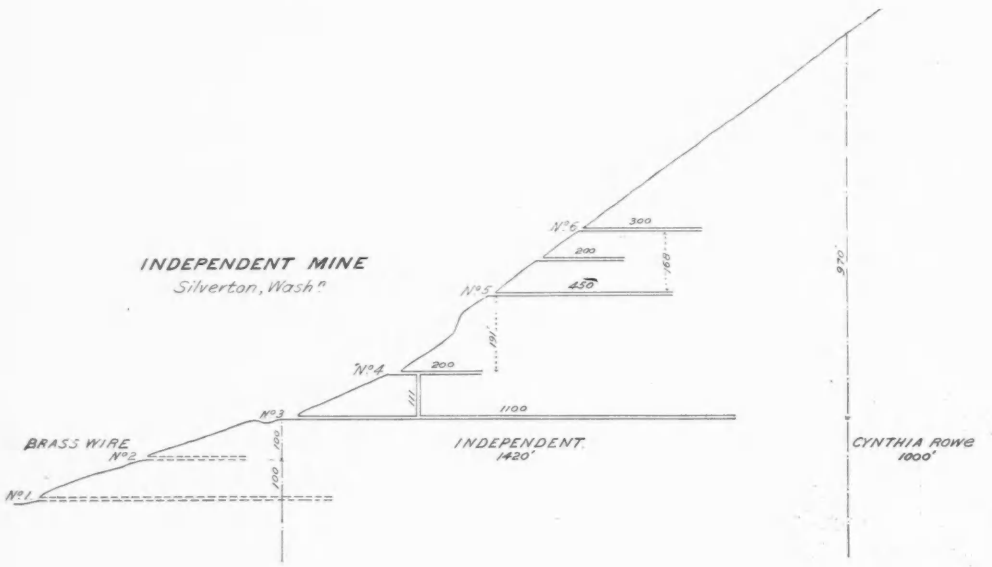
THE INDEPENDENT MINE AT SILVERTON, SNOHOMISH CO., WASHINGTON.

By R. H. STRETCH.

In the absence of literature on the mines of the Cascades in Western Washington, the readers of the ENGINEERING AND MINING JOURNAL may be interested in a short account of one which has passed out of the prospect stage, and may fairly take rank as a mine, being so far developed as to prove the permanence of the lode both in length and depth.

The lower tunnel of the mine is located 410 feet above the railroad track at Silverton, and a little more than three-quarters of a mile from the depot, while the vein can be opened at a depth of 2400 feet by a drift on the lode. The accompanying skeleton elevation of the vein on the line of its strike shows this fact and the location of the development work.

The vein follows an approximately east and west sheer plane in schistose rocks, lying on a granite base, which has not yet been encountered in the workings, and apparently at this point lies considerably below



the bed of Silver Creek. Owing to the sheeting of the rocks along this plane, they have been easily attacked by weathering influences, and the outcrop of the vein follows the narrow bed of a deep gorge, with very precipitous walls. This type is repeated in many other mines both at Silverton and Index, not only on sheer zones, but where the lode is governed by dikes which are softer than the vein walls, as in the Apex and Bonanza Queen mines. On the Independent mine the gorge has a general slope of about 38°, and a lineal extent from the crest of the hill to Silver Gulch of about 3,000 feet. The limited watershed furnishes but little water, and the mine is consequently nearly dry.

The present lower or No. 3 tunnel, is in a distance of some 1,100 feet following the vein, which is remarkably straight with a slight southerly dip, and a width ranging from 2 to 6 feet. Lateral work and cross-cuts show that two other more or less parallel lodes of workable width exist at this depth, within a zone 100 feet wide. One of these has been developed to a distance of 300 feet.

The extreme end of the tunnel is over 700 feet below the outcrop in the gulch, and in this vertical depth, four other tunnels have been run, as follows: No. 4, 200 feet long, 111 feet above No. 3; No. 5, 450 feet long, 191 feet above No. 4; No. 5½, 200 feet long, 80 feet above No. 5; No. 6, 300 feet long, 168 feet above No. 5; with some 3,000 feet development on ore, including upraises.

No. 6 is 470 feet vertically above No. 3. The excavations at the mouth of No. 5 show three veins within a zone 80 feet wide, which makes it probable that this structure will continue through the entire property.

The bed of the gulch is somewhat obscured by local masses of debris and fallen timber, but ahead of the extreme end of No. 6 there are two very long and wide outcrops visible in the remaining 1,400 feet belonging to the company. From the present lower level, the vertical depth at the east line of the Independent location, some 300 feet beyond the present face of the tunnel, is 970 feet, and at the end of the Cynthia Rowe location, also part of the same property, this will be increased to about 1,600, without counting the amount to be won by the projected lower tunnels No. 1 and 2. The available ground without hoisting works is therefore some 3,000 feet long by a vertical depth of about 1,800 feet.

The ore has a quartz gangue, but also penetrates the interlaminated schists, and consists of iron-pyrite, lollengite (an arsenopyrite low in sulphur), with a little galena and traces of blende in the best ores. The principal associate is gold, and little spots of realgar in the face of the lower tunnel show that there is a complete drainage of the lode below that depth. The amount of silver is small as compared with the gold.

While the bulk of the ore is a concentrating proposition of probably 10 or 12 to 1, there are bodies of shipping ore, in levels 6, 5½, 5, and between 4 and 3, with some undeveloped places in No. 4, which seem to be associated chiefly with the hanging wall. Taking the low grade ores by themselves at say $7 per ton, the high grade ores will run from $40 to $50 per ton, with assays up into the hundreds, especially where the lollengite is abundant, as this mineral seems to be very largely the gold bearer, not only in this but in numerous other mines of this series. In this term there are included some six or seven veins, practically parallel to the Independent, within a right angle distance to the strike of less than a mile, on all of which more or less development work has been done, and all of which show the same type of ore, broadly speaking, as they vary chiefly in the percentage of galena and blende, and occasional traces of chalcopyrite and ruby silver. The presence of copper may be taken as an indication of an approach to the underlying granite, as this mineral is characteristic of that rock in the Silvertone region. Bornite is notably absent.

The mine is equipped with an aerial tram from No. 5 to No. 3 tunnels; the outside tracks are snow shedded, and taken altogether few mining enterprises are better located for economical work. The owners are now preparing to install their concentration works of 100 to 200 tons capacity daily; the product will be sold to the smelter, only about 45 miles distant.

BRITISH PATENTS.—The applications received by the British Patent Office in 1901 numbered 26,777, showing a substantial increase over the years 1900 and 1899. Of the total, 17,813 were from the United Kingdom, 601 from other portions of the British Empire, and 8,363 from foreign countries. It is noteworthy that the United States is credited with 3,246, and Germany, 2,844, making together 73 per cent of the total foreign patents. The subject attracting most attention during the year was electric traction.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

DUTY ON BORATE OF MANGANESE.—Borate of manganese is properly dutiable as a borate material not otherwise provided for at the rates prescribed according to the percentage of anhydrous boracic acid contained in the material under the provisions of paragraph 11, act of July 24, 1897, and not as a chemical compound under the provisions of paragraph 3 of said act, the former being held the more specific provision and to include within its terms such merchandise.—Appeal of O. C. Hempstead & Son from Collector of Customs at Philadelphia; Board of General Appraisers.

DUTY ON CHARCOAL BAR IRON.—Bar iron enumerated in paragraph 123, act of 1897, in the manufacture of which charcoal has been used as a fuel, is dutiable at the rate of $12 per ton, as falling within the closing proviso to paragraph 124, said proviso being held to extend to both paragraphs 123 and 124.—United States v. A. Milon & Co.; United States Circuit Court, Southern District of New York.

LIABILITY FOR ACCIDENT IN COAL-MINING OPERATIONS.—Evidence that the passage where a mule driver in a mine was injured was the shortest road to the escapement shaft, although there was another longer road, is sufficient to go to the jury on the question of whether such place was a passageway communicating with the escapement shaft, or an exit from main hauling-ways to escapement shaft, which by the laws of Illinois are required to be of a certain height and width. In an action for the wilful violation of the act for the protection of miners, the question of the negligence of the miner does not enter into the case. The employer cannot delegate to another the duty of furnishing a safe place to work, so as to escape liability for neglect of such duty.—Spring Valley Coal Mining Company v. Rowatt (63 *Northeastern Reporter,* 649); Supreme Court of Illinois.

WHEN RECEIVER WILL NOT BE APPOINTED FOR MINING COMPANY.—The fact that the bondholders of a corporation owning coal lands permitted the interest to become in arrears for 17 years before bringing suit for foreclosure, with full knowledge of the operations of the company, during the last 2 years of which time it expended large sums in developing the property, may properly be considered in determining their equity to demand the appointment of a receiver; and the appointment ought not to be made, under such circumstances, against the opposition of the company and a majority of the bondholders, without clear proof that there was mismanagement, and that the receiver would better preserve the interests of the bondholders, and would be at least, necessary for their protection.—Romare v. Broken Arrow Coal and Mining Company. (114 *Federal Reporter,* 194); Circuit Court of the United States, District of Alabama.

STIPULATED DAMAGES FOR BREACH OF MINING LEASE.—A coal lease provided that the lessee should mine not less than a stated number of tons per year during the term, and should pay royalty on such number of tons, whether mined or not. The court said: The parties have stipulated upon the minimum sum to be paid each year for the right to mine; and this sum is, in my opinion, so clearly and distinctly liquidated damages, and not a penalty, that I shall not take time to discuss it. It is, I think, an annual rent, distinctly agreed upon, and must be paid, if, as I have found, the coal is merchantable, although no coal is actually mined. And where the lessee abandoned the lease before the end of the term without good cause, he was liable for damages in the sum so stipulated, without regard to the value to the lessor of the coal remaining in place.—Martin v. Berwind-White Coal Mining Company (114 *Federal Reporter* 553); United States Circuit Court, District of Pennsylvania.

MINE OPERATOR LIABLE FOR NEGLIGENCE OF FOREMAN.—Two miners were employed at the bottom of a shaft. There was an elevator in the shaft, and when about to blast they gave the signal to the engineer, who signified that he understood, by raising the bucket a few feet, and then lowering it. They then ignited the fuse, and signaled the engineer to hoist, and were raised a short distance and then lowered, and the engineer shouted down the shaft that the compressed air by which the elevator was raised was cut off. One of the miners climbed up the elevator and escaped; the other could not do so and was killed by the explosion. The air was cut off by the foreman, who had full charge of the operation of the mine. There had been an iron chain ladder in the shaft, which was removed some weeks before the accident to be replaced by a new chain ladder, which was on the ground, and was to be placed in the shaft that day. It was held that where a corporation owning two mining plants has a general superintendent, with general oversight over both plants, and a foreman of each mine, who employed and discharged the men, and who directed and controlled the entire operation of his mine and of the various gangs of men there employed, such foreman is a vice-principal, for whose acts and negligence in the conduct of such mine the owner is responsible.—Alaska United Gold Mining Company v. Muset (114 *Federal Reporter*, 66); United States Circuit Court of Appeals, District of Alaska.

ABSTRACTS OF OFFICIAL REPORTS.

Broken Hill Proprietary Company, New South Wales.

The latest report of this company is for the half-year ending November 30, 1901. The earnings from lead, silver, etc., sold were £473,664; ore and concentrates sold, £195,652; total, £669,316. The working expenses amounted to £599,756, leaving net earnings of £69,560. Sundry receipts were £2,901, making a total of £72,461. Charges were, for general expenses, £16,168; depreciation, £12,974; a total of £29,142, leaving a balance of £43,319. The dividends paid were £48,000, showing a deficit of £4,681. The surplus brought forward was £548,076; leaving a balance of £543,395 to the current half-year.

The report of General Manager G. D. Delprat says: "In the mine operations in the open-cuts have been continued as formerly. The extraction of the ore has been cheaper owing to the removal of the overburden having been well advanced during previous half-year. In Block 11 open-cut we are down to the 300-foot level, and a large quantity of sulphide ore is being quarried at this level. The inclined plane at MacGregor's has been pushed down to 30 feet below the 300 level, and the connection with the open-cut is finished. Operations underground during the period have not disclosed any new features. The opening up of the 650 and 800-foot levels is being pushed on vigorously, and in a short time it is expected to have the former level connected with Delprat shaft, and ready for stoping. The ore found in both these levels continues of good quality, and the diamond drill is carrying out useful work in defining the limits of the ore body. Delprat shaft is now 21 feet below the 650 level, and is in constant use for lowering men, horses, timbers, etc.

"The total extraction of ore for the half-year has been: From open-cut, 63,533 tons; from underground, 242,095; total, 305,628 tons, which shows an increase of about 9,000 tons over the previous half-year.

"The chloridizing and leaching plants were kept running for 4½ months only, when they were closed down, as the ore immediately available from the open-cuts was not of a suitable nature for this process. The two concentrating plants continued to do very good work, and again gave an increased recovery of metals at a reduced cost per ton. Various small modifications are being introduced, from time to time, as experience dictates. The slimes from the mill, which are difficult to deal with at the smelting works, are now being sintered at Broken Hill, and transformed into a good smelting material at a very low cost. It is probable that a site will be selected outside of the town of Broken Hill, in order to carry out the sintering operations on a large scale.

"Smelting operations continued at Port Pirie without interruption. The modifications in the design of the smelters, which on trial gave such satisfactory results, were introduced into eight furnaces, increasing the lead recovery very materially. Experiments are being made with a new roasting process, and an experimental plant was put up for this trial. So far no definite results have been obtained, and the experiments continue. The effects of a homogeneously good quality of iron ore for fluxing, which is now available from our Iron Knob property, was felt during the latter part of the half-year.

"The tonnage of ore, concentrates, etc., smelted has amounted to 105,255 tons, giving an average yield of: Lead, 18.6 per cent; silver, 17.92 ounces per ton. The refinery treated 18,984 tons of silver-lead bullion, producing: Silver (fine), 2,296,755 ounces; gold, 7,531 ounces; soft lead, 18,225 tons; antimonial lead, 258 tons.

"In addition to the ore smelted at Port Pirie, a quantity of concentrates was sold for export, bringing the output of finished products up to 29,944 tons lead and 2,835,954 ounces silver.

"On August 28 the first train load of ironstone, from the Iron Knob, was taken down to Hummock Hill, and since that date 6,463 tons of stone of very superior quality have been delivered at Port Pirie. Some ballasting has still to be done along the line, but this does not interfere with the traffic."

Pocahontas Coal and Coke Company.

This company has made a statement as of date March 31, 1902. The capital account includes $900,000 in common stock; $100,000 in non-cumulative 6 per cent preferred stock, and $20,000,000 in bonds. For the three months ending March 31, the receipts were for royalties on coal and coke, $97,146; timber sales, $54,693; miscellaneous, $160; total, $151,999. Expenses and taxes were $15,080, leaving a net balance of $136,919.

The report says: "The $20,000,000 joint bonds are the direct joint obligations of the Norfolk & Western Railroad Company and the Pocahontas Coal and Coke Company. They are secured by a purchase money mortgage to the Girard Trust Company, of Philadelphia, as trustee, upon lands and interests in lands acquired under deeds by the coal and coke company in Montgomery, Giles, Pulaski, Tazewell and Buchanan counties, Virginia, and in Mercer, McDowell, Wyoming, Raleigh, Boone, Logan and Monroe counties, West Virginia, aggregating about 295,000 acres, and comprising about four-fifths of what is known as the Pocahontas Flat-top coal-field. The Norfolk & Western is the owner of all the shares of capital stock of the Pocahontas Coal and Coke Company, except qualifying shares held by directors. By the terms of the mortgage the Pocahontas Coal and Coke Company is required annually after April 1, 1906, to pay to the trustees 2½ cents per ton of coal mined during the preceding year from the mortgaged lands as a sinking fund for the purchase of the bonds at not exceeding 105 and interest, or to their redemption when drawn by lot at said maximum price. The bonds also are redeemable on any first day of June or December on two months' notice at 105 and interest, either as an entire issue or any part thereof when drawn by lot.

"The Pocahontas Coal and Coke Company does not engage directly or indirectly in the buying or selling of coal or coke, its principal purpose being to make leases on royalties to operating companies. On leases now made the royalties are 10 cents per ton on coal and 15 cents per ton on coke. Prior to the close of the year 1901 about 34,359 acres of the company's lands were under lease to 25 mining companies in active operation, and from these lands during 1901 there were produced 2,645,682 gross tons of coal and 677,190 tons of coke, and the royalties therefrom amounted to $358,575; in addition to which 5,447 acres were under lease to six mining companies who were engaged in opening mines and building ovens, but shipment from these leases did not begin until after January 1, 1902. A lease of 50,000 acres additional has been executed to the Illinois Steel Company, the coal and coke therefrom to be used in furnaces and works owned or controlled by the United States Steel Corporation. The lease provides for the erection of not less than 1,000 coke ovens on or before December 31, 1902, an additional 1,000 ovens on or before December 31, 1903, and a further additional 1,000 ovens on or before December 31, 1904. It also provides for the payment of minimum royalties, and its performance by the lessee is guaranteed by the United States Steel Corporation. The number of acres of land leased from the Pocahontas Coal and Coke Company is as follows: By the Pocahontas Collieries Company, 8,349; by the Mill Creek Coal and Coke Company, 2,140; by the Illinois Steel Company, 50,000, and by various other companies, 29,426 acres."

Columbus & Hocking Coal and Iron Company.

This company owns extensive coal properties in the Hocking Valley District in Ohio. The report is for the year ending March 31, 1902. The total earnings for the year, from sales of coal, etc., were $601,153. Charges were: Operating expenses and repairs, $510,480; taxes and insurance, $12,587; depreciation, $3,558, interest on bonds, $42,925; total, $569,550, leaving a surplus of $31,603 for the year.

The report says: "The Doanville improvements—No. 1 Mine—were finished early in May, but we had been at work but a short time when a fault was encountered. Ten bore-holes were drilled and showed that on a large part of the property the vein was too thin for profitable working, and had therefore to be abandoned. Instead of mining from this mine 2,000 to 2,500 tons per day we are reduced to 800 to 1,300 tons per day, while expenses are relatively increased.

"During the summer of 1901 we also suffered from the effects of price cutting on the part of some of our competitors, which we were obliged to meet. We were able, however, to more than meet our fixed charges, a result not achieved for some years past. The situation has since been greatly improved, and all the Hocking interests are working harmoniously, prices have been put on a fair basis and are being maintained, and our net revenues this year should show considerable improvement.

"The plan for the formation of a sub-company to explore our lands for oil and gas did not meet the favor which we expected, and was therefore abandoned. As the company's coal lands are gradually being mined out, and even at the present rate will be practically exhausted in a few years, the most serious problem before us to-day is the acquirement of new coal properties."

BOOKS RECEIVED.

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail prices. These notices do not supersede review in a subsequent issue of the ENGINEERING AND MINING JOURNAL.

Wilson's Handbook of South African Mines. A Guide to the Kaffir Market. London, England; Fred C. Mathieson & Sons. Pages, 400. Price (in New York), $1.75.

Etude Geologique et Miniere des Provinces Chinoises Voisines de Tonkin. By M. A. Leclere, Paris, France; Veuve Ch. Dunod. Pages, 220; with maps and illustrations.

United States Commission of Fish and Fisheries. Bulletin No. 470. Report on the Actinians of Porto Rico. By Dr. J. E. Duerden. Washington; Government Printing Office. Pages, 52; illustrated.

The Harvard Engineering Journal. Volume 1, Number 1, April, 1902. Cambridge, Mass.; the Harvard Engineering Society. Pages, 76; illustrated.

Transactions of the Association of Civil Engineers of Cornell University. Volume X, 1901-1902. Ithaca, N. Y.; published by the Association. Pages, 136; illustrated.

Electrical and Magnetic Calculations. By Prof. A. A. Atkinson. New York; the Van Nostrand Company. Pages, 320; illustrated. Price, $1.50.

Recovery Work After Pit Fires. By Robert Lamprecht. Translated from the German by Charles Salter. London; Scott, Greenwood & Company. New York; the D. Van Nostrand Company. Pages, 176; illustrated. Price, $4.

Gas and Coal-dust Firing. By Albert Pütsch. Translated from the German by Charles Salter. London; Scott, Greenwood & Company. New York; the D. Van Nostrand Company. Pages, 124; illustrated. Price, $3

The Hydro-metallurgy of Copper. By M. Eissler. New York; the D. Van Nostrand Company. London; Crosby Lockwood & Son. Pages, 228; illustrated. Price, $4.50.

Annual Report of the Director of the Mint of the United States for the Fiscal Year Ended June 30, 1901. George E. Roberts, Director. Washington; Government Printing Office. Pages, 436.

Alternating Current Machines. By Dr. Samuel Sheldon and Hobart Mason. New York; the D. Van Nostrand Company. London; Crosby Lockwood & Son. Pages, 266; illustrated. Price, $2.50.

The Mechanics of Engineering. Volume II. By Prof. A. Jay DuBois. New York; John. Wiley & Sons. London; Chapman & Hall, Limited. Pages, 610; illustrated. Price, $10.

Commercial Relations of the United States with Foreign Countries During the Year 1901. Volume 1. Prepared by the Bureau of Foreign Commerce, Department of State. Washington; Government Printing Office. Pages, 1,192.

BOOKS REVIEWED.

Logarithmic Tables of the Measures of Length. By Thomas W. Marshall. New York; *Engineering News* Publishing Company. Pages, 106. Price, $2.

This is a convenient arrangement of logarithmic tables, bound in a form handy for desk or pocket use. It gives the logarithmics of the measures of length from 0 to 50 feet, at intervals of one-sixteenth of an inch. Its use will be found very convenient, especially for draftsmen and engineers who have to compute strains, etc., and to use small fractions of the inch. The tables have been carefully computed and checked. They are printed in type of legible size.

Theory of Steel-concrete Arches and of Vaulted Structures. Second Edition, Revised; 1902. By Prof. William Cain. New York; the D. Van Nostrand Company. Pages, 88; illustrated. Price, 50 cents.

This little treatise is already well known to engineers. In revising it the author has taken the opportunity to give a complete solution of the elastic arch of variable section. The arch of steel and concrete combined is taken up in detail to illustrate the general graphic treatment. The principles involved are very clearly analyzed and are fully illustrated by examples.

Report on the Walhalla Gold-field, Victoria. By By H. Herman, Acting Government Geologist. Melbourne, Victoria; Government Printer. Pages, 72; with maps and plates.

This is a full and carefully made report on an interesting district. The general geology of the district, the economic geology, the general conditions and the mining work done and in progress, are all considered. It is one of the series of special reports made to the Mines Department of Victoria, and will be of special value to all who are concerned in the district; besides containing much that is interesting to all students of mining geology.

National Iron and Steel, Coal and Coke Blue Book. Edited by B. H. Norwood. Pittsburg, Pa.; R. L. Polk & Company. Pages, 670. Price, $7.50.

In this book the editor and publishers have endeavored to provide a compact directory in which is combined the lists of the iron and steel manufacturers of the United States, and of coal mining and coke making concerns. The intention throughout has evidently been to give information in as concise a form as possible. The names of companies or works absorbed by the several consolidations are given in such a manner that a glance will indicate where to find the details regarding the works, etc.

In the arrangement of the volume, the aim has been to have the information placed in convenient form for ready reference, giving all the important details and omitting all unnecessary phraseology. The index of the products of the Iron and Steel manufacturers, given first, is arranged in alphabetical order, many of the headings or kinds of material being sub-divided, showing specifically what each company or firm produces. The numerals following the heading correspond to the numbers in the left hand margin, opposite the names of the companies producing the articles named. The iron and steel manufacturers follow in alphabetical order regardless of location, with a full description of the plant or plants operated, showing the equipment, tonnage capacity, shipping facilities, etc.

In the pages following are given the coal and coke companies or individuals, first arranged in alphabetical order irrespective of location, and second by States and districts. The latter list shows the location of mines or works with the tonnage of output.

It is, of course, impossible to give a full critical estimate of such a directory until it has had the test of several months' actual use as a reference-book. Such examination as can be given now shows that the information has been carefully compiled and is correctly as well as concisely given. We believe that it will be found a very convenient directory for use.

CORRESPONDENCE.

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

Consumption of Anthracite Coal at the Mines.

Sir: In your issue of May 31 you referred to the proportion of the total output of anthracite coal which is used in operating the mines and breakers; that is, in production and preparation of the coal for market. You quoted the figures given in the State mine inspectors' reports, which give the proportion so used at 8.8 per cent of the total; while the statement for the Girard Estate collieries runs up to 13.1 per cent. If these figures are correct, they would indicate that the Girard collieries were exceptionally difficult to work, or that they were careless and extravagant in the use of fuel.

From past experience in the anthracite region I do not think that any such inferences should be drawn. I believe rather that the difference in percentage of coal used is apparent only, and that the higher figure shown by the Girard Estate is due entirely to greater care taken in making the reports. My own experience in the past is that at most collieries no exact account is kept of the coal used in the boilers. A rough approximation is made of the quantity, and the only care taken is that the report shall not be too high. In nine cases out of ten the figures given the mine inspector on this point are pure guesswork.

The old rule in estimating coal mined used to be to allow 7 per cent of the shipments for coal consumed in working. This was always too low an average, and in recent years there have been additions to mining and pumping machinery which would increase the consumption.

At any rate, the figures from a few collieries where accounts are known to be carefully kept are of more value than the whole mass of returns and averages based on guesswork. The 13 per cent of the Girard Estate report is probably much nearer the truth than the 8.8 per cent returned to the mine inspector. In other words, about one-eighth of the anthracite mined is consumed at the mines.

Philadelphia, June 5, 1902. E. L.

An Explanation.

Sir: We notice that our names are being used quite frequently at present as sponsors for the richness of the Thunder Mountain mining camp. We trust that we may have the use of your JOURNAL to say that any newspaper statements purporting to voice our views regarding this district as a whole, or regarding individual claims, whether commendatory or derogatory, are published with no basis of fact.

BEALS & WHITTLE.

Boston, June 9, 1902.

QUESTIONS AND ANSWERS.

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

Ounces of Gold.—In your reports of production of gold, I notice you frequently use the expression "ounces crude," or "crude ounces." Will you please explain just what is meant?—C. S. P.

Answer.—The expression simply means gold bullion as distinguished from fine or pure gold. The custom has unfortunately grown up of reporting as "gold," bullion of varying value. It is misleading, requiring constant care in preparing reports and statistics to avoid incorrect statements. In order to avoid errors, the word "crude" is always attached to statements of gold production given in our columns, unless fine gold is given. We are pleased to say that the custom of reporting bullion of uncertain value as gold is losing ground. Thus the Transvaal mines, which formerly reported as gold, bullion from .825 to .875 fine, now make their statements in fine gold. Some of the Australian States now make reports in fine gold also. The official returns in the United States have always been made in fine gold.

Fluorspar.—Will you kindly inform me whether there is a market for fluorspar, and its value. What are the uses? In what condition is it put upon the market?—A. B. H.

Answer.—There is a demand for fluorspar, the production in the United States being 20,000 to 25,000 tons yearly. Some of it is used by chemists in making hydrofluoric acid; a larger quantity is used as flux in blast furnaces, foundry cupolas and in making steel. It is put on the market in lumps, or crushed. At the mines it is customary to sort the fluorspar, as it comes from the mines, pick out and clean the large lumps, treating the small material by crushing and screening. The lumps and fine are sold separately, the latter commanding the better price. Quotations for fluorspar delivered in New York are given in our columns each week.

Tungsten and its Uses.—1. What effect does this metal or its acid (WO_3) have upon the tenacity, ductility and malleability of iron and steel?

2. Does it increase hardness and tenacity at the expense of more than the same equivalent of ductility or malleability?

3. From what sources comes the present demand for tungsten steel?

4. Why is the metal or its ore never quoted upon the market?

5. Can as good tungsten steel be manufactured in this country as in Sweden? If not, for what reason.

6. Can you acquaint me with the address of the firms or persons best qualified in your opinion to give me the latest technical details of the application of tungsten as an iron alloy and in the arts as salts?—C. G. F.

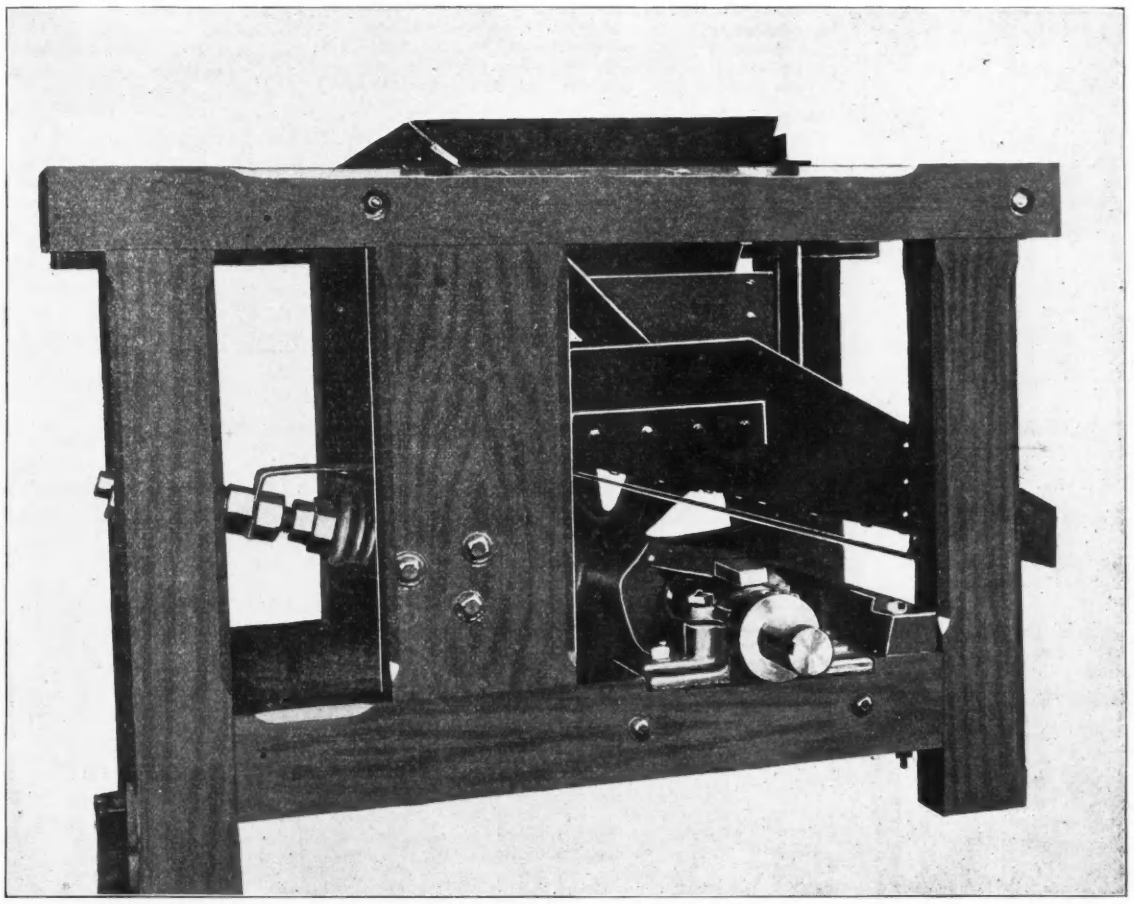
Answer.—1 and 2. Tungsten increases the hardness and tenacity of steel at the expense of its malleability and ductility. Its use as an alloy has been where a very hard steel is required, as in tool steel, and to a small extent in armor-plate. Its use in steel for such purposes as structural material or rails is in doubt.

3. The increased demand for tungsten steel, we believe, has been largely in view of its possible advantages for making armor-plates, projectiles and the like. Its use for tool steel is also increasing.

4. Quotations for tungsten and ferro-tungsten are given in our metal market colmun each week, under the head of minor metals. No quotations for ores can be given, as the market is limited, and ores are bought on assay.

5. We know of no reason why as good a tungsten steel cannot be made in this country as in Sweden, if the same care is taken in its manufacture.

6. Your last question is difficult to answer. Recent experiments with tungsten steel have been conducted by or for manufacturing companies, who keep the results to themselves. Probably Prof. Henry M. Howe, of Columbia University, New York, or Mr. Albert Sauveur, of Boston, could best answer your question.



NEW CENTURY ORE FEEDER.

THE NEW CENTURY ORE FEEDER.

This machine has been designed for feeding crushed ore to rolls or other machines in a milling plant. In the form illustrated herewith it is not adapted to feeding a battery of stamps. Many feeders that have been placed on the market have not stood the test of hard and continuous usage, nor have they worked satisfactorily when required to feed coarse ores.

This machine will handle equally well material of all sizes from fines to the largest product of the crusher. It is contained in a substantial frame work with entrance dimensions of four and one-half by two and one-half feet. The top of the frame supports a hopper made of one-quarter inch boiler plate, with adjustable gate in front; from this the ore drops into the shaking pan, which is also made of ¼-inch plate, with removable chilled cast iron bottom, bolted in. The shaking pan is suspended by four pieces of flat spring steel, riveted to angle irons on the pan, and bolted to the frame above.

The motion and adjustments given to the shaking pan are identical with that of style A "New Century" drop motion jigs, except that in this case it is horizontal.

The revolving shaft carries a high carbon drop forged steel cam; surrounding this cam is the cam head in which is a steel roller; from the upper end of this cam head extends a heavy rod through the guide box at the back of the machine. This rod passes through a 5-inch I beam bolted to brackets, which are held in position by their bolts shown in the broad upright. To the left of this I beam is a coil spring with a tension adjusting nut at its upper end.

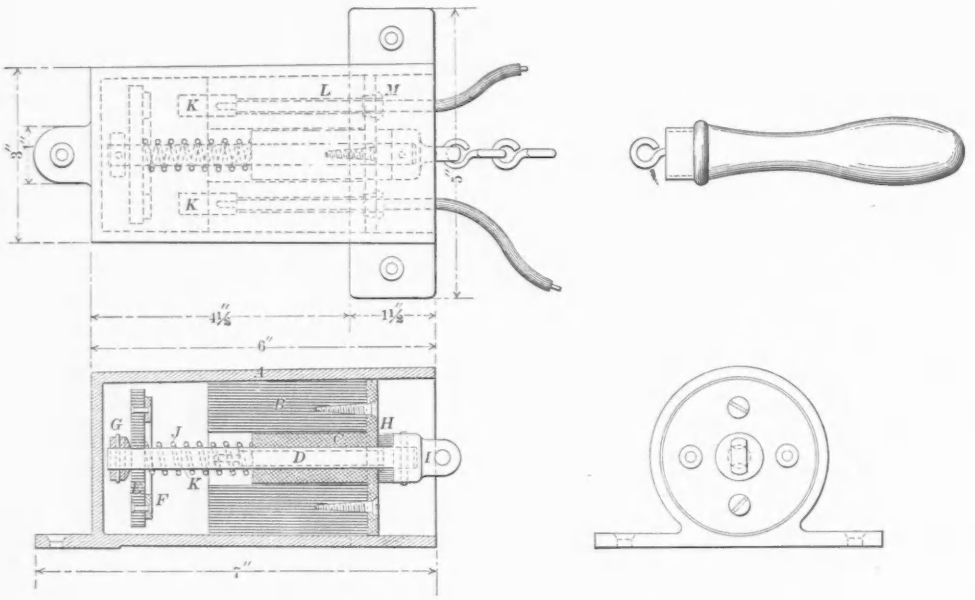
The length of stroke or motion of the pan is entirely controlled by a nut on the rod in front of the I beam, the stroke being stopped by the striking against a rubber on the front of the I beam. Anything from 1-16 to ⅞-inch stroke can be given to it at will. All adjustments for length of stroke and force of stroke are made while the machine is in operation. It is manufactured by the American Concentrator Company of Joplin, Missouri.

WATERPROOF ELECTRIC SWITCH, FOR MINE SIGNAL SYSTEM.

An electric switch, thoroughly waterproof for use in mines and other wet places, where moisture interferes with a proper circuit connection, is a recent device by John Kirschweng, electrician at the Butte Reduction Works, Butte, Mont. This is designed to take the place of the common knife switch. The details as shown in the illustration are: (A) Outer shell, or casing. (B) Tapered insulating material of wood boiled in shellac, giving it a perfect insulation. (C) Metallic bush and flange. (D) Plunger, or piston, made of bronze metal to resist the action of copper water. (E) An insulated disk made of red fiber, ¼-inch thick by 2⅜ inches in diameter. This disk is fitted loosely on upper end of plunger (D). (F) Brass ring, ⅛-inch thick by ⅝-inch wide rivetted to outer diameter of fiber disk (E), the outside rim of brass ring being set in ⅛-inch from edge of fiber disk. (G) Collar of brass fastened to upper end of plunger (D) to hold disk (E) in place. This collar is made with a half round top, on which disk (E) rests. This latter, being loose on the plunger, allows the disk to always adjust itself with contact points (K). (H) Rubber gasket to exclude any moisture reaching the interior of the device. (I) Combination collar and eye of brass fastened to lower end of plunger. (D) At-

tached to this eye by a short brass chain, is the operating handle. A quick short pull on the handle opens the circuit. (J) Spiral spring of steel, the compression of which by a pull on the handle opens the circuit, and compresses rubber gasket against flange (C). (K) Are contact points made of bronze material imbedded ¾-inch in insulating material (B), and project ¼-inch above the material. In the lower end of the contact points is fastened a rubber covered copper wire. This wire is further protected with shellac, and is marked (L). (M) Is a vulcanized insulator tredded, and firmly secured in flange (C), through which passes the copper wire, marked (L). This switch, as stated, is designed to take the place of the common knife switch now in use. It is claimed for this switch that there is no possibility of an arched circuit, nor danger from leakage. It is also claimed to be practically indestructible, whereas a knife switch will wear out in a few weeks.

COAL ON FRENCH RAILROADS.—The consumption of coal upon the principal French railways last year amounted to 5,638,000 tons. The largest consumer was the Paris, Lyons & Mediterranean, which took 1,548,000 tons, the Northern of France coming second with a consumption of 1,083,800 tons, while the Orleans and Western of France consumed rather more than 800,000 tons each. The coal consumed upon the Paris, Lyons & Mediterranean



KIRSCHWENG'S WATER-PROOF ELECTRIC SWITCH FOR MINES.

last year cost $4.72 per ton. On the other hand, the Orleans only paid $3.35 per ton for the coal which it required. Of the 800,000 tons consumed by the Western of France, 619,000 tons came from England, and 7,800 tons from the United States. The Eastern of France obtained 300,000 tons from Belgium; the Northern of France, purchased 100,000 tons in England; and the Orleans took 370,000 tons from England. The Paris, Lyons & Mediterranean also obtained some of its coal from England.

PATENTS RELATING TO MINING AND METALLURGY

UNITED STATES.

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

Week Ending May 27, 1902.

700,735. APPARATUS FOR WASHING COAL, COKE, ETC.—Cuthbert Burnett, Grange, near Durham, England. In a coal-washing apparatus in which the heavy impurities or dirt are discharged at the higher end of the slope of a sloping endless belt moving toward that end while the washed coal is floated down toward the other end, a dip in said belt near the last-named end for causing the washing-water to be there comparatively at rest, in order that the fine parts of the washed coal held in suspension, may deposit there in combination with means for raising the washed coal from such dip.

700,741. ORE BUCKET, DUMPER, AND CHUTE.—Louis Collier, Cripplecreek, Colo., assignor of two-thirds to Alfred E. Parker, Cripplecreek, Colo., and Joseph M. Thralls, Wellington, Kan. In combination with a hoisting means and a tilting bucket raised and lowered thereby, said bucket having a button suspended from its bottom, a fixed chute having a trap in the bottom thereof, means to operate the trap, a pivotally-mounted dump-section at the upper end of the chute, said dump-section having means to co-operate with the button and dump the bucket, and means to set the pivotal dump-section.

700,746. MACHINE FOR MOLDING BRICKS OR BLOCKS.—Charles G. Davies, Benton Harbor, Mich. The combination with a vertically-movable mold-box, of a latterally-movable plate adapted to be moved beneath the lower end of the mold-box, a horizontally-movable feed-box adapted to be moved across the upper end of the mold-box for the purpose of filling the said mold-box, the upwardly movable plunger adapted to be projected through the plate and into the lower end of the mold-box, the downwardly-movable plunger adapted to be projected into the upper end of the mold-box, and means for operating the mold-box, plate, feed-box, lower and upper plungers.

700,789. ORE-CHUTE AND TRAP-DOOR.—John A. Lindall and Nils Mattson, Two Harbors, Minn.—In mechanism for regulating the flow of ore or materials in transporting same from one receptacle to another, the combination of two rods extending from the top of a pocket down to the lower end of the same and there secured, suitable trap-doors being secured on said rods, said doors being provided with suitable pegs or projections, suitable cogwheels being secured on the upper end of said rods, said cog-wheels intermeshing with each other, a suitable lever being secured on one of said rods, a suitable stopper to engage said lever, a smaller cog-wheel intermeshing with one of the main cog-wheels secured on the rods, said smaller cog-wheels being actuated by a lever.

700,799. APPARATUS FOR UNLOADING SHIPS' CARGOES.—Arthur Mullan, San Francisco, Cal. The combination of a frame, means for supporting the lower end of the frame, guy-ropes attached to the upper portion of the frame for maintaining said frame in an upright position, a chute, an operating-platform secured to the upper end of the chute, and means for supporting said chute from the upper end of the frame.

700,808. ELECTRIC FURNACE.—William R. Parks, Chicago, Ill. In an electric furnace the combination with a tubular positive electrode and gas-burning devices extending through the walls of said electrode mediate its ends, of a suitable negative electrode.

700,823. BRICK-PRESS.—Charles W. Reynolds, Toledo, Ohio, assignor of one-half to Seth T. Pomeroy, Toledo, Ohio. The combination of a platform or supporting-frame, a head-block supported above said platform, fastening-bolts inserted through the head-block and the platform, a resistance-plate on the lower end of the bolts, springs coiled around the bolts between the platform and the resistance-plate, a mold-wheel arranged below the head-block, and means for pressing a brick in the mold-wheel against the head-block.

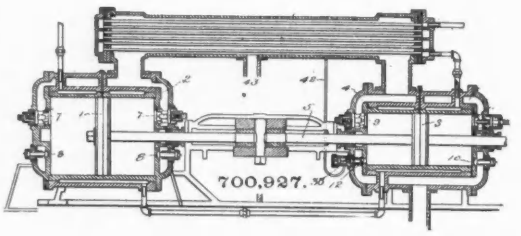
700,860. VACUUM APPARATUS FOR BOILING BRINE.—Gerhard N. Vis Schweizerhalle, Switzerland. In apparatus for boiling brine the combination with a pan provided at its lower end with a tubular extension, a brine vessel open to the atmosphere and arranged below said extension to receive the same, means for heating the pan and means for creating a vacuum in the pan.

700,888. FLUID FOR PROMOTING COMBUSTION.—Timoleone Battistini, Genoa, Italy. A fluid for promoting combustion which comprises a solution consisting of one part by weight of nitrate of sodium and two parts by weight of carbonate of sodium.

700,889. EXTRACTING AND REFINING ASPHALTUM.—Arthur F. L. Bell, Carpenteria, Cal., assignor to the Alcatraz Company, San Francisco, Cal., a corporation of West Virginia. In asphaltum extracting and refining apparatus, a vertical series of crushing-rollers arranged in pairs, laterally-adjustable bearings for said rollers, horizontal channel-beams above and below said bearings supporting the same, struts between the bearings, adjustable through-keys passing through the webs of the channel-beams outside the bearings, and transferable shims or packing for adjusting the horizontal distance between said rollers.

700,914. HYDROCARBON BURNER.—John F. Hardy, Monticello, Ind. A hydrocarbon-burner comprising a body portion provided with a mixing-chamber, a supply-pipe and an injector-tube, the latter discharging into the mixing-chamber.

700,927. AIR-COMPRESSOR.—Ebenezer Hill, South Norwalk, Conn. A compound air-compressor having cylinders, pistons, inlet and discharge valves and cylinder-interduct,



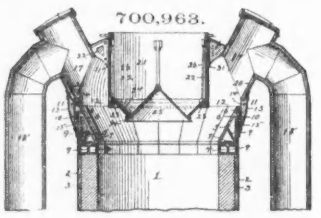
means for opening a valve of the second cylinder, and a passage so connecting said interduct with the valve-opening means that the pressure in the cylinder interduct controls the operation of the valve-opening means.

700,934. APPARATUS FOR CONDENSING SMOKE FUMES AND GASES.—William B. Jackson, Denver, Colo., assignor to the Smoke Exterminator and Fume Condenser Company, Pueblo, Colo. The combination of a condensing-tank, means for introducing water in the form of a spray into the tank, a conduit leading from the stack and communicating with the condensing-tank for discharging the products of combustion thereinto, means for introducing a jet of steam into the tank at the discharge extremity of the said conduit, to give the desired velocity, and means mounted on the wall of the tank directly opposite the discharge extremity of said conduit, for temporarily suspending said products in the tank to facilitate condensation.

700,936. PUMP.—Alfred E. Johnson, Victor, Colo. In a pump, the combination of a cylinder composed of two overlapping parts shaped to form a cavity whose inner portion is curved and communicates with the cylinder-chamber, and whose outer extremity is exposed, a packing-gland adapted to enter said cavity between the cylinder parts, a plunger-stem, a hollow lower plunger connected with said stem, the said plunger being provided at its upper extremity with a valve-seat having openings separated by ribs, a closed upper plunger also connected with the valve-stem.

700,941. PROCESS OF TREATING COPPER OR OTHER ORES FOR OBTAINING THEIR CONTENTS OF METALS.—Nathaniel S. Keith, Arlington, N. J. The process of obtaining a reguline metal from its ores; which consists in powdering the ore; roasting the powdered ore; leaching the roasted ore with a solvent of the metal; and electrolyzing the lixiviate to deposit the metal therefrom, by passing it as an electrolyte through a succession of two, or more, electrolytic cells, arranged so that the cells are connected in electrical series with a source of electricity; the anodes insoluble; the electrodes of each cell in electrical multiple; and having gradually-increasing surfaces; whereby there is a gradual reduction of the current density as the metal of the electrolyte is deposited.

700,963. BLAST-FURNACE TOP.—Patrick Meehan, Lowellville, Ohio. A blast-furnace having a shaft, a globe-shaped top with an unobstructed annular passage to the furnace-

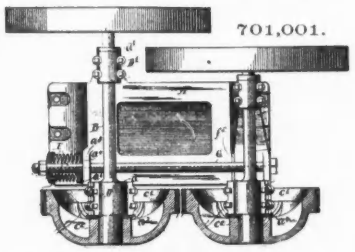


chamber, and a hopper projecting through said top and extending down into the globe-shaped chamber with its discharge end below the largest diameter of said globe-shaped chamber, whereby an enlarged space is provided to allow for the expansion of gases in an explosion.

700,972. APPARATUS FOR LIXIVIATING ORES. Paul Naef, Argentine, Kan. A lixiviating-column adapted to

be filled with a leaching solution, and having a series of superimposed and inclined hoods and rings, alternating and presenting oppositely-inclined surfaces for the downward passage of ore thereover, the said hoods and rings being numerously perforated to permit the upward passage of gas therethrough.

700,974. PUMPING-ENGINE.—Herman Nielsen, South Brooklyn, N. Y., assignor of one-half to F. W. Ofeldt & Sons, South Brooklyn, N. Y. A duplex pumping-engine comprising a series of water-cylinders and pistons therein and a series of steam-cylinders and pistons therein, each water-piston connected with a steam-piston and ducts controlled by said pistons, one steam-piston controlling the ducts leading to and from the other steam-piston.


701,001.

700,979. COMPOSITION OF MATTER FOR WELDING STEEL.—Charles Pangborn, Kalamazoo, Mich. The combination of boracic acid, iron or steel, gelatin, and water, for a welding compound.

701,001. ORE-CRUSHER.—Robert H. Aiken, Winthrop Harbor, Ill. An ore-crusher comprising crushing-rolls actings are in alignment with each other.

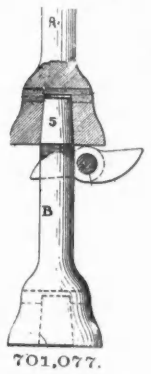
701,002. METHOD OF EXTRACTING PRECIOUS METALS FROM THEIR ORES.—Joseph B. de Alzugaray, London, England. A process for treating ores containing precious metals and consisting in adding the crushed ore to a solution of sodium chloride, sodium carbonate and potassium cyanide, then forcing through the mass a gaseous mixture of bromine and air and recovering the precious metals from the solution by any known means, such as electrolysis.

701,022. FURNACE.—Victor E. Edwards, Worcester, Mass., assignor to the Morgan Construction Company, Worcester, Mass., a corporation. In a furnace for heating billets provided with a transverse opening at the charging end of the furnace, of one or more supports for supporting the roof above said opening, one or more doors for closing said opening, with a space between said supports and said doors, and an opening in one of the side walls of the furnace.

701,023. FEEDING MECHANISM FOR BILLET-HEATING FURNACES.—Victor E. Edwards and Elbert H. Carroll, Worcester, Mass. The combination with the heating-chamber of a furnace for heating billets and provided with openings in one of its walls for the introduction of feed-rolls, of a series of feed-rolls journaled in bearings outside the heating-chamber and projecting into said chamber with their axes placed at an oblique angle with the wall of the heating-chamber, means for rotating said rolls and an opening for the admission of a billet in alignment with said rolls.

701,024. CONVEYER FOR METAL RODS OR BARS.—Victor E. Edwards, Worcester, Mass., assignor to the Morgan Construction Company, Worcester, Mass., a corporation of Massachusetts. In a conveyer for metals rods or bars, the combination with a series of rotating conveyer-rolls arranged to support a bar thereon, of means whereby the axes of said rolls are shifted into a position at one side of a line at right angles to the line of longitudinal movement.

701,026. HYDROCARBON-BURNER.—Gilbert R. Elliott, Boston, Mass. In a burner, the combination with the vapor-generator, of the mixing-chamber having an adjustable ignition-opening, and means operated by the variations of pressure within the vapor-generator, to automatically proportion the extent of ignition-opening to said pressure.



701,077.

701,077. STAMP-STEM.—Walter S. McKinney, Chicago, Ill. A stem for stamps and analogous drop-hammers consisting of two or more sections adapted to be united in extension of each other, each section being adapted for connection with a hammer or stamp-head and being adapted at its opposite end for engagement with a similar stem-section, whereby said stem-sections may be interchangeably arranged.

701,103. SLIDE-RULE.—Edwin Thacher, New York, N. Y., assignor of one-half to Edson M. Scofield, Pittsburg, Pa. A slide-rule, bearing two sets of duplicate logarithmic scales, one set upon each side of its longitudinal center, one scale of each set being upon the slide and one upon the base, each scale having a length equal to the graduated length of the rule, both scales of one set reading continuously from left to right, and both scales of the other set reading from center to right and thence from left to center.

701,134. PROCESS OF TREATING ORES.—Charles J. Best, Denver, Colo. A process of treating ores, which consists in grinding them to a suitable fineness, supplying thereto a solution, consisting of a large proportion of water, a small proportion of acid and a salt mixture, consisting approximately of two parts common salt, one and one-quarter parts niter, one and one-quarter parts alum and one and one-half parts nitric acid, boiling the whole for a proper length of time, filtering the solution, precipitating the metallic portions by the application of sulphureted hydrogen to the filtered solution, until a sulphide precipitate is formed, then heating such precipitate with the usual fluxes to drive off the vapors, then drawing off the metals, and then returning such solution and vapors for use in the heating-tank.

701,145. APPARATUS FOR MANUFACTURING CHARCOAL.—Charles J. T. Burcey, Syracuse, N. Y. An apparatus for comprising a combustion-chamber, a receiving-chamber for the wood to be charred, a plurality of heat-conducting passages communicating with the combustion-chamber and arranged in proximity to different portions of the interior of the receiving-chamber, said pasages being each provided with an inclosing wall for preventing the escape of the products of combustion from the passages into the interior of the reeciving-chamber, and means for controlling the flow of the products of combustion from the combustion-chamber through said passages independently and thereby rendering substantially uniform the treatment of the wood in the different portions of the interior of the receiving-chamber.

701,173. SAFETY DEVICE FOR BLASTING PURPOSES.—James M. Doyle, Denver, Colo. The combination with a fuse and a cap attached to one extremity thereof, of a tubular open-ended sheath through which the fuse is passed, the cap being located beyond the inner extremity of the sheath, said sheath being of a size to fit the fuse quite closely, but at the same time to permit the easy insertion and removal of the cap and fuse, the arrangement being such that the tamping material is packed around the exterior to the sheath.

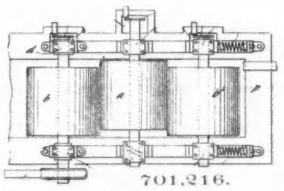
701,186. APPARATUS FOR GENERATING GAS.—William J. Faulkner, Chicago, Ill. In a gas generating apparatus, a gas-generating chamber, a combustion-chamber, such apparatus provided with an inlet and an outlet for molten material and such chambers provided with a communicating passage-way through which molten material may flow, the gas-generating chamber provided with an outlet for gas and the combustion-chamber provided with an outlet for the products of combustion.

701,203. FUSE-IGNITER.—Charles K. Jenkins and Hugh J. McDonald, South Butte, Mont. A fuse-igniter comprising a shell containing fusible material and attaching means on said shell for connecting said shell to the ends of a bunch of fuses, whereby the same are protected and caused to be simultaneously ignited.

701,212. AMALGAMATOR.—John S. Marquette and Peter J. Nelson, Baltimore, Md. In an amalgamator the combination with a tank or receptacle, provided with an amalgam-receptacle at its bottom having a central discharge-opening, of a revolvable agitator within the tank, a plurality of overflow-traps communicating with the upper portions of the tank, a shaft extending through a plurality of said traps and agitators on said shaft within the traps.

701,215. METHOD OF OBTAINING ZINC BY ELECTROLYSIS. Ludwig Mond, London, England. A method of obtaining zinc in a solid metallic condition which consists in depositing the zinc on separate cathodes by electrolysis and simultaneously therewith subjecting the deposited zinc upon one cathode to a longitudinal and transverse rubbing action of the zinc deposited upon the other cathode under pressure.

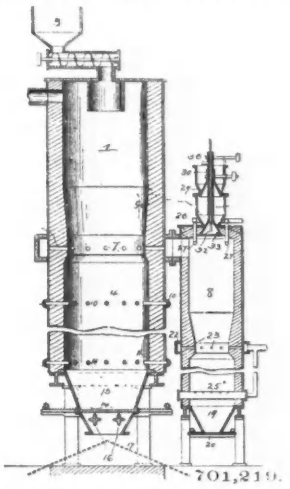
701,216. APPARATUS FOR OBTAINING ZINC BY ELECTROLYSIS.—Ludwig Mond, London, England. In apparatus for obtaining zinc by electrolysis, the combina-


701,216.

tion of a number of cylindrical cathodes rotating in contact with each other within an electrolytic bath, means for pressing the cylinders against each other and means for producing a longitudinal rubbing action between the cylinders.

701,219. APPARATUS FOR THE MANUFACTURE OF COKE.—Paul Naef, New York, N. Y. A coking apparatus provided at its lower end with a coke-outlet and having inlets for a gaseous fluid, inlets for steam at a lower level than the gaseous fluid inlet and inlets for water at a still lower lever, all of said inlets being above the coke-outlet.

701,239. MEANS FOR WORKING ORES BY THE CYANIDE PROCESS.—Frank D. Wood, San Francisco, Cal.


701,219.

An apparatus for working ores consisting of a plurality of tanks arranged in line, a conveyer passing through each of said tanks and returning thereunder, said conveyer elevated at the rear of the machine more than at the front, and the rear end of one of the conveyers discharging upon the front end of the other conveyer, and means whereby the conveyers may be driven in unison.

11,995. PROCESS OF MAKING SULPHURIC ANHYDRIDE.—Henry S. Blackmore, Mount Vernon, N. Y. The process of producing sulphuric anhydride (SO_3), which consists in oxidizing sulphur dioxide by the action of metallic oxide.

GREAT BRITAIN.

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

Week Ending May 8, 1902.

9,333 of 1901. MINE HOIST PULLEY.—C. Becker, Manchester. An improved winding pulley for rapid winding in mines.

9,911 of 1901. ROCK DRILL.—T. Wrightson and J. Morison, London. A rock drill of percussive type with two cylinders side by side, the drills acting alternately.

11,519 of 1901. FUEL BRIQUETTES.—C. Jousset and W. R. McKay, London. Fuel blocks made by binding small coal together with resinous matter and hyposulphite of soda.

13,139 of 1901. ELECTRIC FURNACE.—E. J. Duff and the United Alkali Co., Liverpool. An improved construction of electric smelting furnace specially useful for making carbides.

13,246 of 1901. SAFETY LAMPS.—B. D. Williams, Pontypool. Improved method of arranging the wires used in igniting miners' safety lamps by an electric current.

3,128 of 1902. DISINTEGRATING SUPERPHOSPHATES.—H. J. Merk, Hamburg, Germany. An improved machine for disintegrating superphosphates.

3,492 of 1902. STERILIZING WATER.—Siemens & Halske, Berlin, Germany. Apparatus for filtering liquids and treating them with gases, especially intended for sterilizing water with ozone.

Week Ending May 15, 1902

5,311 of 1902. VACUUM TANK.—J. Neal, Costerfield, Australia. A vacuum tank communicating by pipes to the various levels of a mine and drawing out foul air by suction.

1,699 of 1901. FEEDING TIN-PLATES.—G. B. Hammond and T. Dennis, Neath. Machinery for feeding metal plates to tinning and other baths.

9,133 of 1901. NITRIC ACID MAKING.—G. Plath, Cassel, Germany. Improved arrangement of tubes in distilling apparatus for nitric acid.

12,029 of 1901. CEMENT MILL.—R. Pemberton, Northfleet, Kent. Improved grinding mill for cement, working either wet or dry.

12,781 of 1901. SULPHURIC ACID MAKING.—Badische Anilin and Soda Fabrik, Ludurgshafen on Rhine, Germany. Dividing the catalytic process for making sulphuric anhydride into two or three operations, thus reducing the amount of platinum used.

13,001 of 1901. LIME RECOVERY.—C. J. Harris, Winchester. Recovering caustic lime from the precipitates formed in water softening apparatus.

1,682 of 1902. HOT BLAST FOR COPPER SMELTING.—G. Mitchell, Naco, Arizona, U. S. A. Method of using the gases given off in copper smelting furnaces for heating the air blast.

2,865 of 1902. BRASS FURNACE.—H. E. Auman, Reading, Pennsylvania, U. S. A. Improved crucible furnace for making brass.

PERSONAL.

Mr. F. S. Stevens, of Scotland, has been examining his mines at Lawson, Colo.

Mr. Andrew Dyatt is in charge of operations at the Bassick Mine, Querida, Colo.

Mr. R. A. F. Penrose, Jr., of Philadelphia, Pa., was in New York City on June 10.

Capt. Alexander McLeod, a well-known Montana prospector, is in New York City.

Mr. T. B. McKilligan has been appointed inspector of mine revenue for British Columbia.

Mr. G. Simmers, of San Francisco, is superintendent of the Hilda Mine, near Downieville, Cal.

Mr. F. Bolton, of the Long Lake Gold Mines Company, of England, is at Rat Portage, Ontario.

Mr. W. S. Stratton has been looking over the mining properties he controls at Cripple Creek, Colo.

Mr. E. C. Miles, a mining operator of Black Hawk, Colo., is making a business trip to St. Joseph, Mo.

Mr. T. A. Rickard was a visitor in the Cripple Creek, Colo., District last week on professional business.

Mr. Andrew Rogers, a well known mining man of Aspen, Colo., has been making a trip to Central City, Colo.

Mr. James H. Hooper, who has been operating mines in Gilpin County, Colo., has gone to Nathan, Mich.

Mr. R. M. Edwards, of Houghton, Mich., has returned from a visit to the Kittie Burton Mine in Idaho.

Mr. O. M. Allen, Jr., of Kalamazoo, Mich., is investigating mining property in Montgomery County, N. C.

Mr. W. B. Jackson, of the Stanley Electric Manufacturing Company of Pittsfield, Mass., has gone to Europe.

Mr. Frederick B. King, of Bridgeport, Conn., has been in San Francisco en route for the East via Portland, Ore.

Mr. A. Dron is now superintendent of the Dexter-Tuscarora Mill, at Elko, Nev., succeeding Mr. H. O. Milner, resigned.

Mr. James A. Wilson, of Mitchell, S. D., has been appointed manager of the Freeland Extension Mine at Idaho Springs, Colo.

Prof. A. E. Seaman, of the Michigan College of Mines, Houghton, Mich., recently inspected the Kittie Burton Mine in Idaho.

Mr. B. W. Begeer has been appointed superintendent of the Last Chance Mining Company's cyanide plant at Mogollon, N. M.

Mr. Ernest Le Neve Foster, a well known mining man of Denver, has been looking over mining property in Gilpin County, Colo.

Mr. Charles E. Hart, general manager of the John Jackson Mining Company, of Joplin, Mo., was in New York City the past week.

Mr. T. E. Schwarz, mining engineer of Denver, Colo., returned there a few days ago from a two months' professional trip to California.

Mr. E. J. Schmitz, a well-known geologist and mining expert, of New York City, has gone to Butte, Mont., on professional business.

Mr. Wilford Proctor is on a visit to Oakland, Cal., from Colombia, S. A., where he is manager of a placer gold mine for an English company.

Mr. R. C. Vidler, of Idaho Springs, Colo., has gone to the Rainy River, Ontario, country to examine copper mines for an English syndicate.

Capt. W. Murdock Wiley, of New York City, president of the Seminole Mining Company, of Georgia, visited that company's mine recently.

Mr. C. W. Wright, who recently graduated from the Michigan College of Mines, has accepted a position with the Geological Survey of Canada.

Mr. Edward Hopkins, of London, Eng., has been on a visit to Col. B. C. Hambley at the Whitney Reduction Works, near Gold Hill, N. C.

Mr. Daniel MacLaren, who recently inspected mining properties at Cripple Creek, Colo. has gone to Sydney, Australia, whence he goes to Chile.

Mr. Cyrus O. Baker, Jr., of the firm of Baker & Company, Newark, N. J., refiners of platinum, has just returned from a business trip to Europe.

Mr. C. L. Dignowity is to spend the summer at Boulder, Colo., where he has mining interests under development. He will be there until October 1.

Mr. Solon J. Vlasto, who is interested in the mineral industry of Greece, Turkey and Russia, has left New York City for Europe on a two months' vacation.

Mr. A. W. Thompson, president of the Republic Iron and Steel Company, is in the Birmingham, Ala., District, looking after the blowing in of the furnace at Thomas.

Mr. Duncan McVichie, general manager of the Bingham Consolidated Gold and Copper Company, of Bingham, Utah, is taking a brief vacation on the Pacific Coast.

Prof. W. P. Blake, director of the Arizona School of Mines, will spend the summer vacation, until September, at his home at Mill Rock, near New Haven, Conn.

Mr. Thomas Brown, of Franklin, Pa., president of the Consolidated Mining and Smelting Company, has been looking over the properties of the company at Cerillos, N. M.

Mr. William E. Parnall, Jr., of Calumet, Mich., has been appointed a director of the Michigan College of Mines to succeed Mr. Thomas B. Dunstan, of Hancock, Mich., deceased.

Mr. James Lawlor, recently at Searchlight, Nev., for the Improvement Company, is now master mechanic of the Copper Queen Consolidated Mining Company, at Nacosari, Mex.

Mr. E. Z. Burns, mining engineer, associated with Messrs. Simonds & Wainwright, of New York City, has just returned from a professional trip through New Mexico and Arizona.

Mr. M. W. Tanner, manager of the Bertha property at Idaho Springs, Colo., has gone east on business and will be absent 30 days. He will examine mines in the Black Hills before his return.

Mr. Walter C. Belcher, of Holbrook, Mass., has been at the Industrial Mining Company's cement placer ground at Cerillos, N. M., to examine the auriferous beds owned by the company.

Mr. A. T. Holman has resigned his position as superintendent of the Vindicator Company at Cripple Creek, Colo., and will henceforth give all his time to the Golden Cycle Mining Company.

Messrs. J. J. Leidecker, of Butler, and N. Clark, of Oil City, Pa., interested in the Hotchkiss Mountain Mining and Reduction Company, are investigating the mining outlook at Lake City, Colo.

Mr. Hi. Henry is in New York City investigating the latest devices in mining and metallurgy. Mr. Henry is the owner of the Sir Henry group of claims in West View District, near Pearl, Idaho.

Mr. John B. Hastings, of New York City, is in the Lake Superior copper district for a short time noting methods employed at the mines and mills. Mr. Hastings will also visit Butte, Mont., mines.

Mr. A. W. Tucker, formerly assayer and chemist of the Union copper mines, but now a resident of Newburyport, Mass., is making an examination of the Bright Gold Mine in Montgomery County, N. C.

Mr. W. A. Irwin, now a resident of London, Eng., at one time superintendent of the Standard Mine at Bodie, Cal., and late of the Kalgoorlie Gold Mines of Australia, is in San Francisco, Cal., for a brief visit.

Mr. Alexander C. Humphreys, of the engineering firm of Humphreys & Glasgow, of New York City, has been elected president of Stevens' Institute of Technology at Hoboken, N. J., to succeed the late Dr. Henry Morton.

Mr. John M. Jackson has been appointed manager of the Consolidated Stanley Mining Company, at Idaho Springs, Colo., succeeding Mr. James Bowden, who resigned as manager but will remain as consulting engineer.

Mr. Edward Hooper, consulting mining engineer of London, Eng., arrived in New York City this week on the *St. Louis*. He will visit mines in the United States and British Columbia, among others the Ymir Mine.

Mr. Ph. Lidner, mining engineer, who went to Europe for a 3 months' trip last January on professional business, has now been engaged to go to Siberia to examine some mining properties, and will probably not return until next fall.

Mr. E. C. Headrick, manager of the Westinghouse plant at Havre, France, is now on a visit to this country. The Havre works, which manufacture electrical machinery for the French, Belgian, Italian and Spanish markets, are to be doubled in capacity.

Mr. E. A. Gilbert has been promoted to be superintendent and secretary of the Niles Boiler Company, of Niles, O., vice Mr. J. H. Orwig. Mr. Gilbert has been connected with the business since the establishment of the company, and deserves the preferment.

The officers and directors of the Sloss-Sheffield Steel and Iron Company, including president, J. C. Maben; secretary-treasurer, J. W. McQueen, and directors E. W. Rucker and George Parson, have visited all the plants of the company in Alabama. The company is trying to increase its holdings of coal properties.

Mr. W. E. Zwicky, of Idaho Springs, Colo., for some time manager of the Big Five mines and tunnel, has accepted a position with the Rambler-Cariboo Mines, Limited, of Sandon, B. C., and will go there as soon as he can obtain relief from the Big Five. He will have charge of the mines and new concentrating mill just erected.

Mr. I. K. Robinson, of Iquique, Chile, who represents the Westinghouse and other North American interests on the west coast of South America, is now on a visit to the United States. He has placed a contract with the Westinghouse Electric and Manufacturing Company, of Pittsburg, Pa., for several multipolar direct current motors of various sizes, for use in the Chilean nitrate fields.

Mr. James D. Hillhouse, Sr., formerly foreman of the Adger Mines of the Tennessee Coal, Iron and Railroad Company, has been appointed Assistant State Mine Inspector of Alabama by Governor Jelks. He has resigned his Adger position. On June 6 the mine at Adger got out 1,124 tons of coal, the largest amount in one day at this place in two years. Mr. Hillhouse will be succeeded at the Adger mines by Mr. S. M. Meigs, whom he succeeds as assistant inspector.

OBITUARY.

Gordon H. Gile, a pioneer iron mining man of Wisconsin, president of the Colby Bessemer Iron Company, and treasurer of the Northern Chief Iron Company, died at his home in Oshkosh, Wis., recently. Mr. Gile had been in poor health for some years, but was actually engaged in business up to the time of his death. He was born in Oxford, N. Y., 74 years ago, and went to Oshkosh in 1871.

Emmon H. Downer died at his residence in Colorado Springs, Colo., on June 4, from cancer, after a long illness. Mr. Downer was 57 years of age, having been born in Hancock County, Ill., in 1845. He went to Colorado Springs in 1880, and had resided there since. At the time of his death he was director of several mining companies, having followed the mining business for the last few years. He was one of the original locaters of the Cripple Creek District.

Richard G. Willoughby, known all over the Pacific Coast, and especially in British Columbia, as "Dick" Willoughby, died recently at Vancouver at the age of 75. He was a pioneer miner and was in many a rush to new placer fields. When he first went to British Columbia he went north and was one of the discoverers of the Cariboo region, where he made a big stake, washing out, it is said, more than $125,000 of gold in a short time. From Cariboo he went on to Cassiar, and was one of the discoverers in that region, and spent 3 years there, being again successful in making a big stake. In the early 60's he went to Alaska, and located near where Fort Wrangel is now. Since that time he had traveled all over Alaska.

SOCIETIES AND TECHNICAL SCHOOLS.

LEHIGH UNIVERSITY.—The graduating class this year includes 17 candidates for the degree of civil engineer, 8 for that of mechanical engineer, 4 for that of metallurgical engineer, 14 for that of mining engineer and 6 for that of analytical chemist.

CLARKSON SCHOOL OF TECHNOLOGY.—The graduating theses of this year's class at this school at Potsdam, N. Y., were on the following subjects: "Development of the Water Power of High Falls on Deer River;" "A Study of the Possibilities of the Development of Water Power on the Indian River;" "A Design for a Power Plant on the Indian River;" "Investigation of the Properties of Liquid Condensers;" "Influence of Chemical Composition on the Electric Conductivity of Wrought Iron and Soft Steels;" "Performance of a Motor Generator Set vs. a Rotary Converter of the Same Capacity;" "The Design, Construction and Performance of an Experimental Polyphase Transmission Line;" "An Experimental Study of a Single-phase Induction Motor;" "Experiments on the Flow of Steam Through Rectangular Orifices;" "Installation of, and Experiments on, a 15-H. P. Otto Gas Engine," and "The Design of a Compound Marine Engine."

AMERICAN CHEMICAL SOCIETY—NEW YORK SECTION.—The final meeting for the season was held at the Chemists' Club June 6, at which the annual election was held. The result was as follows: Chairman, Thomas J. Parker; vice-chairman, E. H. Miller; secretary-treasurer, Dr. F. D. Dodge; executive committee, Durand Woodman, Wm. McMurtrie, M. T. Bogert, and M. Toch.

In response to a letter from the Mayor, requesting a list of 10 names of members of the New York Section from which to select one member of the commission to regulate the sale and storage of combustibles and explosives, the following list was unanimously approved: Chas. F. McKenna, R. C. Schupphaus, C. W. Volney, Wm. McMurtrie, Thos. J. Parker, James Hartford, A. A Breneman, Maximilian Toch, A. H. Sabin, and Durand Woodman.

A motion was made to withdraw from the Scientific Alliance, and considerable discussion resulted. Action on the matter was postponed until the October meeting.

The following papers were read:

P. A. Levene: "Recent investigations upon the chemistry of the proteid molecule," by title.

F. J. Metzger: "A new separation of thorium from

cerium, lanthanum and didymium, and its application to the analysis of monazite."

H. T. Vulte and Harriet W. Gibson: "Solubility of various resinates in hydrocarbon oils," by title.

E. B. Voorhees: "A study of denitrification by means of cylinder experiments." (Second paper.)

ENGINEERS' CLUB OF ST. LOUIS.—At the meeting on May 21, 22 members and 8 visitors were present. Dr. Herman von Schrenk addressed the club on "The Relation of Forestry to the Engineering Profession." A few figures were given, showing the enormous amount of timber used in the country. The gradual exhaustion of several of the most useful varieties of timber, and the consequent increase in their price, has brought about experiments and investigations to secure substitutes. This is especially the case in the northeastern part of the United States. A case was cited of one railroad which no longer buys white oak ties, but imports ties of another variety from Canada. The replanting of denuded areas, the rational cutting of timber in present forests, and the treating of timber to increase its life are methods for preventing the exhaustion of the timber supply. The steps being taken in Eastern States to replant trees were described, some of the States making annual appropriations. Trees are also being planted on barren areas in Western States. One large railroad system had recently been induced to cut the timber for ties from a large area in accordance with the principles of forestry and under the direction of the Bureau of Forestry. Rational cutting of timber means cutting only those trees which would not increase in value if allowed to stand. The rotting of timber requires the presence of both air and moisture. Timber when completely submerged in fresh water is preserved in its original strength for ages. Specimens were shown of timber which had been exposed to the air in dry localities, and which appeared to be perfectly preserved. Railroad ties, telephone and telegraph poles and the timber in docks, flumes and paving blocks were given as examples in which rotting occurred at high rates. An outline of the methods of treating timber to prevent rotting was given, and specimens of the treated timber were shown. One specimen, a section of a tie from a European railroad, had been in service 30 years. It appeared to be serviceable for an additional 30 years.

The work of the Bureau of Forestry was outlined. A number of examples were given of their successful efforts in securing the co-operation of large corporations in extensive experiments. The speaker urged the co-operation of all engineers in the work of the Bureau of Forestry, and stated that great assistance could be given by calling the attention of the bureau to unusual cases in the decay of timber.

In the prolonged discussion which followed, Messrs. Klauder, McAdam, R. D. O. Johnson, R. H. Phillips, Van Ornum, Chaphe, Hiram Phillips and others participated.

INDUSTRIAL NOTES.

The George V. Cresson Company, of Philadelphia, Pa., is reported to have lately taken a substantial contract for power transmission.

The Risdon Iron Works, of San Francisco, Cal., has just completed a new 20-stamp mill for the Gwin Mine in Calaveras County, Cal.

The American Air Compressor Works, of New York City, recently received a rush order for air compressors for shipment to Johannesburg, South Africa.

The American Pulley Company, of Philadelphia, Pa., is reported to have recently secured some good-sized contracts for shipment to Mexican and Australasian ports.

Crane Company, of Chicago, Ill., has made a shipment of about 10 car-loads of pipe, etc., to East London, South Africa, which will be utilized in the mining district around Johannesburg.

The Tidewater Steel Company and the Suburban Gas Company have entered into an agreement to erect 60 by-product coke ovens with an estimated output of 300 tons a day at Chester, Pa.

The Utah Mining Machinery and Supply Company, of Salt Lake, Utah. J. E. Galigher, manager, is now open for business. The company is located in the old Oregon Short Line Building, where it has a floor space of 8,000 sq. ft., besides the basements.

The Begeer improved cyanide process will be used at the cyanide plant of the Last Chance Mining Company at Mogollon, N. Mex. This improvement is already used in a number of cyanide plants in the West.

The Atlas Portland Cement Company, of Northampton, Pa., one of the largest cement works in the country, has just sent the Burt Manufacturing Company, of Akron, O., a fifth order for oil filters, making 9 large Cross oil filters now in use in the works.

The Pittsburg Reduction Company will build a large aluminum plant at Massena, N. Y., and take power from the St. Lawrence Power Company. A site of 100 acres has been secured, upon which two buildings covering 15 acres will be erected, to cost about $500,000.

A plant is being erected at Niagara Falls, N. Y., by the Oleo-Naphthal Company, of that city, for the manufacture of a non-toxic liniment and antiseptic dressing. The process, which is partly an electrolytic one, is the invention of Steward Steele, of San Francisco, Cal., who has assigned his rights to the above company.

The Babcock & Wilcox Company, of Bayonne, N. J., has received an additional contract for 16 boilers for the Metropolitan District Traction, Limited, of London, Eng., representing some 8,000 h. p., making a total of 64 boilers aggregating 34,000 h. p. The electrical equipment for the plant will be of Westinghouse type.

James A. Kilton, it is stated, has secured a concession for the construction of metallurgical works at Matehuala, San Luis Potosi, Mex. The plant will have a capacity to smelt 100 metric tons of ore daily. The furnaces, buildings, etc., will entail an expenditure of $100,000 gold. The works are to be in active operation, it is stipulated in the concession, by the end of 1903.

The Old Jordan Mining and Milling Company, of Salt Lake, Utah, owning the Chicago & Bingham Mine, at Bingham, Utah, has placed an order with the Acme Machinery Company, of Salt Lake, for a 40-h. p. steam hoist and a 30-ton concentrating mill. The plant will embrace a Wallace stamp mill, rolls, and New Standard table, with boiler and engine separate from those used for the hoist.

Recent sales of the engineering department of the Pittsburg Gage and Supply Company, of Pittsburg, Pa., include 2 350-h. p. water-tube boilers, with stokers and coal conveying apparatus for the Montrose pumping plant, Allegheny City, Pa.; a 1,000-h. p. Patterson-Berryman water heater, for the Whipple Colliery Company, as well as a 125-h. p. Patterson-Berryman water heater for the Lake Erie Limestone Company.

The Philadelphia, Pa., Pneumatic Tool Company has removed to its new plant at Twenty-first street and Allegheny avenue. Some recent shipments by the company include pneumatic rammers to Jones & Laughlins, Limited, Pittsburg, Pa.; the Lackawanna Steel Company, Buffalo, N. Y., and to a number of other plants. Large numbers of pneumatic riveters, hammers and chippers are being shipped to railroads and machine shops.

Charles H. Besly & Company, of Chicago, Ill., report business as very good. They are receiving orders for Gardner grinders with spiral grooved disks from all parts of the United States, especially from the West and Northwest, and their factory at Beloit, Wis., is taxed to its utmost to meet the demand. Owing to the increasing demand for Helmet temper taps new machinery has been installed at the factory to aid in promptly filling orders.

The Lidgerwood Manufacturing Company, of Brooklyn, N. Y., has secured a contract for electric hoisting equipments from the United Engineering Company, of Johannesburg, S. Africa. The hoists are intended for use in the mines.

The Lidgerwood Manufacturing Company also obtained a contract through the General Electric Company for hoisting engines, to be operated by electric motors, for the English market.

The Standard Construction Corporation, Limited, of Amberley House, Norfolk Street, Strand, London, Eng., which has the contract for the construction of a railway between the Dunderland Iron Ore Company's Norwegian mines and the seaboard, is stated to have given the Ingersoll-Sergeant Drill Company, of Easton, Pa., a good-sized contract for rock drilling equipments, and the Lidgerwood Manufacturing Company, of Brooklyn, N. Y., an order for several hoisting engines.

The Allis-Chalmers Company, of Milwaukee, Wis., recently received an order for 5 blowing engines from the Carnegie Steel Company, to be installed at the furnace plant to be built in the Pittsburg district, and 1 for the Joliet plant of the same company. The erection of the new works at West Allis, Wis., is progressing rapidly. Contracts were awarded recently for 6 additional buildings which will contain 3 additional shop units. The machine shop is already in operation.

The Weber Gas and Gasoline Engine Company, of Kansas City, Mo., states that business continues very good, showing a steady increase during the first 5 months of this year. It is running its plant at full capacity and the prospects for future business are very encouraging. It has lately completed an addition to its foundry, increasing its capacity 50 per cent., has also erected another iron building for the wood-working department, and another iron building for the galvanized iron department.

The Holthoff Machinery Company, of Cudahy, Wis., has completed its new plant, comprising boiler shop 100 by 250 ft.; machine shop, 110 by 250 ft.; pattern shop, 80 by 120 ft., and an office building of 2 stories. The machinery is practically all delivered and in place. Among the equipment are 2 20-ton Pawling & Harnischfeger electric cranes. The boiler plant has the heaviest and latest machinery for all kinds of boiler and heavy sheet metal work. The company will build internal fire boilers and make a specialty of heavy tank and similar work. The company reports the outlook for business as very flattering.

At the annual meeting of the Lake Angeline Dock Company, in Pittsburg, Pa., recently, the old directors were re-elected. They include: James Laughlin, Jr., B. F. Jones, W. W. Willock, H. A. Laughlin, B. J. Jones, Jr., G. M. Laughlin and James B. Laughlin. The officers are: James Laughlin, Jr., president; W. W. Willock, vice-president; John L. Moore, secretary-treasurer; W. G. Pollock, general manager; James Laughlin, Jr., B. F. Jones and George M. Laughlin, executive committee. The company owns ore docks at Marquette, Mich.

The Curtis & Curtis Company, of Bridgeport, Conn., states that in its Forbes die stocks the shell or casing is now so adjusted that the wear of gear is taken up. As is well known, in many machines for cutting and threading pipe the gear wears itself loose in the shell after a time, so that a perfectly straight thread is not easily obtained. The company states it has wholly overcome this difficulty in the Forbes die and stock. The dies used are stated to be cheaper than solid dies and much more durable. All parts of the machine are interchangeable.

TRADE CATALOGUES.

Van Voorhis & Sanford, of Monterey, Mex., issue Catalogue No. 12, an 80-page pamphlet, describing the machinery and supplies for mines and mills that they carry in stock. The catalogue is printed in English and Spanish.

Standard walking beam outfits, portable boilers, oil-well engines, forge and casing tools are described in a 20-page price list sent out by the St. Louis Well Machine and Tool Company, of St. Louis, Mo. The company's drilling outfits are for sinking oil, gas and artesian wells, from 1,000 to 3,000 ft. deep.

The Burt Manufacturing Company, of Akron, O., has issued a catalogue describing the Cross oil filters. It contains a long list of leading concerns in this and foreign countries who are using from one to as many as 100 of the filters. The Burt Company reports an unusually brisk foreign trade in its goods this season.

The Dimmick system of concentration and the Dimmick classifier are described in circulars sent out by the Mine and Smelter Supply Company, of Denver, Salt Lake, El Paso, City of Mexico, and New York City. The Dimmick classifier operates on the old principle of falling particles of pulp through water, and the manufacturers claim that by its use from 2 to 10 distinct sizes can be made from coarse sand to very fine slime, either size being constituted of particles of the same weight. It requires no additional water, and has no moving or wearing parts, while its capacity is 50 tons per day.

Catalogue No. 4, published by the C. O. Bartlett & Snow Company, of Cleveland, O., is a pamphlet of 140 pages, describing the chain belting and sprocket wheels the company manufactures. The chains shown embrace a great variety of sizes, while the attachments include more than 500 patterns. The company manufactures special malleable chains, also Locke tempered steel chains and attachments. Illustrations show the company's Triumph Common Sense conveyor and elevator at work handling hot ore, coal, cinders, broken rock, etc.; also gravel at placer mines, where the hydraulic process can not be used.

Steam pumps for a wide variety of purposes are shown in a 48-page pamphlet published by the Canton Pump Company, of Canton, O. The pumps are of the inside plunger design, the plungers being packed with a soft, fibrous packing, which remains stationary, and is easily accessible by removing the outside head of the pump barrel. The plunger and piston rods are connected at the center by a compression coupling, which makes it possible to use brass rods on end and steel rods on the other, while either can be taken out or replaced independently. The company states that in the design of its pumps great care has been taken to have all parts readily accessible, while the workmanship is unsurpassed. The pumps range in size from boiler-feed pumps to large mine pumps, and pumps for great pressures. The company also manufactures pumps for acid works and for heavy liquids and boilers of best open-hearth steel. The pamphlet contains some useful tables on losses due to friction, capacities of pump cylinders, etc.

The Standard Diamond Drill Company, of Chicago, Ill., has issued its 1902 catalogue, a pamphlet of 84 pages, describing its diamond drills for prospecting mine and mineral land. The company states that it has retained the services of engineers formerly in the employ of the M. C. Bullock Manufacturing Company, and can offer the services of diamond drill operators formerly connected with that company. The company

states also that its drills represent the result of 35 years' experience in diamond drill construction. The capacity of the drills ranges from a hand-power machine, capable of driving a 1⅝-in. hole 350 ft., to a powerful machine, fitted with tandem compound engines, that will bring a 2-in. core from a hole 6,000 ft. deep. The company states that its drills, except the smallest size, are regularly equipped with specially designed engines, equally well adapted for using steam or compressed air, but that any of the drills can be run by electric power by substituting for the engine an electric motor designed to work the drill. The drills may be had fitted with either screw feeds or an improved double-cylinder hydraulic feed, and have a hinged swivel head. Full specifications of the various drills are given in the pamphlet, with prices of various parts, estimates of the cost of diamond drill work, and instructions for operating drills and setting diamonds.

GENERAL MINING NEWS.

Chesapeake & Ohio Railway Company.—The coal and coke shipments in April and the 10 months of the company's fiscal year are officially reported as below, in short tons of 2,000 lbs.

	April.		10 months.	
	Coal.	Coke.	Coal.	Coke.
New River	390,011	34,795	3,509,216	321,355
Kanawha	100,114	12,462	1,143,495	85,358
Kentucky	7,023	...	116,304	...
Total, tons	497,148	47,257	4,769,015	406,713
Connecting roads	...	...	28,078	3,207
Grand total	498,093	47,257	4,797,093	409,920

Compared with last year, the coal shipments in April show an increase of 46 per cent, or 156,305 tons, and the movement of coke 32 per cent, or 11,446 tons. In the 10 months of the present fiscal year the shipments of coal increased nearly 13 per cent, or 537,133 tons, and coke 23 per cent. The appreciation in the movement of coal is due principally to the heavier Eastern demand.

ARIZONA.

GRAHAM COUNTY.

(From Our Special Correspondent.)

Prospectors report rich gold and silver claims in the Santa Teresa Mountains, 16 miles from Thomas, and have made a deal with Capt. McEwing to work 6 claims.

PIMA COUNTY.

(From Our Special Correspondent.)

The ledge in which the gold discovery was recently made in White Picacho District by Scott, Gilbert & Rowe is reported 60 ft. wide, and everything taken out of a cross-cut is said to average $5 and $6 gold to the ton, with 4 ft. veins going $16. Work is progressing on 2 50-ft. shafts.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

Empire & Pacific.—The dumps of these mines at Plymouth have been leased by W. E. Dargie, of Oakland, H. C. Crain, Wm. Axford and C. Wild, who are to pay a fourth of the gross proceeds. The dumps were recently purchased by Senator Dargie from Frank J. Moffitt. There are 4 5-ft. Huntington mills crushing the material.

Gover.—At this mine at Amador City, owned by the Fremont Mining Company, C. E. Purrington superintendent, a concrete foundation is being constructed for the new air compressor.

Horn.—At this mine, near Defender, the tunnel has still 100 ft. to run to tap the ledge. The small vein is high grade.

Kennedy Mining and Milling Company.—The famous mine at Jackson, J. F. Parks superintendent, will shortly have a fine equipment for the new East shaft, now down 2,500 ft. The cross-cuts from the 2,400 and 2,500 ft. level are now run about 500 ft. A mill will be erected this year. A third boiler and a second air compressor have been put in.

Keystone Consolidated Mining Company.—At this property at Amador City, Chas. Bunker superintendent, the new Norwalk compressor is in use. The 60 stamps are all busy.

Lincoln.—The shaft on this mine at Sutter Creek, E. C. Voorheis manager, is down 2,036 ft. A large sum has been spent opening this mine without any return from ore, as no mill has been built.

Mitchell.—At this mine, near Pine Grove, Superintendent Hyner expects to have the new 20-stamp mill ready to run by June 30.

Rhetta.—An extension of the bond on this mine at Plymouth has been granted and a payment made.

South Spring Hill Gold Mining Company.—This company intends to spend on the mine at Amador City, John R. Tregloan superintendent, $250,000 for a shaft, buildings and other improvements.

BUTTE COUNTY.

(From Our Special Correspondent.)

Brasleton Ranch.—R. S. Grant has leased a portion of this ranch near Oroville, and is putting in a hydraulic elevator. I. N. Lange has leased a part of the McPherson Ranch, nearby, and is to start mining.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Calaveras.—This group of claims, between Murphys and Sheep Ranch has been bought by J. D. Olson, of San Francisco, Cal., and work has started. A modern plant is to be erected.

Lavagnino Mill.—John Lavagnino is about to erect a custom mill on Angels Creek at Angels.

Mitterbauer.—This mine, near Mokelumne Hill, owned by Charles Mitterbauer, has been bonded, and machinery has been shipped to resume work.

Montana.—The mill of the old Orchard Mine is being removed to this mine, about 7 miles from San Andreas.

Oroville Gold Producing and Exploration Company.—This company has paid $250 per acre for farming land near Jenny Lind, near the Calaveras River. Dredges will be put on the ground.

Reliance.—This mine, at Mokelumne Hill, A. C. Aiken, of San Francisco, owner, has started up, as well as the 4-stamp mill.

ELDORADO COUNTY.

(From Our Special Correspondent.)

Golden Queen.—On this mine at Kelsey, Philip Stingle superintendent, the tunnel is now in 200 ft.

Montezuma.—On this mine at Nashville, J. C. Heald owner and superintendent, a ledge of good ore has been found on the 300-ft. level.

Union Mining Company.—This company's property at Eldorado, A. Harpending superintendent, and Judge Williams manager, includes the Amador, Springfield, Church-Union and Pride of the Hills mines. Arrangements have been made to sink deep. At the 500-ft. level drifts will be run into virgin ground.

Zantgraf.—A contract has been awarded for a new mill at this mine, owned by the Montauk Consolidated Mining Company, of 45 Broadway, New York. Edwin Goodwin, of Loomis, is superintendent, and D. H. Coles, of Auburn, manager.

FRESNO COUNTY.

(From Our Special Correspondent.)

Paradise Mining Company.—D. Michaels, of Selma, has gone to Sycamore Creek to start up the new hydraulic plant. Three miles of flume are completed.

Wabash Mining Company.—This Los Angeles mining company, owning ground near the Copper King Mine, near Letcher, J. H. Dockweiler, of Los Angeles, superintendent, has received word that the decision of the Commissioner of the General Land Office has been confirmed, throwing out 6 claims which had been filed on the company's property by "scrippers."

KERN COUNTY.

(From Our Special Correspondent.)

Gold Bug.—From this mine, near Searles, the Teagle Brothers are getting out high-grade ore, which is treated at the 2-stamp mill at Garden Station.

Old Cowboy.—A half interest in this claim at Amalie, owned by W. H. Williams 2 years ago, has been sold, and development work is to start.

Rayo Mining and Development Company.—This is a Los Angeles company, of which A. C. Le Baron is secretary and F. M. Stone superintendent. It owns the 6 claims near Kernville, which it is planning to open. Three of the mines carry antimony. An electric plant is to be installed and power is sold to adjacent mines.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Black Prince.—This mine is being opened by J. W. Brockman and associates of Bakersfield, and some of the ore is high grade.

Colorado-Mexico Company.—This company has started work on an electric plant at Broadhead, near Bagby, on the Merced River. A large stone and cement dam is to be built. The company is to sell power to mines.

Mariposa Mining and Commercial Company.—The new electric plant on the Merced River at Bagby is completed and satisfactory tests made of the line to the mines at Mount Bullion and Mariposa. Power has been expensive, the cost of hauling wood being $3.50 per cord. The 30-stamp mill at the Princeton at Mount Bullion is to be enlarged to 50 stamps, and 10 stamps will be added to the 20 at Mariposa. The two mines now employ 250 men.

MERCED COUNTY.

(From Our Special Correspondent.)

Buckley Ranch.—I. J. Buckley, of Snelling, has bonded his 300-acre ranch at $40 per acre to men who will prospect for gold. It is many years since any mining was done in that region, and Merced County has not been a gold-producing county for a long time.

NEVADA COUNTY.

(From Our Special Correspondent.)

Empire.—The new Norwalk air compressor for this property at Grass Valley, George W. Starr manager, weighs 18 tons, and is the largest ever received in the district.

Gold Ridge.—This mine is to resume under the direction of Marcus Baruh, of Nevada City. The mine has been sold by Richard Phelan, of Sierra City, to A. Zellerbach & Sons, of San Francisco.

PLACER COUNTY.

(From Our Special Correspondent.)

Baltimore & Hope.—These claims at Forest Hill have been bonded by Mrs. Reamer to Mr. Westall.

Haskell.—At this mine, near Auburn, E. C. Gaylord has men cleaning out and re-timbering the lower tunnel. Harold T. Power, of Michigan Bluff, now controls the mine.

Patrick Quartz Mining Company.—At the mine at Westville, George Strong superintendent, the company is putting up a 20-stamp mill and employing 15 miners.

Sellier.—The tunnel at Forest Hill, Harold T. Power manager, is in 1,600 ft.

Spring Garden Tunnel.—The tunnel at Spring Garden is being driven ahead by Gen. Hart and the men who have the bond on most of the ground between Forest Hill and Butcher Ranch.

PLUMAS COUNTY.

(From Our Special Correspondent.)

Hall.—The claim on the North Fork of Feather River, belonging to the estate of James Hall, has been sold to W. R. Gunderson, of Quincy.

Secret Diggings.—Sam Ah Tye, a Chinaman, has applied to the California Debris Commission for permission to work by hydraulic process this claim, near La Porte.

RIVERSIDE COUNTY.

(From Our Special Correspondent.)

Pacific Clay Company.—J. H. McKnight has sold some clay beds near Corona to the Pacific Clay Company, of that place, for a reported price of $15,000.

SAN BENITO COUNTY.

(From Our Special Correspondent.)

Cerro Bonita.—These quicksilver mines, near San Juan, are to be developed by Senator Thos. Flint, of Hollister; H. R. Bradford, of San Jose, and others. The formation and conditions are considered similar to those of the New Idria mines, further south.

Pichachitos Mining Company.—The quicksilver claims near New Idria, owned by Wm. A. Stuart, of San Francisco, O'Donnel Brothers, of Hollister, and L. B. Ulrey, of Kings City, have been consolidated under this name.

Stayton.—At this quicksilver mine, Sidney Smith, of Gilroy, manager, mining will soon start. Men are repairing the buildings, tunnels, etc. The mines were shut down some years ago for lack of funds.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

Douglas & Griffin.—These 2 lepidolite mines at Pala were owned by Frank Salmons, of Oceanside, who has sold a half interest to Gay & Blakely, of Redlands.

Free Gold Mining Company.—This company, own- April 20, increased the capacity of the cyanide plant by raising the height of the leaching tanks to about 400 tons per day.

Lepidolite Mines.—The Stewart & Mission lepidolite mines, near Pala, in the upper San Luis Rey Valley, have been sold by Nelson G. and Addella Douglas and R. O. Butterfield to the People's Mutual Mining Company, of New York City. The mines have been in litigation some time. The product has been shipped to New York.

SAN LUIS OBISPO COUNTY.

(From Our Special Correspondent.)

Madrone.—This quicksilver mine, in Josephine District, is turning out about 100 lbs. of mercury daily.

Karl.—This quicksilver mine at Klau is employing 75 men, and work will shortly be increased.

SANTA CLARA COUNTY.

(From Our Special Correspondent.)

Santa Teresa.—This quicksilver mine, 3 miles from New Almaden, is being reopened under Superintendent R. B. Harper, and a new furnace is being built. The property has been idle many years.

Silver Creek.—These quicksilver mines, near Evergreen, will begin roasting ore shortly. The new furnace is completed.

SHASTA COUNTY.

(*From Our Special Correspondent.*)

Bully Hill.—At this copper mine at Winthrop, the force is to be increased soon, when the extra converter at the smelter is in operation.

Detroit & California Mining Company.—This company has opened its offices at Redding, and intends dredging the Wynne placer ground near Horsetown. It is an off-shoot of the Heintz Gold Extraction Company, and Dr. T. R. Heintz is president and manager.

Mount Shasta Gold Mines, Limited.—At this property at Shasta, F. E. Ware manager, 80 men are employed.

Oro Fino.—This mine, on Clear Creek, at Shasta, has been sold to a company of Santa Rosa men. Wm. Moran will be in charge. The ore is to be shipped to the smelters at Keswick.

SISKIYOU COUNTY.

(*From Our Special Correspondent.*)

Clifton.—The new mill on this mine, near Gottville, H. B. Kelley superintendent, will shortly start.

Maybell.—Mr. Trowbridge, of this mine, near Scott Bar, has leased the 5-stamp mill on the Columbia Mine, adjoining, to crush his ore.

Salmon River Mining Company.—This company at Cecilville will build a new 3-mile flume this summer.

SONOMA COUNTY.

(*From Our Special Correspondent.*)

Culver-Baer.—The office of this quicksilver mining company is to be removed to Santa Rosa, A. V. McNab and D. C. Page, of that city, having acquired the Culver interests. The mine has a furnace and is a producer.

STANISLAUS COUNTY.

(*From Our Special Correspondent.*)

La Grange Dredges.—Messrs. J. E. Doolittle, E. A. Wiltsee and others have a steam drill at work at La Grange and 2 more are to be added. Over 17 miles of ditch will be built to carry 5,000 in. of water, and an electric plant is to be put up at La Grange. The 1,400 acres of gravel land for dredging are being prospected by the drills.

Martel Mining Company.—This company has filed articles of incorporation. The directors are A. F. and Emma Martel and W. J. Gerard, of San Francisco, and J. J. and A. E. Cummings, of Oakland. The deposits of magnesite to be opened are back of Westley, in the Coast Range.

TUOLUMNE COUNTY.

(*From Our Special Correspondent.*)

Bell.—This mine at Tuttletown has been bonded to W. J. Rule and G. Buell, of Stockton.

Big Casino.—In this mine, near Groveland, Superintendent O'Brien is cross-cutting for the ledge.

Confidence Mining Company.—On the property at Confidence, Neil Carmichael superintendent, excavations for a 100-ton cyanide plant are under way. A new 60-h. p. boiler, Rix air compressor and 2 air drills are being added.

Hard Tack.—Hugh J. Thomas has resigned as superintendent of this mine at Carters, and Chas. Connolly succeeds him.

La Preciasa.—Felix Chappelet, Jr., of the Mohican Mine at Carters, has bought this claim adjoining the Mohican. A company is to be formed to open it.

Mack Consolidated.—This company, at Big Oak Flat, has given a mortgage for $55,564 for one year to Walter J. Wayte.

Shoenburg Mining and Milling Company.—This company has secured the Nichol Mine, near Groveland. M. C. Dale, superintendent, has started work.

COLORADO.

BOULDER COUNTY.

Boulder Oil Wells.—The total number of wells that have found oil is given as 16, as follows: Boulder Basin, McKenzie, Wellington, Boulder-North Bend, McAfee and Republic, capacity 30 bbls. a day each; the Ohio, Bradford, Alamo, Arnold, Keystone, Crawford, Carnahan, Cleveland and Blue Jacket, an average producing capacity of 20 bbls. a day.

CLEAR CREEK COUNTY.

(*From Our Special Correspondent.*)

Clear Creek Light and Power Company.—This company has made a number of improvements in its plant at Georgetown and acquired additional water rights. Control in the company has passed to F. E. Himrod, of New York City, owner of the Lamartine Mine at Idaho Springs, and Lafayette Hanchett, of Idaho Springs, manager of the Lamartine Mine and Newhouse Tunnel, who are exclusive owners of the Cascade Electric Company, of Idaho Springs, which connects with the plant at Georgetown, 12 miles away. A contract has also been made with the Gilpin County Company, lighting Black Hawk and Central City, to supply it with power and electricity, and the line is now under construction from Idaho Springs to Central City. Headquarters will probably be at Idaho Springs, although Fred Dewey, of Georgetown, is yet manager. The company is putting in another 300-h. p. generator at Georgetown, and stringing another line of poles and wire from Georgetown to Idaho Springs. Power will be supplied to various mines. It is also understood that the new owners have in view a power plant in Grand County and may run wires 70 miles to the east side of the divide at Georgetown.

Independent Samplers.—There will be no independent sampler in Clear Creek County in opposition to the Chamberlain-Dillingham samplers. The railroad companies made a rate of $4 from Gilpin and Clear Creek counties to the Black Hills smelters and then withdrew the rates because of a request from the American Smelting and Refining Company. The Golden Smelter had tried to buy sulphide ores at lower rates than offered by the smelters but is not making any great effort to buy mineral. According to reports it was asked not to cut rates. There has been no material advance in treatment charges since the Chamberlain merger.

Kokomo-Pioneer Mining and Milling Company.—This property at Dumont is again in trouble with several parties trying to gain control. Boston men have spent $160,000, but through carelessness allowed the property to revert to the original owners after almost paying for it and spending $50,000 on a new mill. Their interest has been attached for wages and bills. The Pioneer Mill, Pioneer Mine, Milton Mine and Kokomo Mine were in the holdings. The company has been poorly managed throughout.

Monarch Mining, Milling, Power and Tunnel Company.—A vein of good mineral has been cut in the tunnel started about a year ago to reach the Freeland Mine, and now in about 2,000 ft. An immense flow of water is coming from the bore.

Shafter Mining Company.—The shaft-house was destroyed by fire. Loss $4,500. The insurance, $2,700, has been paid. It is stated by Manager A. H. Roller, of Idaho Springs, that the shaft house will probably be rebuilt, although the Central tunnel will cut the vein at 900 ft. depth in a few months. The mine has a large territory blocked out with thousands of tons of mill ore broken down.

FREMONT COUNTY.

Page Mill.—Silverton mining men have taken a $15,000 bond and lease on this mill at Florence, near the Rocky Mountain Smelter. The present capacity of the mill is 50 tons a day. It is expected that the work of enlarging the plant will be commenced about the middle of August. The mill has been in litigation since the day it was built, and for 3 years there were a dozen claimants. The plant uses a chlorination process.

Rocky Mountain Smelter.—Edward J. Seeley and W. K. Johnson, of Denver, have announced that as soon as their proposed lease on this smelter at Florence is secured they will begin improvements that will cost $100,000. Three new lead furnaces and roasters will be installed.

GILPIN COUNTY.

(*From Our Special Correspondent.*)

Mining Deeds and Transfers.—E. M. Stedman to F. S. Brown, the St. Edman lode, Pine District; L. P. Arrighi to Ernest Dalseglio, the Dump lode, Gregory District; J. L. Walters to the Bullion Mining, Milling and Development Company, the Tillman lode, Pine District; W. S. Deisher to A. J. Smith, half interest in Florence D. and Grace D. lodes, Russell District; Mrs. Amanda M. Schuyler et al to I. C. Schuyler, the Cataract lode, Russell District; Henry Davis et al. to Michael Notarfrancisco, half interest in Mary Ann, Lucky Boy, Logan and Idaho lodes, Bay State District; J. W. Baldwin et al. to the Keystone Gold and Copper Company, the Texas and Klondyke lodes, Russell District; C. B. Wilkinson to Emma E. Bingham, half interest in Delamite and Hepmatite lodes, Silver Lake District; G. A. Buchanan et al. to J. W. Lambert, one-eighth interest in Johnny and Adelbert lodes, Bay State District.

Hall.—A lease and bond for $35,000 has been given on this lode, in Russell District. The property has been developed by a shaft only 75 ft. deep, but the milling ores go from 2½ oz. gold per cord, and the smelting ores over $100 per ton. The property is owned and operated by Isaac Hall, of Russell Gulch, who discovered it less than a year ago.

Kansas-Burroughs Consolidated Mining Company.—The shipments during May to stamp mills, concentrator and smelters were 2,465 tons, an average of over 80 tons daily. Some of the ore shipped to the Golden Smelter gave very satisfactory returns. Over 100 men are at work under P. McCann, Central City.

Ohio.—This group of 2 claims in the Pleasant Valley District has been sold by local men to Joseph Milligan, of Pennsylvania, for $10,000. The main shaft is down a little over 100 ft., and the developments have been quite satisfactory. Heavier operations will follow, and larger machinery will be installed. Mr. Milligan, Central City, will be in charge.

Old Town.—Daily shipments average 50 tons, half of which is shipped by tramway and the other half by wagon to the Idaho Springs mills. The property is making money. About 50 men are employed under the management of G. K. Kimball, Jr., Idaho Springs.

Pendleton.—Boston men have taken a lease and bond on this property, situated in Russell District, and are preparing to install machinery. The shaft is down 175 ft. The property has been idle over 30 years, but is credited with producing some very good surface ores. W. Ballantine, Central City, is to be in charge.

LAKE COUNTY—LEADVILLE.

(*From Our Special Correspondent.*)

Leadville Ore Output.—The output is 2,250 tons a day of all classes of ore. The iron production is very heavy again.

A. M. W.—The June output figures are A. M. W., 8,000 tons; Midas, 5,360 tons, and Minnie, 2,600 tons. There will be a large increase as soon as the new $25,000 mill at the Minnie is completed.

Caribou Mining Company.—Geo. Champion has increased shipments to 100 tons a day of good iron ore.

Corona.—New lessees headed by James Condon have sunk this new shaft near the Minnie 140 ft. Machinery is to be put in immediately and sinking resumed.

Fryer Hill Mines Company.—The big 1,400-gal. pumps have started. It will take some months to drain this ground entirely, but work in the upper levels of the Dunkin will be resumed sooner.

Garbutt.—From fissures in the porphyry a large amount of ore was extracted, but no great bodies were located and the mine closed this week.

Gold Basin Mining Company.—Occasional shipments are made, the ore being very rich and running $300 gold to the ton. The company is after the main Big Four shoot.

Haphazard Mining Company.—At 200 ft. sinking stopped, and a drift is being run on the vein.

Helen Gould.—The tunnel is in 248 ft. and the copper vein has widened considerably.

Homestake Mining and Leasing Company.—The vein being followed is better. Shipments will start this week.

Last Chance.—A new shaft is started on this Yankee Hill property. Drifts will be run at 150 ft. Peter L. Kimberly, of Sharon, Pa., is back of the enterprise.

Louise.—San Francisco people who recently purchased about all the stock of the old company are sinking a new shaft. They have a good gold ore showing and a large acreage of virgin territory. A mill will be erected this summer.

Lucy L.—This Tennessee park property will be worked by George Cottingham. Diamond drill holes will be put down before sinking the shaft.

Midas.—This mine, which has for several years been shipping 200 to 250 tons daily of $4 to $5 iron ore, shows no signs of exhaustion, and its lower levels are yet to be opened up and developed.

Nayr Mining Company.—At 700 ft. in the sulphide contact a drift is opening large bodies of concentrating material. Values are improving, especially in copper, which shows 14 per cent. The drift is after the Imes ore shoot.

New Elkhorn Mining Company.—This London company has ceased mining here and has torn down its fine shaft houses.

New Leadville Home Mining Company.—The Starr and Bon Air territory has not yet been leased. Shipments from the Penrose claim in May were 5,000 tons.

New Valentine Mining Company.—It is expected that $25,000 will be raised and work will be resumed. The new officers are E. J. McCarty, Leadville, president; W. E. Hawks, Vermont, vice-president; N. S. Gregg, Leadville, secretary-treasurer. This downtown shaft is on Brooklyn Heights.

Ocean Wave.—Work has resumed through the old tunnel.

St. Louis.—Lessees are shipping from the vein ore averaging $90.

Seeley.—At 400 ft. lessees have opened up a good body of iron. Above this iron is galena running 45 ozs. silver and 45 per cent lead, resembling that from the famous Chrysolite nearby.

Ten Mile Leasing Company.—Several large bodies of ore are blocked out and shipments will be regular. Switches are being run from the railroad tracks.

Union Gold Mining and Reduction Company.—New York men, lead by C. A. Foster and J. W. Bailey,

head this company, which has extensive holdings in the Holy Cross section. They will sink 200 ft. deeper at once.

Valley Leasing Company.—The new drift in the upper levels has cut carbonate ore carrying gold believed to be the extension of the Virginins shoot.

Virginius Leasing Company.—Manager N. M. Estey resumes operations. The mines show a fine body of iron ore and can ship 40 tons a day.

Yak Mining, Milling and Tunnel Company.—New machinery has been ordered to push the tunnel 1,500 ft. into Ibex territory. The machinery includes a compound Norwalk air compressor capable of running 12 drills. Two small compressors are now in use. Shipments average 200 tons a day.

PITKIN COUNTY.

Mollie Gibson.—A strike of importance has been reported on the 11th level of this mine at Aspen. It is thought this may be the rich shoot lost in 1896.

TELLER COUNTY—CRIPPLE CREEK.

Lasca.—The terms of consolidation of this mine and the Little Cut Diamond Gold Mining Company have been agreed upon, and the stockholders will vote on the proposition on June 30. The consolidated company will own 35 acres of patented property on Bull and Globe Hills. The acreage will be leased.

Mt. Rosa Mining, Milling and Leasing Company.—This company recently transferred 15.34 acres to the Mt. Rosa Mining Company. The consideration was nominal, but the revenue stamps indicated a price of $77,500.

(*From Our Special Correspondent.*)

Cripple Creek Ore Output.—The record for May is given as 57,850 tons of gold ore shipped. Of this the reduction plants of the district and of Colorado City and Florence received 42,850 tons; the remainder went to smelters at Pueblo, Leadville and Denver. Though the value per ton—about $35—is far lower than in the early days of the camp, yet the total value exceeds all previous records.

Elkton Consolidated Gold Mining Company.—It is reported that the annual meeting will result in a change of management, and the meeting is looked to with interest, as the report of S. W. Mudd, of Leadville, on the water situation at the mine will be made. At present work is going on fairly well.

Granite Gold Mining Company.—A strike has been made on the 1,000-ft. level. From all reports, the owners have a very good thing. The property is situated near the Portland, and was formerly owned by the Moffat & Smith syndicate, but was recently purchased by Messrs. MacNeil, Penrose and others. Dan McCarty is in charge.

Isabella Gold Mining Company.—This property is again creating some interest, and there is no doubt that it is looking better than a few months ago. The strike on the 11th level has not yet proved remarkabue, but some ore is saved, and considerable development work is being done. A number of the lessees are taking out good ore. E. M. De La Vergne has charge.

Maid of Orleans.—Work is temporarily suspended until the new compressor is installed. The property adjoins the Raaler lode, and the management is prospecting for the continuation of that ore shoot. C. N. Crowder, of Cripple Creek, has charge.

Pharmacist Consolidated Mining Company.—McFarland & Ownbey recently shipped 2 car-loads of good ore from their lease. The firm has done a large amount of work, and is taking out a fair amount of ore.

Strong Gold Mining Company.—This company in its answer to the suit filed against it by Stratton's Independence, which charged that it had extracted ore to the amount of $1,750,000 from veins belonging to the Independence, denies all the charges. The properties lie in and near the town of Victor.

IDAHO.

FREMONT COUNTY.

Spring Mountain District.—This district is about 80 miles west of Du Bois, and about 120 claims have been located. Both gold and copper-bearing veins are found. The nearest point on the Oregon Short Line road is 32 miles distant.

INDIANA.

GRANT COUNTY.

(*From Our Special Correspondent.*)

Oil Wells.—The runs from the wells are increasing daily, and the total output for May was 719,753 bbls. The shipments for the same period were 976,547 bbls. The daily average shipment for the month was 31,501 bbls., and the runs were 23,218 bbls.

PARK COUNTY.

(*From Our Special Correspondent.*)

Labor Troubles.—A strike is threatened in the Linton coal-fields. Cars belonging to the Lehigh Valley and Pennsylvania Central roads have been set down at one of the mines in the Linton field, and the miners have protested against loading them, fearing the coal is to be shipped to supply an anthracite market.

IOWA.

MONROE COUNTY.

(*From Our Special Correspondent.*)

Hocking Coal Company.—George W. Seevers, who a week ago bought the mines at Hocking, near Albia, presumably for the Iowa Central Railway, has organized a new company under the same name, the Hocking Coal Company, to operate the mines. The officers are: George W. Seevers, president; Charles E. Lofland, secretary and treasurer, and Frank C. Lofland, general manager, all of Oskaloosa. The retiring stockholders are E. H. Gibbs, W. A. Seevers, Jack Ramsey, Guy Woodlin and J. M. Gibbs, all of Oskaloosa. It is stated that the output of the mines is to be increased. The property includes 2,300 acres of coal from 6 to 7 ft. thick, 2 shafts of 600 tons daily capacity each, a store and a town of about 1,000 inhabitants.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

(*From Our Special Correspondent.*)

Atlantic.—The product for May was 303 tons of mineral. The lode encountered in the cross-cut from the exploratory shaft on section 16 has not yet been identified, though it is believed to be the Baltic. Drifting continues with a reduced force.

Baltic.—William Cole, formerly of the Atlantic Mine, has been appointed clerk of this mine. The May production was 325 tons of metal. Work on the foundation for a new hoist at No. 4 shaft has started. The hoist is from the Nordberg Manufacturing Company, of Milwaukee, Wis., and will be delivered in 6 months. The new Fraser & Chalmers hoist at No. 3 shaft will go into commission in 2 weeks. The shaft is down to the 8th level with the last level being timbered.

Calumet & Hecla.—A number of employes have been discharged in accordance with the policy of the management. Secretary George A. Flagg reports to State Mineral Commissioner Tom A. Hanna of Iron Mountain that the output of the mine in 1901 was 74,510,557 lbs. of copper. This is a decrease over the output of 1900 of 3,250,825 lbs. At present the mills are working full capacity and the daily output in May was 6,000 tons of rock.

Champion.—The output for May was 120 tons of refined copper. Owing to the delay in the delivery of the machinery the mill will go into commission 2 months later than expected.

Globe.—Diamond drill operations at this property, owned by John Stanton, of New York City, will be resumed soon. A standpipe is down 140 ft. for another boring. A lode recently encountered at a depth of 281 ft. is thought to be the Baltic amygdaloid.

Isle Royale.—The mill is stamping on an average 1,400 tons of rock daily.

Osceola.—Nos. 3 and 4 shafts of the Osceola branch, the most northern on the Osceola amygdaloid lode, are closed down and operations at this part of the mine will be confined to Nos. 5 and 6, which are in the richest ground. The output of the 2 shafts closed was 600 tons daily. A number of the men employed in the closed shaft found employment in iron mines at Hibbing, Minn.

Quincy.—The May product was 1,045.5 tons of mineral.

St. Mary's Canal Company.—This company is exploring section 22 with a diamond drill for the Baltic formation. A large amount of work has been done in the past year without result.

Trimountain.—The May product was about 400 tons of mineral, secured from rock stamped at the Arcadian Mill at Grosse Point.

Wolverine.—This mine produced 262.5 tons of mineral in May.

COPPER—KEWEENAW COUNTY.

(*From Our Special Correspondent.*)

Allouez.—The water in the workings on the conglomerate lode is down to the 16th level.

Mohawk.—Sinking is confined to No. 1 shaft at a depth of 700 ft. Nos. 2 and 3 shafts are down 700 ft. each, and No. 4 shaft is down 600 ft. A shipment of 174 tons of mohawkite was recently forwarded to the smelter at Hackensack Meadows, N. J. Work on a new rockhouse at No. 3 shaft is well advanced.

COPPER.—ONTONAGON COUNTY.

(*From Our Special Correspondent.*)

Mass.—The output for May exceeded 150 tons, a large part of which was secured from mass and barrel copper. Underground work is being pushed and as soon as the openings permit the output will be increased. Good copper-bearing ground is showing up in the bottom of the mine, between B and C shafts. Thirty power drills are used.

Michigan.—A cross-cut from A shaft at the 10th level has struck the Calico lode, which at that point of the strike is reported narrow, but well charged with copper. The work of enlarging A shaft is completed to the 1st level. The "branch" vein is reported showing up well where encountered by cross-cuts from the 8th and 9th levels.

MINNESOTA.

(*From Our Special Correspondent.*)

At the annual meeting of the Duluth & Iron Range road at Duluth, the old directors were re-elected, as were the former officers, with the exception of C. P. Coffin, secretary, who is succeeded by H. Johnson, of Duluth. Mr. Coffin remains as treasurer. The fiscal year of 1902-3 is expected to be better than the year 1901-2, the best to date. The road is expected to move more than 5,500,000 tons of ore this year.

The new ore dock of the Eastern Railway of Minnesota is completed. It is an addition to No. 2 dock, and makes that dock 1,500 ft. long, 73 ft. high, 63 ft. wide, with 350 pockets of a total capacity of 87,500 tons storage. It is the largest ore dock in the world, and has cost about $450,000. The road is expected to ship this year more than 4,000,000 tons.

Ore shipments for the season are nearly 3 times those to this date in 1901. If the excess of the 2 months now passed is maintained there will be a total for the season of 24,000,000 tons.

IRON—MESABI COUNTY.

(*From Our Special Correspondent.*)

Ore has been found by the Iron Exploration Company in section 13, T. 58, R. 20, where test-pitting has been under way some time. The land lies west of the new Croxton Mine.

Explorations in section 1, T. 58, R. 19, have been fruitless. The same is true of work in section 9, same town, and in sections 9 and 17, T. 58, R. 18.

A large tract of land on the Western Mesabi has been taken by A. M. Chisholm, of Hibbing, for exploration. Some of the land shows a low-grade ore that was explored by one of the independent steel companies last year and refused. This ore ran about 40 to 50 per cent in iron and is non-bessemer.

Cleveland Cliffs Iron Company.—This company is exploring several leases on the range, including some State lands.

Holman.—This forty, on the west end of the range, that has been found to contain about 4,000,000 tons of 56 per cent ore, is under option for sale to a large Eastern stele-making interest for $400,000. The mine will not be opened for some time, but will be held in reserve; the price is for the fee title.

Minnesota Iron Company.—The Mountain Iron Mine is shipping very heavily, and some ore is now coming from the Aetna part of the property, once the Lowmoor of G. A. St. Clair. The majority interest in the fee is held by the Minnesota Iron Company, as successor to the Lake Superior Consolidated Mines. A great deal of taconite is taken from the sides of the Mountain Iron pit, and several shovels are constantly busy about the mine. Little new stripping is contemplated this year. At the Burt about 150 men are employed in the stripping, but wet and bad weather has been hindering operations. It is not expected much ore will be shipped from the open cut this year. The Clark is shipping about 850 tons, part from the stock pile, but mostly from underground. It is a smaller output than the mine will make when the new engines are in use. The mine has shipped about 30,000 tons this year to date. There remains about 145,000 tons in stock pile. The Chisholm is shipping about 500 tons a day, and 9,500 tons have been shipped to date. The mine is probably good for 150,000 tons this year if pushed hard. The ore going out is all from the shaft: the 5,500-ton stock pile has not been touched. Underground openings are being increased fast. At the Day shipments have started from the 80,000-ton stock pile, which has been on surface for 3 years. The mine has never made much of a shipment, but contains a large deposit. It lies east of the Burt and north of the Sellers. At the Glen, in the Hibbing District, there is already a small stock pile, and development underground is rapid. All ore in stock is coming from development, and no stoping has been done. The Duluth, Mesabi & Northern road is rapidly building a spur track to the mine. When this is completed shipments will start. The property will ship considerable ore this year, though work started but a few months ago.

IRON—VERMILION RANGE.

(*From Our Special Correspondent.*)

It is rumored that the Cleveland Cliffs Iron Company, of the Marquette, Mich., Range, has taken an option on the famous section 30 on the Vermilion Range, and that it will start explorations at once. The terms reported are a 50c. royalty on ore mined, an annual minimum of 300,000 tons, a bonus of $4,000,000 above the royalty when the lease is turned over, and ample time for explorations. These are known to be the terms that the owners, led by G. N.

Lornstorf, have been demanding for some time, but it is doubtful if they get them. Messrs. M. M. Duncan, agent of the Cleveland Cliffs Company, J. O. Jopling, its mining engineer, and Assistant Professor Smythe at Harvard University, have been making careful examinations of this property and other Minnesota lands. If the deal is actually made, or if explorations are carried on under such an arrangement, it will be the highest price ever offered or paid for an undeveloped iron mining property.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—The highest price paid for zinc ore was $34 a ton, for the Kohinoor, Imperial, Sheldoon, Edith, Trouble and Vandalia ore from the Continental land, the Royal Blue ore from the Granby land and the King Jack ore from the United Zinc Company's land. In some instances the price of medium grade ores advanced as much as $1.50 per ton, and there was a general advance of 50c. on medium and low grades. The assay price generally is $31 for 60 per cent ore. Lead ore sold all week at $44.50, but in Galena and Webb City many sales at $46 were reported. During the corresponding week last year the shipment was greater by 530,570 lbs. of zinc and 103,820 lbs. of lead, but the value was less by $16,052. For the corresponding 23 weeks of last year the shipment was less by 8,076,400 lbs. of zinc and 80,880 lbs. of lead, and the value was less by $433,400. Following are the shipments of concentrates from the various camps for the week ending June 7:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,402,410	222,910	$43,398
Galena-Empire	1,082,220	140,680	18,160
Carterville-Webb City	2,668,720	374,570	47,030
Duenweg	1,072,960	107,830	18,493
Aurora	760,820	18,440	10,665
Spurgeon	47,350	41,060	1,279
Alba-Neck City	305,430	8,000	5,065
Central City	156,360	7,500	2,207
Prosperity	312,650	125,540	7,751
Cave Springs	214,910	7,470	3,396
Granby	307,000	41,000	4,375
Carl Junction	310,960	5,131	.....
Wentworth	64,170	.....	1,002
Carthage	246,150	.....	3,988
Reeds-Sarcoxie	125,820	.....	1,887
Springfield	60,000	.....	1,089
Total	10,459,570	1,160,880	$180,341
Total 23 weeks	241,803,190	29,406,340	$3,828,263

Zinc value, week, $154,226; lead, $26,115; zinc value, 23 weeks, $3,224,523; lead, $602,739.

Dividend.—At this mine, on the Midway tract, between Joplin and Webb City, on June 6, Mike Colgen, ground foreman, raised 790 full tubs of ore in an ordinary shift of 9 hours. The ore had all been broken the previous day. There was a run of 355 ft. underground in the drift, the hoist was 100 ft., and there was a run of 110 ft. on the tramway from the hoisting house to the mill. Eleven men worked in the ground and 4 on top. The record is by far the best in the district.

Gussie K.—This mine and mill at Carterville have been sold to J. Allen Hardy for $60,000 cash. The property consisted of a 20-acre 10-year lease on the Chew land south of Carterville, paying royalty at 12½ per cent. There are 2 shafts, one 141 and the other 130 ft. deep. Both shafts are working at 127 ft. on a 17-ft. face of ore. The ore extends to the 147-ft. level. A fine new 100-ton mill was just completed when swept away by the April cyclone. A new mill is up, but is not yet working. The value of the rough ore mined and awaiting treatment is estimated at $12,000. R. A. Katenwein, A. B. Smith, J. B. Varner, A. H. Redding, George Moore, J. H. Van Hoose, and T. F. Coyne, of Webb City, and E. A. Anderson, of Carterville, and Mrs. Sarah Gerkey, of Joplin, were the owners. The mine and mill will be operated by Mr. Hardy, with his sons, George Hardy and J. Allen Hardy, Jr., as superintendents.

MONTANA.

CASCADE COUNTY.

Sand Coulee.—The coal mines at Sand Coulee, 12 miles from Great Falls, after 18 years of continuous work are closed, and will never be opened. The mines belonged to the Great Northern Railroad, and are worked out. The company will continue to develop the coal seams at the town of Stockett, 4 miles distant. The Stockett mines began regular shipments in January, 1898.

(From Our Special Correspondent.)

Silver Belt.—The 1,600-ft gravity tramway connecting this mine at Neihart with the Moulton Mine is about completed. It is to land the ore at a point on the mountain where teams can haul it to the railroad at Queen Switch. During the winter the mountain road to the mine has proved so dangerous to ore hauling outfits that teamsters refuse to make the trip.

FELGUS COUNTY.

(From Our Special Correspondent.)

Yogo Sapphire Mines.—The American Gem Company Berke & Sweeney ground of 12 claims. The price paid is said to be $50,000. The sale was managed by D. Jankower, representing the new owners. The property has been under bond for a year. The gems are found in a trap matrix. The country rock is limestone.

GALLATIN COUNTY.

(From Our Special Correspondent.)

Trail Creek Coal Mines.—These properties, locally known as the Hoffman, situated on Trail Creek, about 20 miles from Boseman, have been bought by the Anaconda Copper Mining Company. President Scallon with a party of friends has made a thorough inspection of the property, which has been under development for some years. The coal makes a coke reported superior to other Montana cokes, and this induced the Anaconda Company to complete the purchase. The mines are reached by a branch railroad from the main line of the Northern Pacific. It is not known whether coke ovens will be built at the mines or the coal sent to Anaconda and coked there. The price paid for the properties has not been given out.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Baltimore.—This property, worked by Butte parties for the past year under a lease and bond, has closed down, and the miners have all received their wages in full. The ore shipments have averaged a car per day, the ore being of low grade. The margin of profit was too small.

Mona.—This property and other claims, 4 miles north of Boulder, belonging to the Rice and Largey estates, has been sold at auction to I. P. Mallett and G. V. McKnight, of Chicago. The purchasers intend to put machinery on the Mona and sink to reach an ore body known to exist on the 300-ft. level.

LEWIS & CLARKE COUNTY.

(From Our Special Correspondent.)

East Helena Smelter.—The executive board of the American Smelting and Refining Company has decided to close these works indefinitely, owing to the late strike, brought on by a handful of workmen who had been discharged for cause. Fully 95 per cent of the 600 and odd employes were satisfied with their work, and how this large majority allowed 38 irresponsible agitators (the number actually present at the strike meeting, and not in the employ of the company at the time) to interfere with their making a living for themselves and families is beyond the ken of the writer. The closing of the works affects fully 15,000 people in the State to a greater or less degree. The Northern Pacific Railroad was receiving anywhere from $600,000 to $1,000,000 annually from the smelter traffic. Already a number of train crews have been discharged for lack of work. The coal and coke industry of the State also feels the closing of the smelter, as certain mines have had to curtail production. A number of quartz mines depending on the works for ore treatment have had to discontinue work, although the smelter company intends to take care of shippers, having leased the old Braden Brothers sampling works, where it will receive ore for shipment to plants at Omaha, Denver, and Salt Lake. The management has always been willing to treat with its employes, but when it came to recognizing the right of outsiders to interfere with its matters, it prefers to dismantle the plant and move it to some point outside of the State.

Missouri River Power Company.—The annual statement filed with the Secretary of State says that the company has ordered material, now en route, valued at $300,000. The company has an authorized capital of $2,000,000, of which $500,000 has been subscribed in cash and $1,500,000 in other ways. The assets are $3,111,500, consisting of the dam across the Missouri River at Canyon Ferry, the electric generating plant, pole lines to Helena and Butte, etc. The liabilities consist of $750,000 in first mortgage bonds, bearing 6 per cent.; $65,000 in bonds of the Helena Water and Electric Power Company, and machinery, water wheels and other appliances ordered, valued at $300,000.

MADISON COUNTY.

Norris Mining Company.—This company has been organized by Baltimore and New York men, with a capital stock of $500,000, in $1 shares. The board of directors comprises F. M. Stitck, of New York; Charles W. Watkins, Albert Boyd and H. B. Tilden, of Baltimore, Md., and Albert Bartes, of Norris. The company has taken the Comstock group of 5 claims, about 2 miles east of Norris. A shaft is down 109 ft. The vein is from 4 to 9 ft. wide, and the ore is a cyaniding proposition. It is said that the directors will erect a 10-stamp combination mill and sink the shaft to the 300-ft. level.

PARK COUNTY.

(From Our Special Correspondent.)

Bear Gulch Mining Company.—It is reported that during May this company at Jardine cleaned up $40,000 from the plates and batteries of the 20-stamp mill. The mill has been running during the management of Mr. Jardine wholly on ore taken from the development without any stoping. The last reports are that the company will add a new 40-stamp mill during the summer. The body of ore mined is said to be 60 ft. wide. The saving in the mill has been better than $7 per ton.

Standard Mining Company.—The new stamp mill of this company at Contact is expected to be in operation by July 1. C. R. Murdock is in charge.

POWELL COUNTY.

(From Our Special Correspondent.)

Emery.—The new shaft on this property, 7 miles from Deer Lodge, in Zozal District, is down 450 ft. A 20-ft. sump is being finished, and a cross-cut from the 450-ft. station is expected to cut the lead by July 15. The machinery equipment has been renewed during the past year at a cost approximating $40,000.

Gold Strike.—A strike of gold ore, which appears to be of considerable importance, was made some 30 days ago by the Daniels Brothers, of Anaconda, at the head of Race Track Creek, near the Deer Lodge County line. Three feet of ore averages, it is claimed, $100 per ton, while 12 ft. of second-class ore along side is said to assay $16 per ton. The whole surrounding country has been located. A new town now contains about 300 prospectors. There are 2 daily stage lines, one from Anaconda and the other from Race Track. A wagon road, built by private subscription, is about completed. Plans are being prepared for a 20-stamp mill on the property.

Power from Race Track Creek.—J. T. Cowan, Geo. Casey and others, of Butte, contemplate an electric power line from the upper waters of this stream to Butte, a distance of 28 miles. It is figured that 1,500 h. p. can be delivered at any stage of water. The power is all contracted for.

Surething.—The last payment on the purchase price of this group, 7 miles from Elliston, has been made. H. E. Steece now is sole owner. The development consists of a tunnel 700 ft. long and a shaft 125 ft. deep, connecting with the tunnel. The ore in the tunnel averages about 5 ft. wide, with a shipping value of $25 to the ton. The shipments average 12 cars per month. Mr. Steece paid $20,000 for the property.

SILVER BOW COUNTY.

Amalgamated Copper Company.—At the recent meeting in New York, the old directors were re-elected as follows: Henry H. Rogers, William Rockefeller, William G. Rockefeller, F. P. Olcott, Anson R. Flower, Robert Bacon, James Stillman and Albert C. Burrage.

NEVADA.

STOREY COUNTY—COMSTOCK LODE.

Crown Point Mining Company.—At the annual meeting last week, 66,134 shares were represented and the old board of directors was re-elected, composed of C. L. McCoy, James Newlands, Sr., James Newlands, Jr., J. P. Martin and A. F. Coffin. C. L. McCoy was elected president; J. P. Martin, vice-president; James Newlands, Jr., secretary, and W. E. Sharon, superintendent.

NEW MEXICO.

GRANT COUNTY.

Dragoon Mining Company.—The following directors have been elected: Geo. M. Jacocks, Leo. C. Dessar, Harold H. Jacocks, I. E. Bermant, and C. A. Spear. The following officers have been elected: Geo. M. Jacocks, president; Leo. C. Dessar, treasurer and secretary. The company's headquarters are in New York City.

Federal Copper Company.—The following directors have been elected: Leo. C. Dessar, Geo. M. Jacocks, Harold H. Jacocks, I. E. Bermant, C. A. Spear, Samuel A. Barron and John Franklin. The following officers have been elected: Leo. C. Dessar, president, and Geo. M. Jacocks, treasurer and secretary. The company's headquarters are in New York City.

NORTH CAROLINA.

(From Our Special Correspondent.)

ROWAN COUNTY.

(From Our Special Correspondent.)

Union Copper Company.—This company has closed its smelter and is shipping concentrates instead of smelting on the ground.

OREGON.

BAKER COUNTY.

White Swan.—Letson Balliet, promoter of this company, has been convicted before the Federal Court at Des Moines, Ia., of using the United States mails for

fraudulent purposes. Balliet was charged with having received about $220,000 from purchasers of stock and with having invested not to exceed $25,000 in the property, and that largely in acquiring title after he had begun to sell the stock. It was shown by the Government that during the 2½ years that Balliet operated the scheme he had expended $25,000 in buying a newspaper at Baker City, and about $35,000 in advertising the mine and himself as the "Cecil Rhodes of Oregon" in many newspapers, that he had expended various sums on actresses and personal outlays, and that since the purchase of the White Swan Mine he had spent practically nothing in developing it on behalf of the stockholders. The Government showed that Balliet intended to defraud the investors by proving his expenditure of about $75,000 of the money in the manner described and when on the stand, Balliet failed to testify as to the whereabouts of the remaining $150,000, known to have been collected by the sale of the stock and not accounted for. It was shown that when Balliet got possession of the mine he removed his headquarters to San Francisco, and employed 30 people sending out circulars and letters advertising his proposition. Balliet is a resident of Des Moines. He was indicted about 16 months ago.

PENNSYLVANIA.

BITUMINOUS COAL.

Beech Creek District.—Coal shipments from January 1 to May 31 were 365,921 short tons, and coke, 75,467 tons.

Broad Top Region.—Shipments in the 5 months ending May 31 were 392,690 short tons.

SOUTH DAKOTA.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Crown Hill Company.—This company is in the hands of a receiver. Bids are being asked for a sale of the Crown Hill claims, at Crown Hill Station, the money received to go to the creditors. The company owns the Spokane Mine south of Keystone. S. E. Young, of Brookings, S. D., promoted the company.

Golden Crest Company.—The following officers have been elected: President, Robert L. Bailie, Detroit; vice-president and secretary, Edwin Henderson, Detroit; treasurer, John M. Monroe, Detroit; general manager, Frank Webber, Deadwood. The company owns a mine in the Strawberry Gulch District.

Hawkeye.—It is reported that this mine, between Lead and Pluma, has been sold to Chicago men. The mine has a 40-stamp mill at Pluma.

Hidden Fortune Company.—The first shipments of ore will start this week to the National Smelter at Rapid City. There is a large amount of ore blocked out.

Homestake Company.—A new settling plant has been installed by the Homestake Company at Lead, consisting of 6 tanks 10 ft. in diameter and 16 ft. deep. The water from the slime tables is caught and used again.

TEXAS.

JEFFERSON COUNTY.

According to a dispatch from London, Eng., the Texas Oil Fields, the Oil and Fuel companies and the Hogg-Swayne concerns were amalgamated recently under the name of the Consolidated Texas Oil Company. The capital of the new company is £1,200,000. There will be a public issue of stock in July. The Hogg-Swayne Company, it is understood, will retain a large interest in the amalgamated company. Lord Rothschild is interested in the combination.

(From Our Special Correspondent.)

Lone Acre Oil Company.—This company in seeking to modify an injunction restraining it from erecting storage or settling tanks on Spindletop has filed a motion in which it asserts that the conditions of the oil-field have materially changed since it was enjoined and that the great majority of the former gushers need to be pumped. The allegations create some excitement and the testimony introduced pro and con will be interesting. Gas and air pressure are in great demand and their use is necessary to flow most of the wells.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Settlements.—For the week ending June 7 the banks report the following settlements on bullion, etc. Bullion, $61,200; gold, silver and lead ores, $274,400; gold bullion, $15,500; auro-cyanides, $2,700.

BEAVER COUNTY.

(From Our Special Correspondent.)

Frisco Shipments.—In the week ending June 7 the Horn Silver shipped 3 cars of ore to the smelter.

Crown Point.—A rich strike is reported in an extension of the Willowvale vein showing 2 ft. of ore, carrying free gold.

Johnny.—The new working shaft is to be some 300 ft. east of the one now in use, and will be sunk 300 ft. The management will break ground about June 20, and by the terms of the contract stamps are to be dropping 90 days later.

Old Hickory.—It is stated that President A. B. Lewis has acquired the Apex group at Milford, owned by John Forgy. The management expects to erect buildings and proceed with development. President Lewis will resume work at once on the O. K.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—For the week ending June 7 these were: South Swansea, 28 cars ore; Carisa, 9 cars ore; Mammoth, 10 cars ore; May Day, 1 car concentrates, 1 car ore; Bullion Beck, 5 cars ore; Gemini, 8 cars ore; Ajax, 2 cars ore; Eagle & Bluebell, 1 car ore; Yankee Consolidated, 7 cars ore; Dragon Iron Mine, 16 cars; total, 89 cars.

Bullion Beck.—It is stated that 25 miners have been taken on, making about 60 on the pay-roll.

Lower Mammoth.—According to the latest reports a new ore body has been uncovered in a winze below the 1,000-ft. level, which runs several hundred ounces of silver and $5 to $10 in gold per ton. The extent of the new body has not been determined.

Orient.—A strike, opened in this West Tintic property, is reported to show an average of $10 per ton.

Petro.—It is stated that 4 ft. of ore are exposed, and that shipments to smelter will begin this month. Values lie largely in lead and silver.

Victor.—As near as can be ascertained, A. W. McCune has purchased approximately 150,000 shares of this stock, making his entire interest about four-fifths of the whole capitalization. How much was paid per share cannot be found, but the market value is about $20,000.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—For the week ending June 7 the following shipments were made to the smelters: Sampson, 1 car ore; York, 1 car; Yampa, 1 car.

Bingham Consolidated.—The fourth furnace is reported in commission. The present battery of furnaces will probably be able to care for 500 tons daily.

Niagara.—An assessment of 30c. per share has been met by a surprisingly large list of delinquents. Out of 325,000 shares issued, it is stated that 321,000 have failed to respond. The Niagara owes about $55,000 in addition to its bonded indebtedness.

Utah Consolidated.—The usual weekly shipment of 4 cars of bullion has gone east. The 4 cars approximate 240,000 lbs.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Park City Shipments.—The MacIntosh sampler reports receipts during the week ending June 7 as follows: Daly-West, 2,447,160 lbs. ore; Ontario, 1,270,100 lbs. ore; Anchor, 431,700 lbs. ore.

Daly-Judge.—The management has decided to handle profitably the large amount of milling ore in the Anchor ground, to double the capacity of its concentrator, increasing the number of tables by eight. This will give a capacity of 250 tons daily. It is intended also to ask the railway to extend its track to the mouth of the tunnel, necessitating about a mile of construction.

Daly-West.—On June 16 this company will distribute $72,000, or 40c. per share as a regular dividend.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—For the week ending June 7 the Ophir Hill sent to smelters 30 cars lead-silver concentrates; the Hidden Treasure, 3 cars.

Chloride Point.—The properties on Lion Hill have been sold under the direction of G. A. Duncan, receiver, for $11,663, and have passed into the hands of the Salt Lake Hardware Company.

Hidden Treasure.—Ore carrying 5 per cent copper is reported in the workings, while lead and silver orebodies are said to be widening to 7 and 12 ft. between walls.

Mono.—This old producer is being prospected by the present management. A new tunnel is to be driven along the dike.

Sacramento.—According to Superintendent Cochler, the new mill will go into commission by June 15.

Vulcan.—This group at Stockton, recently purchased by Charles Scheu and M. H. Walker, of Salt Lake, has, with other claims controlled by the owners, been capitalized at $300,000 in $1 shares. A shaft is being sunk to the 300-ft. level, from which prospecting will begin. Judge W. H. Dixon has joined Walker & Scheu in this enterprise.

WASHINGTON.

FERRY COUNTY—REPUBLIC.

(From Our Special Correspondent.)

Apache.—Four men are taking out and sacking ore that shows high values in gold, silver, copper and lead. A new 2-compartment shaft is being sunk.

Hilo.—A car-load of ore is being shipped from this claim in Moses District to the smelters on trial.

Silver Dollar.—The shaft is down 65 ft, with no change in the formation.

Stray Horse.—This claim is advertised for sale under execution by the sheriff to satisfy judgment and expenses, amounting to about $2,000.

Tom Thumb.—Water is coming in so fast on the 400-ft. level that the tanks cannot handle it. The station pump will be removed from the 265 to the 400-ft. level.

Washington & Great Northern Railway.—South of Nelson, on the international boundary line, the roadbed has been completed and the rails laid to Curlew. Between Curlew and Republic the grading is finished. The bridges will be finished and the rails laid to Republic by June 15, when the spurs to the principal Republic mines will be completed.

OKANOGAN COUNTY.

(From Our Special Correspondent.)

Grant.—This extension of the Buckhorn Mine has been bonded to Thomas Clark, it is presumed for Patick Clark, of Spokane, Wash., for $33,000. Eight men are at work. The property is 2 miles east of Bolster, between Chesaw and the Kettle River.

Hidden Valley.—The tunnel is in 320 ft. Five men are driving it.

FOREIGN MINING NEWS.

AUSTRALIA.

NEW SOUTH WALES.

Broken Hill Proprietary Company.—The report for the 4 weeks ending May 21 shows an output from the refinery of 509,451 oz. silver, 4,144 tons lead and 29 tons hard or antimonial lead.

QUEENSLAND.

The Mines Department reports for April that the total yield of gold for the month was 67,193 oz. bullion, equal to 47,692 oz. fine gold. This compares with 41,560 oz. fine gold in April, 1901, showing an increase of 6,132 oz., or 14.8 per cent. For the four months ending April 30 the total output was 175,104 ounces fine gold, or $3,619,400.

CANADA.

BRITISH COLUMBIA—CASSIAR DISTRICT.

(From Our Special Correspondent.)

Atlin Lake Company.—This company has 10 men busy on its property on Birch Creek, near Atlin. Hydraulicking started a month earlier than last year.

Atlin Willow Creek Company.—This company has had a large number of men getting its property in shape for the season's work.

Columbia Hydraulic Company.—This company has started hydraulic work for the season. A. A. Johnson, of Atlin, is the new manager.

Pine Creek Power Company.—This company at Atlin has received power from the Government to carry into effect the privileges contained in the charter granted last fall. This will enable the Sunrise and other companies to start hydraulic work. The Sunrise is repairing its big flume.

Societe Minicre.—This company has begun hydraulic work for the season on Boulder Creek, near Atlin.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

Rossland Ore Output.—The shipments for the week ending May 31 show somewhat of an advance over the previous week, but the aggregate is still considerably below normal, due to the continued curtailment at the Le Roi, says the Rossland *Miner*. Some machine crews were added to the force at the Le Roi during the week. The output for the week ending May 31 and for the year to date is as follows:

	Tons.	Tons.
Le Roi	2,977	101,812
Le Roi No. 2	1,750	26,505
War Eagle	...	210
Centre Star	...	3,410
Rossland G. W.	...	2,400
Giant	...	160
Cascade	...	300
Bonanza	...	90
Velvet	...	250
Spitzee	...	20
Total	4,727	139,522

NOVA SCOTIA—CAPE BRETON.

Dominion Coal Company.—This company reports for May shipments of 269,161 tons of coal. For the three months of the fiscal year from March 1 to May 31 the shipments were 618,515 tons, against 487,035 tons in the corresponding period in 1901; showing an increase of 131,480 tons, or 27 per cent, this year.

MINING STOCKS.

(Complete quotations are given on pages 850 and 851 of stocks dealt in at):

New York.	Mexico.	San Francisco.
Boston.	London.	Salt Lake City.
Philadelphia.	Paris.	Spokane.
Colo. Springs.	Toronto.	St. Louis.

New York. June 12.

On 'change comparatively little interest is shown in copper stocks, but on curb manipulation they have attracted some attention. Amalgamated recovered fractionally, selling up to $69½ from $68¼, though sales were small. Anaconda weakened from 116½ per cent ($29⅛), the high point last week, to 113 per cent ($28¼) this week, transactions being in small lots. On curb Tennessee was the feature, fluctuating between $12 and $16⅞ on large sales, initiated by free offerings as the price advanced. Some trading on narrow limits was done in United of Montana "when issued" at $34⅝@$35⅛. Sales of White Knob of Idaho established a price of $22, but later the market weakened. The Mexican stock, Greene Consolidated, hovers around $28, while insiders are supporting the market. Union of North Carolina is stronger, selling at $4¾. A large business has also been reported in Montreal & Boston of British Columbia at $2⅜@$2.

The gold and silver stocks were very quiet, and prices fluctuated about as last week, though the Comstocks were weaker.

Listings on the New York Stock Exchange were $37,000 additional general mortgage 5 per cent sinking fund coupon bonds of 1943 of the Colorado Fuel and Iron Company, making the total to date $5,311,000, and also from time to time as issued prior to December 1, $689,000, making a total of $6,000,000.

Auction sales were 100 shares Peacock Copper Company, par $5 at $5 for lot; 100 shares Colorado Coal, Iron and Development Company at 87½c. per share; $45,000 first consolidated 6 per cent gold bonds Richmond Coal Mining and Manufacturing Company at $1,000 for the lot.

Boston. June 11.

(From Our Special Correspondent.)

The mining share market gives little evidence of life and continues as dull as it well nigh could. Brokers report very few stocks offering, while pools and inside interests are carrying the stocks. Fluctuations, necessarily, during the week have been very narrow and hardly call for comment.

President Day, of the Centennial, is now in the Lake Superior country and he is expected to make arrangements for milling Centennial ore.

Heinze's United Copper is expected to be listed on the Boston Stock Exchange about July 1. Little has been done on the curb of late. Boston Consolidated suffered a release to $3.75 on the curb, due to the death of George E. Armstrong, who was its treasurer and chief sponsor.

Calumet & Hecla holds at $570; while trading has been done in Tamarack at $180 and Osceola at $61.50. Utah holds at $22. United States Oil has varied from $16 to $17.

Bingham Consolidated holds steady at about $35. The fourth stack has been blown in at the smelter. Reports are current of rich ore strikes at the Dalton & Lark properties of the Bingham.

Dominion Iron and Steel slid off from $55 to $53.12½, but stiffened to $56.14. Dominion Coal holds about $140.

Tuesday, June 17, will be celebrated as "Bunker Hill" day as usual, consequently the Exchange will adjourn over.

Colorado Springs. June 6.

(From Our Special Correspondent.)

The market remained practically stationary during the past week, some variation, however, being afforded by the advance in Mollie Gibson and El Paso. The former share jumped from 14c. on May 29 to 22c. June 5, although the largest sale was made 2c. below this quotation. The cause of the rise is the rumored recovery of the rich shoot at a depth of 900 ft. and 200 ft. west of the old vein. It is still too early to bank much upon the strike.

El Paso advanced from 51⅛c. May 29 to 54c. today, being in good demand. Reports from the property continue favorable. Elkton fluctuated between 62½c. and 65c. during the week with fair trading. The mine is making a good record for itself and the company is again earning its dividend although none will be paid until the cash reserve in the treasury has been considerably increased. There are several heavy payments on machinery to be made.

Doctor-Jack Pot has again proved a disappointment by dropping from 20c. May 29 to 13⅞c. today, closing at 14c. Golden Cycle advanced to 65½c. June 4, but closed at 62c., there being no demand. This company promises to pay its first dividend in July.

Salt Lake City. June 7.

(From Our Special Correspondent.)

The market for the week has been in decline from the opening to the close. Some stocks during the middle of the week grew stronger, showing a tendency toward higher prices. Many surmised, on the ground of the subsequent fall towards the close of the week, that the spurt was produced by manipulation. The trading this week has been heavier than the week previous, and almost double the amount of business has been done, but it was strictly a buyers' market.

The governing board of the Mining Exchange has appointed a committee, which is at work on a revision of the rules of the exchange; some radical changes will probably be made. It is also stated that a bond will be required from each member as a guarantee that all deals and contracts shall be executed.

San Francisco. June 7.

(From Our Special Correspondent.)

The market showed a fair amount of trading this week, with prices generally easier. The middle Comstocks declined further under free selling by inside traders. At the close the feeling was somewhat firmer.

Some quotations noted are: Consolidated California & Virginia, $1.40; Ophir, $1.25@$1.30; Mexican, 52c.; Hale & Norcross, 37c.; Potosi, 27@28c.; Yellow Jacket, 20c.

The monthly record of sales on the Oil Exchange since January 1, 1902, is as follows:

	Shares.	Value.
January	187,854	$81,633
February	288,562	76,447
March	214,293	109,364
April	442,231	239,938
May	213,483	185,594
Totals	1,346,423	$692,976

The month of May showed a considerable falling off from April, but the transactions showed much less decrease in amount than in number of shares, indicating a larger proportion of business in the higher priced stocks.

Business on the Oil Exchange showed some improvement, and there was a fair demand for stocks. Home and Sterling continued features, while Sovereign was also in demand, with Bear Flag among the low-priced stocks. Some quotations noted are: Home, $3.20; Sterling, $1.60@$1.65; Sovereign, 30@32c.; Junction, 22c.; Petroleum Center, 10c., and Bear Flag, 6c.

London. June 3.

(From Our Special Correspondent.)

The declaration of peace in South Africa has been received with a sense of relief in the City. There has, of course, been a great deal of activity in the South African mining market, and efforts have been made to create a boom. There are, however, as I have often before mentioned, so many holders ready to part with their shares at a slight profit that no considerable advance can be made in quotations just yet. These holders mostly acquired their shares two years or more ago, when we all expected the war to be over in a few months, and the idea in the speculation was to make a big profit in a short time. After holding so long they are glad to get out and see their money again. Though peace is declared, it is necessary to remember that some time must elapse before military rule is over, so that the free exploitation of mineral lands will not come just yet. The Stock Exchange is, therefore, inclined to take a sober view of things, and its enthusiasm is confined to singing "God Save the King." I have several times referred to the fact that the City did not believe in a patched up peace, but hoped for the capture of all the Boers in the field and the reorganization of South Africa on imperial lines without any necessity of parleying with the enemy. It is now considered, however, that the terms of surrender are highly satisfactory, and should ensure a lasting peace.

The financial houses are, therefore, preparing for a boom, and are making a little stir in the market for favorite shares. I hear also of a great number of new propositions that will be brought forward in the way of exploring and land companies to exploit mineral lands in various parts of the Transvaal and Rhodesia. Very few of these propositions, however, get into the hands of people who have their headquarters in London, for all the best things are being picked up in Johannesburg. It is necessary, therefore, to caution the public with regard to the coming flotations, that properties floated by purely London houses have most of them been looked into and rejected by the South African firms.

A new land company has been introduced to the public this week called the Salisbury Building and Estates Company, Limited, with a capital of £150,000, to acquire a number of building sites in Salisbury, Rhodesia. The company is floated by a firm that has had a good deal of experience in handling South African lands of all kinds. The success of this particular company will depend on the growth of Salisbury as a business town, which in its turn depends on the prosperity of Rhodesia as a mining country.

The West Australian market continues to be under a cloud, caused by the bear raid. The reports circulated are uniformly pessimistic as regards ore reserves and developments with depth. The quotations of the leading mines have been depressed. As an example, I may mention that Great Fingalls are now at £7, as compared with £15 2 or 3 months ago. Great Boulder Perseverance shares are now no higher than £11, though some weeks ago they were over £15, and were being talked up to £30. Altogether West Australians are now less liked than ever they have been.

The Le Roi Mine continues to worry the shareholders. A week or two ago I mentioned that Mr. McKenzie had reported that it was impossible to ship paying ore and that the estimates of monthly profits had been proved quite unreliable, a loss having actually occurred. On this news the £5 shares dropped to a little over £1. Since then Mr. McKenzie has reported that an actual profit of $18,000 was made in April, and that an estimated profit of $55,000 will be made on the shipments during May. Also that a shoot of ore 8 ft. wide of a value of $15 has been struck at the 900-ft. level. Consequently, the shares have fluctuated somewhat, but very little buying took place. As a matter of fact, I believe that the high figures for May are due to the fact that Mr. McKenzie is pursuing his policy of picking out the best ore, as he considers it hopeless to attempt to ship the ore in bulk. This policy commends itself to many people here, as it is the most likely one to bring a dividend to the shareholders.

The report of the Salt Union, Limited, for 1901 shows a slight increase in business and profits. The deliveries of salt were 903,000 tons, as against 853,000 in 1900. The chief cause of the increase in shipments was the lower rates of freight for export. The amount of salt used for chemical purposes is decreasing, owing no doubt to the fact that many chemical works have now salt lands of their own. The net profits available for dividend were £95,000, as compared with £70,000 in 1900. The 7 per cent preference shares get only 3 per cent dividend and, of course, the ordinary shares get nothing. In 1900 the preference shares received only 1 per cent. In contrast to these results the report of Brunner, Mond & Company is very brilliant. The profit for 1901 was £480,000, and the ordinary shareholders receive 32½ per cent dividend. It is no wonder that these shares stand among the favorite industrial investments in the country.

ASSESSMENTS.

Name of Company.	Location. No.	Delinq.	Sale.	Amt.
Alta	Nev. ..	May 26	June 20	.05
Andes	Nev. 56	June 18	July 18	.05
April Fool	Nev. ..	June 7	June 28	.05
Belcher	Nev. ..	June 14	.....	.50
Best & Belcher	Nev. ..	June 28	July 23	.15
Challenge	Nev 34	July 8	.....	.05
Champion	Cal. 33	June 14	July 3	.50
Eutonia	Utah. 11	June 7	June 30	.00½
Hale & Norcross	Nev. ..	May 27	June 20	.10
Jenny Lind	Cal. ..	June 25	.....	.01½
Justice	Nev. ..	June 16	July 9	.05
Little Chief	Utah. 12	June 19	July 7	.01
Madeleine	Utah. 1	June 9	June 30	.00¼
Mayflower	Utah. ..	June 5	June 21	.00½
Reward	Cal. ..	June 30	.....	.02
Sierra Nevada	Nev. ..	July 1	.....	.10
Silver Bow	Utah. 4	May 30	June 17	.00½
Silver King	Ariz. 24	May 27	June 24	1.00
Spence	Cal. ..	June 26	.....	.03
Tetro	Utah. 23	June 30	July 26	.01
Utah Con.	Nev. ..	June 16	July 11	.05
Victor	Utah. 5	June 9	June 30	.03
Yellow Jacket	Nev. 11	May 10	June 19	.10

DIVIDENDS.

Name of Company.	Latest Dividend Date.	Per Share.	Total.	Total to Date.
†Crucible Steel, pf.	June 28	$1.75	$437,500	$3,062,500
*Empire State, Ida.	June 16	.05	25,277	1,410,000
*Esperanza, Mex.	June 10	4.10	12,450	997,620
*Homestake, S. D.	June 25	.25	52,500	11,283,750
Homestake, extra	June 25	.25	52,500	.....
*Imperial Oil, Cal.	June 6	.20	20,000	120,000
§Maryland Coal pf.	July 1	2.50	47,125	791,669
†National Lead pf.	June 16	1.75	260,820	12,405,200
*Natividad, Mex.	June 19	1.66	3,984	135,324
†Ontario, Utah	June 20	.30	45,000	14,827,000
Peerless Oil, Cal.	June 2	.05	5,000	10,000
†Republic I. & S., pf.	July 1	1.75	355,371	4,264,451
†Sloss-Sheffield St. & I. pf.	July 1	1.75	117,250	1,159,500
†Standard Oil.	June 16	10.00	9,700,000	49,485,000
*Sta. Maria de Guad., Mex.	June 10	4.15	10,375	346,500
*Thirty-three Oil, Cal.	June 6	.10	10,000	60,000
Thomas Iron, Pa.	Aug. 1	4.00	100,000	200,000
†U. S. Red. & Ref., com.	July 1	1.00	58,850	117,700
†U. S. Red. & Ref., pf.	July 1	1.50	58,850	294,249
West Shore Oil, Cal.	June 5	.05	5,000	30,000

*Monthly. †Quarterly. §Semi-annual.

COAL TRADE REVIEW.

New York. June 6.

ANTHRACITE.

The mines are still idle, with no sign of immediate activity. How long they will remain idle is still an open question, but indications multiply that the strike will not last as long as some people have feared. There can be no question but that a majority of the mine employes were against a strike, particularly those of foreign birth. The strike has now lasted nearly 5 weeks, and yet the Union has not made any regular payments of strike benefits. Many of the men who struck were told that the Union would care for them. When they find how little such promises amount to they may wonder why they remain idle. It will take time for them to get to this point, but when they do, they will be kept from work only by fear. It is quite likely that by July 1 the sentiment in favor of returning to work will be gaining strength, and it is very likely that the strike will be broken by August 1. In any case, however, it is hardly likely that the Civic Federation will settle the strike. Certain members of that body, having said enough to show their ignorance of the questions involved in the strike, and which side they would favor, apparently have realized the danger of indiscriminate talk and are now still. This is a gain. The visit of Col. Carroll D. Wright to New York City has resulted in his collecting a large amount of data bearing on the strike, and his report should be of value. If it tells what caused the Hazleton convention of mine workers on May 8 to vote for a strike it will give information that has not been made public.

Trade at all points is restricted as supplies decrease, and prices stay up. At the head of the Lakes there is but a little coal on the docks, with prospects of its being cleaned up in a short time. In Chicago territory business is quiet, but the supply of coal is much better apparently than elsewhere; in fact, there is said to be enough on hand to last dealers 2 months. At lower lake points supplies are generally light. In the East the territory beyond Cape Cod is probably as well supplied with anthracite as any. At New York the consumption of bituminous coal by hotels, restaurants and office buildings is increasing, and the large companies are restricting sales still more, letting coal go only to their best customers. At Philadelphia domestic trade is quiet, but stocks of the steam sizes are fast decreasing. At New York the prepared sizes have sold at retail as high as $10 per ton. Sales of cargo lots of pea coal have been made at $5.25@$5.50.

BITUMINOUS.

In the Atlantic seaboard bituminous trade the demand for coal is very heavy, every consumer apparently wants twice as much as he actually needs; producers, however, are keeping their eyes on the monthly proportion of shipments called for in contracts and are shipping coal up to that limit, but no more. In certain districts labor troubles at the mines have restricted shipments. A larger proportion of the miners in Virginia and West Virginia quit work than was anticipated, yet very few mines are completely closed. It is estimated that about one-fifth the normal output is being shipped from the affected districts. The impression prevails that the strike will prove abortive and that operators will succeed in gradually increasing their working forces. Speculative prices for coal at New York Harbor points have gradually increased, and now as high as $4.50@$4.60 is paid, f. o. b. New York Harbor shipping ports. There is apparently plenty of coal to be had at the top prices, however, and only those people in need of coal at the moment are paying the figures named.

Trade in the far East has been calling for and receiving large amounts of coal. Producers are known to have large orders in hand, but are holding the coal back until the consumer's contract calls for the shipment. Stocks beyond Cape Cod are thought to be of fair size, and no speculative prices are heard of in that territory. Along Long Island Sound trade is heavy, and the demand exceeds the supply, as was the case before the present stringency. Consumers in the all-rail trade want coal. Most of them, it is believed, have small stocks on hand and with what they are getting can keep going.

Transportation from the mines to tidewater is about up to schedule, but irregular, coal coming through in bunches. As a result shippers at tidewater have to keep a little coal in hand to tide over the days when arrivals are light. Car supply at the mines is fairly good, and most producers are getting almost all the cars they ask for. In the coastwise vessel market vessels are in good supply, freights are weak and shippers offering prompt loading can get 5c. discount from the current quotations, which are as follows from Philadelphia: Providence, New Bedford and Long Island Sound, 70@75c.; Boston, Salem and Portland, 85@90c.; Lynn, Wareham, Newburyport, Bath, Bangor and Gardiner, 95c.@$1; Portsmouth, 90@95c.; Saco, $1 and towages. Rates from Chesapeake Bay ports are 10c. above these figures.

Birmingham. June 9.

(From Our Special Correspondent.)

What will be done by the miners at their convention this month is the all-absorbing question in Alabama. It is known that the miners will ask for eight hours to constitute a day; two pay-days a month and other things. It is likely that a larger maximum rate will be asked for with the minimum advanced. The operators say they cannot afford to pay any advances whatever. They are willing to renew the present contract. They do not care to grant the two-weeks pay-day demanded and cannot afford 8 hours a day.

There is a sufficiency of cars in which to handle the product of the coal mines. The Alabama Car Service Association is now seeking the right before the State Railroad Commission to limit the time for unloading of coal cars to 48 hours instead of 72, as is now the rule.

Chicago. June 10.

(From Our Special Correspondent.)

Wholesale trade in anthracite coal is at a standstill, except for filling orders given before the beginning of the strike. Dealers are speculating on how long the present stock in Chicago will last. The total amount of anthracite in the yards of the wholesale dealers is not more than 100,000 tons, against a normal supply of 200,000 to 300,000 tons for this season. Probably the present stock is good for three to four months if the buyers of anthracite do not become over-anxious.

The trade in bituminous coals is very brisk as a result of the situation as regards hard coal. Smokeless grades are in demand and dealers and consumers of all grades are laying in heavy stocks. Prices have advanced 10c. per ton on smokeless lump, egg and nut. Quotations to-day are as follows: Smokeless lump and egg, $3.50; smokeless nut, $3.25; smokeless mine-run, $3; Hocking, $3; West Virginia, $3.12; Youghiogheny, $3.20; Indiana block, $2.45; Indiana semi-block, $2.10; Clinton lump, $1.90; Indiana lump, $1.80; Northern Illinois run-of-mine, $1.80; Southern Illinois run-of-mine, $2; blacksmiths' coal, $3.35.

Cleveland. June 11.

(From Our Special Correspondent.)

The Cleveland market has been enlivened by two incidents during the past week of more than passing importance. The first was the announcement a few days ago that two contracts for carrying coal have been made aggregating 500,000 tons. The larger portion of it goes to Milwaukee at 45c. and the remainder goes to the head of lokes, the rate of transportation on which is 35c. The angle is a peculiar one. The owners had been asking 50c. to Lake Michigan and the shippers offering 35c. The owners had asked 35c. to the head of the lakes and the shippers had offered 30, the prevailing wild rate. Some of the owners withheld their tonnage from the head of the lakes, refusing to take the lower rate. The shippers began to get uneasy about the movement of their coal. To allow the owners to withdraw gracefully, the shippers paid what was asked on Duluth, but offset this by insisting that the owners yield to the Milwaukee rate. The compromise was effected and the shippers made their point, which was to assure the movement of a certain portion of their coal. This will open the way for other contracts.

The coal supply has been anything but satisfactory and the trade has lagged. Yesterday the railroads served notice upon the shippers to charter no more boats for this week's loading. Some of the roads have been stampeded by the prospect of an extension of the strike into the soft coal fields and have started to confiscate coal for their own use, which may explain in part their instructions to the shippers.

Pittsburg. June 11.

(From Our Special Correspondent.)

Coal.—There is but little change in the coal situation this week. The demand is as great, and prices remain the same, except where prompt shipment is desired. All of the mines of the Pittsburg Coal Company are in full operation, there being a good supply of railroad cars. The mines of the Monongahela River Consolidated Company are only in partial operation, owing to a lack of empty coal boats and barges. This company now has loaded and ready for shipment over 25,000,000 bush. of coal. The rivers are not navigable, and it is impossible to get empties. The mines that are running supply local trade. There is an apparently reliable rumor that a new independent coal company will soon enter the river coal trade.

Connellsville Coke.—The strike of the blast furnace workers did not have any effect on the coke production. Prices for Western shipment remain at $2.25 for furnace and $2.50@$2.75 for foundry, but a much higher price is asked for all coke being sent to the Eastern markets. According to the last issue of the *Courier* the production for the previous week was 249,995 tons. The shipments for the week aggregated 12,404 cars distributed as follows: To Pittsburg and river tipples, 3,960 cars; to points west of Pittsburg, 5,811 cars; to points east of Connellsville, 2,633 cars. This was an increase of 350 cars compared with the shipments of the previous week.

San Francisco. June 7.

(Special Report of J. W. Harrison.)

Coast arrivals during the past week were as follows: Three from British Columbia, 8,032 tons; two from Oregon, 930 tons; three from Washington, 10,922 tons; one from Australia (Newcastle), 2,195 tons; total, 22,079 tons. It is singular that the apparent light demand for steam coals and the average quantity arriving this and several weeks past there is no marked accumulation in yards. About all the deliveries of coal for steam purposes are now being made off shore, which narrows down its demand almost entirely to bay and ocean steamers. The transports are calling for their usual quantities, which aggregate a very large portion of all that is imported. Prices are still low for both coal and oil, so that manufacturers cannot complain at the cost of their motive power. Coal freights from Australia and Great Britain do not show any improvement, yet the list of vessels loading for this port does not diminish. Fuel oil will, in a short time, be shipped to the Hawaiian Islands, which will increase the direct shipment of coal from Australia to San Francisco. A reduction of $1 per ton on Wellington coal has been made this week. This is a voluntary concession on the part of the agent here, and as oil cuts no figure for domestic uses, the reduction becomes the more praiseworthy.

Foreign Coal Trade. June 12.

The export market here is very quiet. The anthracite strike and the higher prices of bituminous at seaboard ports have affected the trade for the present, and no new contracts are reported. The troubles in West Virginia have also added to the uncertainty. These influences are only temporary, however, and will not last very long.

Imports of fuel into Germany for the 4 months ending April 30 are reported as below, in metric tons:

	1901.	1902.	Changes.
Coal	1,604,880	1,664,971	I. 60,091
Brown coal (lignite)	2,518,555	2,358,564	D. 159,991
Coke	145,801	123,357	D. 22,444
Totals	4,269,236	4,146,892	D. 122,344

Of the coal imports this year, 2,477 tons were from the United States, against 43 tons last year.

Exports of fuel from Germany for the 4 months ending April 30 were as follows, in metric tons:

	1901.	1902.	Changes.
Coal	4,713,769	4,729,263	I. 15,494
Brown coal (lignite)	6,265	5,465	D. 800
Coke	734,366	596,452	D. 137,914
Totals	5,454,400	5,331,180	D. 123,220

The heaviest exports were to Austria, Holland, Belgium and Switzerland.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of May 31 that the general tone of the Welsh coal market remains unchanged. Prices are steady for all descriptions, and stems for the best sorts are well filled. Quotations are: Best Welsh steam coal, $3.96@$4.02; seconds, $3.84; thirds, $3.54; dry coals, $3.24; best Monmouthshire, $3.42@$3.48; best small steam coal, $2.22; seconds, $1.98; other sorts, $1.80.

The above prices for Cardiff coals are all f. o. b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f. o. b. Newport, exclusive of wharfage, but inclusive of export duty, and are for cash in 30 days, less 2½ per cent discount.

There is no change to report in the outward freight market. A quiet business is passing at rates which show little quotable change. Some rates quoted from Cardiff are: Marseilles, $1.45; Genoa, $1.44; Naples, $1.44; Sabang, $2.76; Singapore, $2.76; Las Palmas, $1.50; St. Vincent, $1.74; Rio Janeiro, $3.12; Santos, $3.48; Buenos Ayres, $3.24.

IRON TRADE REVIEW.

New York. June 12.

The conditions of the market are unchanged. There is still a pressure for early deliveries, especially in structural steel, and premiums continue to be paid. The plate makers have resolved to maintain prices nominally, but the smaller mills are taking orders at an advance. The strike of the blast furnace workers in the Mahoning and Shenango Valleys has been settled.

The general conditions are well shown in our local letters which follow.

Blast furnace reports for June show a decrease of about 7,000 tons in the weekly capacity of the active furnaces. Stocks unsold are very low, only 63,000 tons being reported on June 1.

Birmingham. June 9.

(From Our Special Correspondent.)

There is very little iron for immediate delivery in this market and price is not a consideration. The

smaller purchasers are scrambling for the product, and though they are regular customers, they have to accept the situation. The production is about the same. The new, big furnace of the Republic Iron and Steel Company starts up this week. The production will be between 200 and 300 tons a day. The Sloss-Sheffield Steel and Iron Company is pushing the work on its blowing engines at the City furnaces and expects to be able to blow in the second furnace before many weeks.

The shipments from this market show very little change. The $16 basis for No. 2 foundry is still being quoted but the talk is that this price will be advanced $1.50 per ton. The question of raw material is giving no trouble in this district. A visit to some of the furnaces showed the stockhouses pretty well filled. There is not an over-abundance of coke, however, and that product is bringing a big price. The companies in this district making their own coke for production are offering none to the open market.

So far no iron has been sold for delivery during the year 1903, though there are inquiries for that period. The furnacemen are willing to wait a while yet before beginning on orders for next year. An inspection of the sales-books of the Tennessee Coal, Iron and Railroad Company and the Sloss-Sheffield Steel and Iron Company during the past week by the committee of the coal miners in the employ of these companies for the purpose of ascertaining the average selling price so as to make up the wage scale for the month for the miners, was a formal affair. A statement was made that the average price of iron was above $11, which entitled the miners to the maximum wage smaller purchasers are scrambling for the product, and though they are regular customers, they have to accept the situation. The production is about the same. The new, big furnace of the Republic Iron and Steel Company starts up this week. The production scale, or 55c. per ton, and they were no further concerned.

The following quotations are given: No. 1 foundry, $16.50; No. 2 foundry, $16; No. 3 foundry, $15.50; No. 4 foundry $14.50@$15; gray forge $13@$15; No. 1 soft $16.50; No. 2 soft, $16.

In finished iron and steel circles there is still much doing in this district. The rolling mills have orders on hand which will warrant them in running through the entire summer if the hands can be kept at work. Foundries and machine shops have plenty of work in hand and in sight. Scrap iron is still in demand and bringing good prices. Cast iron pipe makers report a steady trade with heavy shipments. The shipment of a car-load of valves by the Dimmick Pipe Company, North Birmingham, was something new for the district. A good report of conditions is made by the Alabama Tube and Iron Company, whose plant at Helena is in steady operation.

Buffalo. June 11.

(Special Report of Rogers, Brown & Co.)

During the past week there has been a noticeable increase in the number of inquiries for iron to be delivered during the first six months of next year, and a number of orders have been placed for shipment after January. Several furnaces are not anxious to make quotations, and prefer not to do so at this time for next year's delivery. For later delivery we quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, $22.25@$22.75; No. 2, $21.75@$22.25; Southern soft, No. 1, $22@$23; No. 2, $21.50@$22.50; Lake Superior charcoal iron, $22@$23.

Chicago. June 10.

(From Our Special Correspondent.)

There is a general tightening of lines about sales of pig iron, due to several causes. The uneasiness of furnacemen about long-time future deliveries, the growing discontent of labor, the prospect of scanty coke supply for an indefinite time—these things are causing apprehension and the growth of conservatism. Sales are scarce and mostly confined to small lots; a few good-sized contracts are being made for delivery mostly in 1903. Southern iron grows stiffer in price; sales of No. 2 are reported to-day at $21.65. The range of No. 2 in the last week has been $20.50@$21.50. Northern remains at $21.50@$22 for No. 1; $21@$21.50 for No. 2; $20.50@$21 for No. 3.

Coke is scarce and promises to be scarcer; the price has advanced 25c. in the week, being now $5.75. Connellsville is out of the market entirely; only West Virginia coke is coming in.

Cleveland. June 11.

(From Our Special Correspondent.)

Iron Ore.—With the boats moving so much more freely than they have at any time during this year the shippers have not developed any tendency to break the rate of carriage on iron ore. The market seems ripe for it, but it does not come. The unloading ports for the first time this year are about freed of any blockade, the cause for which is an additional supply of cars added to by a blockade in the Sault Ste. Marie River that has delayed boats from 10 to 36 hours in locking through. The rates remain at 75c. from the head of the lakes, other rates being proportionate.

Pig Iron.—Wild sales are limited, but such as are made are on the old prices of $21 for No. 2 foundry, Valley furnace; $21.75 for bessemer and basic in the Valley, and $17@$18 Birmingham on No. 2 Southern foundry. Southern furnaces will have a good deal of material yet to sell for third and fourth quarter delivery.

Finished Material.—The larger mills are accusing the smaller ones of withholding material from those who have contracts, and re-selling it to outside buyers at a premium. This is said to have occurred in bars and plates, particularly, and in some instances in structural steel. In plates the situation has been complicated by the breaking up of the plate pool for the time being to permit the smaller mills to run wild on prices without entangling the larger mills in the blame of consenting to what is done hereafter in making prices. The association price was 1.60c. at the mill, while some sales have been made of late as high as 2c. at the mill, and a quotation of 1.90c. is not uncommon. The smaller mills are quoting quite generally a $4 premium on the larger sizes of bessemer steel bars. Open-hearth steel bars not being so scarce have not been affected, and bar iron, while scarce, is the object of no such operations since the material available for sale is not so large in quantity. The selling of structural steel, both for quick shipment and for next year's delivery, has been very heavy in the last few days, and on the sales for immediate delivery the prices have ranged as heretofore quoted, the mills getting the same or in some instances higher prices than the jobbers. The quotations are ranging between 2.50c. and 3.25c. On next year's delivery the quotation is 1.70c. Cleveland. Rails are selling in large quantities for 1903 delivery, and the reports now are that fully 40,000 tons have already been sold.

Philadelphia. June 12.

(From Our Special Correspondent.)

Pig Iron.—It is simply impossible to give an intelligent and satisfactory report of the pig iron situation in Eastern Pennsylvania at this writing. The statements made by the various brokers and representatives of furnace interests are contradictory. The fact that appearances indicate a long anthracite coal strike has had a very disturbing effect on the market to-day.

Billets.—Statements concerning reported transactions in billets are confusing. It is understood that negotiations have been closed for additional supplies from abroad, and that immediate shipment is to be made. Transactions in domestic billets are subject to special agreement between buyers and sellers.

Bar Iron.—Storekeepers and representatives of mill interest say that a large amount of business is being done in a retail way in bar iron, both ordinary and refined. Steel bars are especially active.

Sheet Iron.—The demand just at present is for galvanized sheet iron for construction purposes. Orders have been placed at a premium over card rates, but very prompt deliveries are demanded.

Merchant Steel.—No important business has been done in merchant steel, although all kinds are very high and hard to get for anything but such delivery as mills see fit to specify.

Pipes and Tubes.—There is nothing new in regard to pipes, but a large amount of business has been transacted in tubes.

Plates.—A number of small orders have been placed aggregating altogether about 2,000 tons plate, and there is more business crowding in.

Steel Rails.—Two or three considerable orders for trolley work have been booked, but the actual price named is refused.

Old Rails.—There is an extraordinary demand and a very deficient supply. Buyers are urgent, and quotations have been advanced about 50c.

Scrap.—There is an extraordinary demand for everything in the way of heavy scrap. Light scrap is not much sought after.

Pittsburg. June 11.

(From Our Special Correspondent.)

As a result of the blast furnace workers' strike the production of pig iron was curtailed by fully 50,000 tons. All the furnaces are again in operation, except two that are closed for repairs, a settlement having been reached by the granting of a general advance of 10 per cent in wages. Most of the men accepted the compromise and returned to work on Sunday. The strike did not affect any of the furnaces in the Pittsburg District, being confined entirely to the Mahoning and Shenango valleys. No new business has been booked so far, but some large orders are expected to be placed shortly for delivery next year. It is believed that the highest point in prices has been reached, and indications are that there will be but little, if any, change throughout the coming year. The United States Steel Corporation has not contracted for any iron from the Valley furnaces since placing a big order for first quarter delivery. It is understood that more iron will be needed for this year's requirements. The monthly meeting of representatives of the subsidiary companies of the big steel combine will be held to-morrow at which the purchasing of pig iron for future requirements will be considered. The pig iron committee of the corporation likely will be instructed to open negotiations with the Bessemer Furnace Association, and a large order may be placed before the end of the month. It is probable that it will be necessary to purchase iron outside of the Valleys, as the furnaces are practically sold up for the rest of the year. Some are said to be oversold, and are away behind in deliveries. The sales of bessemer iron to independent steel concerns made during May aggregate 250,000 tons for deliveries extending to April 1, 1903.

There has been but little inquiry for finished products for early delivery. All the mills have orders in all lines that will keep them busy for several months. In structural material they are sold up for the balance of the year, and a large amount of business has been booked for 1903. The plate mills are equally crowded with orders, but in sheets and wire products the mills can take care of new business for this year, but most of them are sold up for 3 months. The plate pool met in New York last Thursday, which was the first meeting since April, and some of the mills represented insisted upon advancing prices, but the United States Steel Corporation objected, and no change was made. However, many of the mills are getting from $2 to $5 a ton above the pool price on early deliveries. As noted last week, steel rail prices for 1903 have been fixed at $28, and during the week orders for 600,000 tons were placed. It now seems certain that the production of rails this year will not be any larger than last year, and some of the orders taken will go over. It is estimated that the production next year will exceed 3,000,000 tons, as the big new plant of the Lackawanna Iron and Steel Company will be in full operation. There is a heavy demand, and relaying-rails bring from $2 to $4 a ton more than new rails.

A conference was held on Saturday between committees of the American Steel Hoop Company and the Amalgamated Association of Iron, Steel and Tin Workers on the request of the workers for additional concessions on the wage scale. No agreement was reached, and the question will again be taken up at a conference to be held next week. It was expected that the steel hoop combine would concede the terms accepted by the Republic Iron and Steel Company. A conference will be held with representatives of the American Sheet Steel Company to-morrow, at which an effort will be made to introduce some new features in the scale which has already been agreed to. All the wage scales have been signed by the Amalgamated Association, and there will be no suspension of operations at the close of the scale year on June 30, but at the annual convention of the workers' organization it was decided to ask for a number of changes in the foot notes.

Pig Iron.—No sales were made this week, and prices are practically unchanged. Bessemer pig iron is quoted at $21, Valley furnaces, and basic is about the same price. Gray forge is firmer, and $21, Pittsburg, is asked. Foundry iron is unusually scarce. No. 2 is quoted at $21.50@$22.50, Pittsburg, an advance of 50c. a ton.

Steel.—Bessemer steel billets are still offered at $36, but no sales were made. Some orders for German steel were placed during the week at $32.25 for billets and $33 for sheet bars. Shipments are promised for July. Steel bars are still quoted at 1.60c., but for early shipment 1.70c. is readily obtained. Tank plate remains at 1.60c., but higher rates are paid for prompt delivery.

Sheets.—The sheet market is dull this week, but little new business having been placed in black sheets, and No. 28 gauge is quoted as low as 3.05c. There is a good demand for galvanized sheets. No. 28 is quoted at 4.45@4.50c. in car-load lots.

Ferro-manganese.—Domestic 80 per cent is scarce, and the leading producer is not quoting a price this week. Imports of the British product have increased, and are quoted at $52@$55. The German product, which is of an inferior grade, is quoted at $49.

New York. June 13.

Pig Iron.—Prices for prompt delivery are still advancing, but the market is quiet. We quote for tidewater delivery: No. 1X foundry, $22@$23.25; No. 2X, $21@$22; No. 2 plain, $21. For Southern iron on dock, New York, No. 1 foundry, $21.50@$22; No. 2, $20@$21; No. 3, $19@$20.

Bar Iron and Steel.—Business is steady. We quote on large lots on dock: Refined bars, 1.95@2c.; soft steel bars, 1.83c.

Plates.—The base rate is to remain at 1.78c. for tank, but sales are at the advance. We quote for tide-

water delivery in car-loads: Tank, ¼-in. and heavier, 2@2.10c; flange, 2.05@2.15c.; marine, 2.15@2.25c.; universal, 1.95@2.05c.

Steel Rails.—Standard sections are quoted at $28. Light rails are $30@$33, according to weight.

Structural Material.—The market is quiet, but consumption continues heavy. We quote for forward delivery on large lots at tidewater as follows: Beams, 2@2.20c.; tees, 1.95@2.15c.; angles, 1:95@2.25c.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 852.)

New York. June 12.

Heavy Chemicals.—Though consumers are anxious to lay in larger stocks than usual, owing to the coal strike, which may interfere with production, the domestic makers are unwilling to book any number of early delivery orders. Consequently, present business is mostly on contracts taken some time ago. A few new orders for 1903 domestic high-test caustic soda have been placed, on basis of $1.85@$1.87½ per 100 lbs., f. o. b. works, and for alkali at 75@77c., f. o. b. works. Domestic chemicals, we quote, per 100 lbs., f. o. b works, as follows: High-test alkali, in bags, 80@85c. for prompt shipment, and 75@77½c. for forward; caustic soda, high-test, $1.90@$1.95 for early delivery, and $1.85@$1.87½ for futures; bicarb. soda, ordinary, 95c., and extra, $3; sal soda, 55c.; chlorate of potash, $8@$8¼ for prompt, and $7.75 for forward contracts; bleaching powder, off-test, $1.35; best grades mostly under contract. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90@92½c.; caustic soda, high-test, $2.25; sal soda, 67½c.; chlorate of potash, $10¼@$10¾; bleaching powder, prime brands, $1.60@$1.87½, according to make.

Acids.—Contract deliveries are pretty good for this season, and prices firm.

Quotations are per 100 lbs., as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars), delivered in New York and vicinity.

Blue Vitriol	$4.50@4.62½	Oxalic, com'l	$4.60@ 5.00
Muriatic, 18 deg.	1.50	Sulphuric, 50 deg., bulk, ton	13.50@15.50
Muriatic, 20 deg.	1.62½	Sulphuric, 60 deg.	1.00
Muriatic, 22 deg.	1.75	Sulphuric, 60 deg., bulk	18.00@20.00
Nitric, 36 deg.	4.00	Sulphuric, 66 deg.	1.20
Nitric, 38 deg.	4.25	Sulphuric, 66 deg., bulk	21.00@23.00
Nitric, 40 deg.	4.50		
Nitric, 42 deg.	4.87½		

Brimstone.—The firmer foreign market, owing to enhanced ocean freight rates, has raised best unmixed seconds for shipment to $22.50 per ton, while spot is nominal at $23. Best thirds are about $2½ less than seconds. The average price of best unmixed seconds on spot in May was $23.16, and shipments $22.44, showing a falling off since last October. In the 5 months ending May 31, 1902, the average price of spot seconds was $23.76, and shipments $22,86, showing an increase of $1.22 and $1.43, respectively, as compared with the corresponding period last year. Best thirds this year sold at about $2.50 per ton less than seconds, whereas last year the difference was $2; nevertheless prices this year show an increase of 72c. per ton for spot and 93c. for shipments.

Exports of brimstone from Sicily in April, amounting to 58,346 tons, are the largest in 11 months, but as compared with April, 1901, show a decrease of 8,430 tons. In the 4 months ending April 30 the total exports were 194,522 tons, as against 212,479 tons last year, showing a falling off of 17,957 tons, or over 8 per cent. The imports into the United States during this period were 59,900 tons, or 10,662 tons more than last year. Stocks in Sicily on April 30, 1902, were 251,815 tons, which is the smallest quantity since last September, but 59,880 tons larger than April, 1901.

Pyrites.—Imports at New York this week were 3,505 tons iron pyrites from Huelva, Spain. Of late imports have been quite large, showing an improved demand and good prices. Freight rates continue firm. Quotations are f. o. b. Mineral City, Va.; lump ore, $5 per ton, and fines, 10c. per unit; Charlemont, Mass., lump. $5, and fines, $4.75. Spanish pyrites 12@13c. per unit, New York and other Atlantic ports. Spanish pyrites contain 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—There is strength in the market, superinduced by a good demand abroad and small stocks. Sellers of gas liquor are asking up to $3.17½ per 100 lbs. for this month's arrivals. In May the average price was $3.07, which is the highest point in some time.

Nitrate of Soda.—The market is firm, as the situation in Chile has improved and importers in New York are not as anxious to sell as they were a little while ago. Spot and nearby arrivals are quoted at $2 per cent for the year 1901; Agua Santa Nitrate and $1.95 at Baltimore.

The Santa Rita Nitrate Company has declared a final dividend of 5s. per share, tax free, making 10 per cent for the year 1901; Agua Santa Nitrate and Railway Company, an intermin dividend of 3 per cent, making 6 per cent for the year, and the Anglo-Chilean Nitrate and Railway Company 14s. per preference share. All carry a fair balance to next year's account, after providing for amortization, etc.

Phosphates.—Sales for future shipments are more frequent. Prices are practically unchanged.

In mining centers attention has been attracted to the development of new territory, and some good sales of land in Florida and Tennessee are reported. In Polk County, Fla., the Greenhead Phosphate Company recently purchased 400 acres of high-grade pebble land. Already a modern plant is erected, and sufficient orders are in hand at fair prices to keep it running some time. The capacity of the plant is 200,000 tons annually.

The shipments of Florida high-grade rock in the 4 months ending April 30 are reported by Messrs. Auchincloss Brothers at 131,061 tons, of which 82,929 tons went to Continental ports, 21,044 tons to Baltic, 19,030 tons to the United Kingdom, and 8,058 tons to the Mediterranean. Compared with last year, the total shipments show an increase of only 330 tons.

In May the exports of Florida high-grade rock from Savannah amounted to 21,287 tons, showing a substantial increase over previous months. Of the total, Germany received 11,956 tons, Holland 6.581 tons, and Denmark 2,750 tons.

We quote phosphate prices below:

Phosphates.	Per ton F. o. b.	C. i. f. Un. Kingdom or European Ports. Unit.	Long ton.
*Fla. hard rock (78@80%)	$6.50@$7.00	6¼@6¾d.	$9.75@10.53
*Fla. land peb. (68@73%)	3.00@3.25	4¾@5d.	6.65@ 7.00
*Fla. Peace Riv. (58@63%)	2.25@2.50	4¾@5d.	5.70@ 6.00
†Tenn., (78@80%) export	3.50@3.75	5½@6d.	8.58@ 9.36
†Tenn., 78% domestic	3.00@3.25	.....	.....
†Tenn., 75% domestic	2.75@3.00	.....	.....
†Tenn., 73@74% domestic	2.40	.....	.....
†Tenn., 70@72% domestic	2.10@2.25	.....	.....
‡So. Car. land rock	3.25	4½@5d.	5.67@ 6.30
‡So. Car. river rock	2.75@3.00	.....	.....
Algerian (63@68%)	.....	5¾@6½d.	7.48@ 8.45
Algerian (58@63%)	.....	5¼@6d.	6.30@ 7.20
Algerian (53@58%)	.....	5 @5¼d.	5.50@ 5.78

*Fernandina, Brunswick or Savannah.
†Mt. Pleasant. ‡On vessels, Ashley River.

Liverpool. May 28.

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

While the market for heavy chemicals is still quiet, manufacturers report a rather better inquiry during the past few days.

Messrs. Brunner, Mond & Co., Limited, have issued their report for the 12 months ending March 31 last, showing a profit of £480,431, out of which the directors propose to pay a dividend on the ordinary stock for the six months ending March 31 at the rate of 35 per cent per annum, making with the interim dividend paid on account of the previous 6 months, a dividend for the 12 months of 32½ per cent, in addition to placing £60,000 to suspense account, £2,500 to patents account and carrying forward £37,701 to next account. Although the dividend on the ordinary stock is 2½ per cent less than for the previous 12 months, the shareholders are to be congratulated on the fine result.

Soda ash keeps firm at the usual varying prices as to market. For tierces the nearest spot range may be called about as follows: Leblanc ash, 48 per cent, £5 15s.@ £6; 58 per cent, £6 2s. 6d.@£6 7s 6d. per ton, net cash. Ammonia ash, 48 per cent, £4 5s.@£4 10s.; 58 per cent, £4 10s.@£4 15s. per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in fairly good request, at generally £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda is in better demand and quotations steady, as follows: Sixty per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Bleaching powder is without improvement, and £6 12s. 6d.@£6 15s. per ton, net cash, is about nearest range for unbarred makes of hardwood, with special quotations for Continental and other export quarters. Chlorate of potash is slow as regards new business, at 3d. per lb., net cash. Bicarb. soda meets with a fair inquiry at £6 15s. per ton, less 2½ per cent for the finest quality in 1 cwt. kegs, with usual allowances for larger packages; also special quotations for a few export quarters. Sulphate of ammonia continues scarce, and £13 2s. 6d.@£13 5s. per ton, less 2½ per cent, is asked by holders; for good gray, 24@25 per cent in double bags, f. o. b. here. Nitrate of soda continues to drop, and £9 5s.@£9 10s. per ton, less 2½ per cent, is now about nearest spot range for double bags, f. o. b. here, as to quality.

METAL MARKET.

New York. June 12

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At all United States Ports in April and Year.

Metal	April. 1901.	April. 1902.	Year. 1901.	Year. 1902.
Gold.				
Exports	$4,916,965	$2,844,204	$14,045,205	$18,167,341
Imports	2,249,038	1,864,767	10,894,393	7,563,507
Excess.	E. $2,667,927	E. $979,437	E. $3,150,812	E. $10,603,840
Silver.				
Exports	$4,959,047	$3,739,600	$19,478,721	$15,502,253
Imports	2,370,114	2,051,251	10,455,207	8,460,730
Excess.	E. $2,588,933	E. $1,688,349	E. $9,023,514	E. $7,041,523

These figures include the exports and imports at all United States ports, and are furnished by the Bureau of Statistics of the Treasury Department.

Gold and Silver Exports and Imports, New York.

For the week ending June 12, and for years from January 1, 1902, 1901 and 1900:

Period.	Gold. Exports.	Gold. Imports.	Silver. Exports.	Silver. Imports.	Total Excess Exports or Imports.
Week	$8,300	$97,027	$299,593	$24,027	E. $186,779
1902	16,482,965	1,195,089	13,289,145	521,913	E. 28,055,108
1901	20,416,990	1,206,158	14,988,920	1,829,411	E. 32,370,341
1900	17,902,013	1,426,062	17,813,609	1,367,860	E. 32,321,700

The gold export this week went to the West Indies. The silver went principally to London. Imports were from Central and South America and the West Indies.

Financial Notes of the Week.

General business continues active, and is little affected by the comparative stagnation in the stock markets. Crop reports are still favorable.

Exports of specie from San Francisco in May included $637 in gold bullion, $1,480 in gold coin, $263,235 in silver bullion, and $33,007 in foreign silver coin; making $2,117 gold and $296,242 silver. For the 5 months ending May 30 the total shipments were as follows, in value:

	1901.	1902.	Changes.
Gold	$23,148	$748,949	I. $725,801
Silver	1,358,324	2,056,825	I. 698,501
Total	$1,381,472	$2,805,774	I. $1,424,302

The large increase in gold this year was due entirely to a special shipment of $732,000 in gold bars to Japan, made in February.

The statement of the New York banks, including the 63 banks represented in the Clearing House, for the week ending June 7 gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts	$806,751,600	$887,599,188	$884,266,900
Deposits	893,745,400	972,118,800	945,896,500
Circulation	22,878,800	30,933,400	31,466,400
Specie	169,551,100	179,029,700	172,215,600
Legal tenders	72,259,500	77,341,500	75,544,100
Total reserve	$241,810,600	$256,371,200	$247,759,700
Legal requirements	223,436,350	243,029,700	236,474,125
Balance surplus	$18,374,250	$13,341,500	$11,285,575

Changes for the week, this year, were an increase of $221,100 in circulation, and decreases of $1,325,700 in loans and discounts, $2,249,900 in deposits, $321,000 in specie, $929,900 in legal tenders, and $643,425 in surplus reserve.

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

	1901. Gold.	1901. Silver.	1902. Gold.	1902. Silver.
N. Y. A'd	$179,029,700	.....	$172,215,600	.....
England	183,191,140	.....	182,754,280	.....
France	461,576,795	$223,517,790	511,643,895	$224,188,050
Germany	170,950,000	73,265,000	196,130,000	71,860,000
Spain	70,015,000	84,750,000	70,625,000	93,395,000
Neth'l'ds	27,096,500	28,762,000	25,200,500	33,982,000
Belgium	14,535,000	7,270,000	15,783,335	7,891,665
Italy	75,840,000	9,847,000	80,810,000	10,948,000
Russia	372,640,000	36,565,000	370,480,000	44,685,000

The returns of the Associated Banks of New York are of date June 7, and the others June 5, as report-

ed by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

The silver market is fairly steady, spot supplies in London being somewhat limited. The price is ⅛d. higher than futures, which to-day are ruling at 24d. The United States Assay Office in New York reports receipts of 62,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to May 29 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.		Changes.
India	£3,339,710	£3,122,725	D.	£216,985
China	339,125	16,500	D.	322,625
The Straits	79,976	62,650	D.	17,326
Totals	£3,758,811	£3,201,875	D.	£556,936

Arrivals for the week, this year, were £88,000 in bar silver from New York, and £8,000 from the West Indies; total, £96,000. Shipments were £73,000 in bar silver to Bombay.

Indian Exchange remains fairly steady, the Council bills offered in London having been taken at an average of 15.91d. per rupee, though the demand was not large, only 30 lakhs of rupees having been sold. The total sales of bills for the two months of the Indian fiscal year, from April 1 to May 31, were 30,475,611 rupees, against 44,101,792 rupees in the corresponding months last year.

The exports of gold from Australia for the 4 months ending April 30 were as follows:

	1901.	1902.		Changes.
Melbourne	£1,659,682	£1,390,623	D.	£269,059
Sydney	458,509	360,743	D.	97,766
Freemantle	1,492,217	1,836,084	I.	343,867
Total	£3,610,408	£3,587,450	D.	£22,958

Of the exports this year, £77,426 went to China, £1,341,311 to India and £650,000 to South Africa. No exports to the United States are reported this year.

The movement of gold and silver in France for the 4 months ending April 30 is reported by the Ministry of Commerce as below:

Gold.	1901.	1902.		Changes.
Imports	Fr. 124,684,000	Fr. 193,386,000	I.	Fr. 68,702,000
Exports	18,314,000	19,093,000	I.	779,000
Excess	Imp. 106,370,000	Imp. 174,293,000	I.	67,923,000
Silver:				
Imports	32,402,000	32,872,000	I.	470,000
Exports	58,920,000	29,452,000	D.	29,468,000
Excess	Exp. 26,518,000	Imp. 3,420,000		

Imports of copper and nickel coins at their face value amounted to 31,000 fr., against 29,000 fr. for the corresponding period in 1901. Exports were 1,104,000 fr., against 75,000 fr. last year.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$0.41½	$0.44
Peruvian soles and Chilean pesos	.37½	.41½
Victoria sovereigns	4.86	4.88
Twenty francs	3.86	3.88
Twenty marks	4.74	4.85
Spanish 25 pesetas	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

June	Sterling Exchange	Silver N. Y. Cts.	Silver London Pence.	Copper Lake Cts. per lb.	Copper Electrolytic per lb.	Copper London £ per ton.	Tin, cts. per lb.	Lead cts. per lb.	Spelter N.Y. cts. per lb.	Spelter St. L. cts. per lb.
6	4.87⅛	52	24	12½	12⅛ @12¼	54⅞	30¼	4.05 @4.10	4.87½ @5.00	4.62½ @4.75
7	4.87⅛	51¾	23 15/16	12½	12⅛ @12¼	....	30½	4.05 @4.10	4.87½ @5.00	4.62½ @4.75
9	4.87⅛	51¾	23 15/16	12½	12⅛ @12¼	54½	30¼	4.05 @4.10	4.87½ @5.00	4.62½ @4.75
10	4.87⅛	51⅞	23 15/16	12½	12⅛ @12¼	54⅜	30½	4.05 @4.10	4.87½ @5.00	4.62½ @4.75
11	4.87⅛	52⅛	24 1/16	12½	12⅛ @12¼	54⅜	30½	4.05 @4.10	4.87½ @5.00	4.62½ @4.75
12	4.87⅛	52¼	24⅛	12½	12⅛ @12¼	54½	30½	4.05 @4.10	4.87½ @5.00	4.62½ @4.75

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

Copper.—The market is devoid of any special feature, and has been quiet and dull. Consumption of copper continues excellent, but it appears that for the moment buyers have covered their wants. We quote Lake at 12½c., electrolytic in cakes, ingots and wire bars at 12⅛@12¼c.; in cathodes, at 11⅞@12c.; casting copper, at 12¼c.

The London market for speculative sorts, which closed last Thursday at £54 for spot and 3 months, was £54 6s. 3d. for spot, £54 10s. for 3 months on Friday; on Monday it was about 5s. higher, 2s. 6d. of which, however, were again lost on Tuesday. On Thursday the market closed at £54 5s. for spot, £54 7s. 6d. for 3 months.

Refined and manufactured sorts we quote: English tough, £57@£57 10s.; best selected, £58 10s@£59; strong sheets, £59; India sheets, £66; yellow metal, 6¼d.

Exports of copper from New York, Philadelphia and Baltimore for the week ending June 11 are reported by our special correspondents as follows: Great Britain, 383 tons; Holland, 535; France, 1,412; Belgium, 232; Italy, 100; Sweden, 20; Russia, 10; Brazil, 38; total, 2,730 tons. Imports were 54 tons copper from Mexico and 25 tons from Japan, also 330 tons ore from London.

Imports of copper into Germany for the 4 months ending April 30 were 26,137 metric tons, against 20,901 tons for the corresponding period in 1901; showing an increase of 5,236 tons, or 25.1 per cent this year. Exports of copper for the same period were 1,394 tons, against 1,583 tons last year.

Tin.—A fair business has been done. In spite of the decline abroad our market is not only holding its own, but shows an advancing tendency for near-by deliveries. Consumption is excellent. At the close we quote spot at 30½c., June delivery at 29¾c., July at 29¼c.

The foreign market, which closed last Thursday at £132 15s. for spot, £129 7s. 6d. for 3 months, declined steadily. On Tuesday of this week it reached £130 15s. for spot, £127 5s. for 3 months, and on Thursday it was £130 10s. for spot, £125 5s. for 3 months, with a somewhat better tendency at the close.

Lead.—The market is unchanged, and we quote 3.97½@4.05c. St. Louis, 4.05@4.10c. New York.

The foreign market is slightly lower, Spanish lead being quoted at £11 5s.@£11 6s. 3d., English lead at £11 10s.@£11 11s. 3d.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead continues uninteresting. Missouri lead sells at 3.95@3.97½c., according to brand and delivery. Desilverized brings 4.05c.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of May 24, as follows: The price of silver during the week has been 13 reales per ounce. The exchange has been 34.48 pesetas to £1. The local quotation for pig lead on wharf has been 64.75 reales per quintal, which on the above exchange is equal to £10 10s. 3d. per ton of 2,240 lbs., f. o. b. Cartagena. Exports of pig lead have been 1,014,384 kgs. to Marseilles; 915,799 kgs. to oLndon; a total of 1,930,183 kilograms.

Spelter.—The market has been active, and a good business has been done for both near-by and distant deliveries at advanced prices. We quote 4¾c. St. Louis, 4⅞@5c. New York.

The foreign market is a little higher, good ordinaries being quoted at £18 12s. 6d., specials 5s. higher.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is strong and very scarce. The latest sales are on a basis of 4.60@4.62½c., with every probability of a higher market in the near future.

Silesian Spelter Market.—Herr Paul Speier writes from Breslau under date of May 30 that the stronger tendency apparent in March continued through April, though at the close of the month there was some stagnation in business, buyers having apparently withdrawn from the market for the time being. Quotations for good ordinary brands are 18.15@18.50 marks per 50 kgs., f. o. b. cars at Breslau. This is equivalent to an average of 3.96c. per lb. The imports and exports in Germany for the 4 months ending April 30 were as follows, in metric tons:

	—Imports.— 1901.	1902.	—Exports.— 1901.	1902.
Spelter	11,228	13,846	23,881	44,190
Zinc sheets	226	71	7,881	11,423
Zinc scrap	478	564	844	1,224
Zinc white	2,384	2,007	7,856	12,229
Lithoprone	1	27	3,646	5,066
Zinc ore	47,112	42,537	24,278	36,331

The increase in exports of all descriptions was large, showing a considerable improvement in trade.

Antimony.—Is unchanged. We quote Cookson's at 9¾@10c.; Hallett's, 8¼c.; Hungarian, Italian, Japanese and United States Star at 8c.

Nickel.—The price continues firm at 50@60c. per lb., according to size and terms of order.

Platinum.—Consumption continues good. Ingot platinum in large lots brings $19 per oz. in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 76c. per gram.

Quicksilver.—The New York price is $48 per flask for large lots, with a slightly higher figure asked for small orders. In San Francisco quotations are $45.50 @$46.50 for domestic orders, with $42.50@$43 quoted for export. The London price is £8 15s. per flask, with the same figure quoted from second hands.

Quicksilver receipts at San Francisco in May are reported by our special correspondent at 1,945 flasks. Exports from San Francisco for the month were: Alaska, 153 lbs.; British Columbia, 765; Colombia, 1,606; Honduras, 15,529; Salvador, 153; Mexico, 11,412; total, 29,618 lbs., or 387 flasks.

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

Aluminum.	Per lb.		Per lb.
No. 1, 99% ingots	33@37c.	Ferro-Tungsten (37%)	28c.
No. 2, 90% ingots	31@34c.	Magnesium	$2.75
Rolled sheets	4c up	Manganese, pure (N.Y.)	60c.
Alum-bronze	20@23c.	Mangan'e Cop. (20% Mn)	32c.
Nickel-alum	33@39c.	Mangan'e Cop. (30% Mn)	38c.
Bismuth	$1.50	Molybdenum (Best)	$1.82
Chromium, pure (N.Y.)	80c.	Phosphorus	50c.
Copper, red oxide	50c.	American	70c.
Ferro-Molyb'um (50%)	$1.25	Sodium metal	50c.
Ferro-Titanium (10%)	90c.	Tungsten (Best)	62c.
Ferro-Titanium (20@25%, N. Y.)	55c.		

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

Our London correspondent reports that the current price of tungsten powder (best) 96 to 98 per cent., delivered Sheffield or f. o. b. Liverpool, is 1s. 5d. (34c.) per lb.

Average Prices of Metals per lb., New York.

Month.	Tin. 1902.	Tin. 1901.	Lead. 1902.	Lead. 1901.	Spelter 1902.	Spelter 1901.
January	23.54	26.51	4,000	4.350	4.27	4.13
February	24.07	26.68	4.075	4.350	4.15	4.01
March	26.32	26.03	4.075	4.350	4.28	3.91
April	27.77	25.93	4.075	4.350	4.37	3.98
May	29.85	27.12	4.075	4.350	4.47	4.04
June	....	28.60	....	4.350	...	3.99
July	....	27.85	....	4.350	...	3.95
August	..	26.78	....	4.350	...	3.99
September	....	25.31	....	4.350	...	4.08
October	....	26.62	....	4.350	...	4.23
November	....	26.67	....	4.350	...	4.29
December	....	24.36	....	4.153	...	4.31
Year	....	26.54	....	4.334	...	4.08

Average Prices of Copper.

Month	New York Electrolytic. 1902.	1901.	Lake. 1902.	1901.	London Standard. 1902.	1901.
January	11.053	16.25	11.322	16.77	48.43	71.78
February	12,173	16.38	12,378	16.90	55.16	71.17
March	11.882	16.42	12.188	16.94	53.39	69.54
April	11.618	16.43	11.986	16.94	52.79	69.61
May	11.856	16.41	12.226	16.94	54.03	69.60
June	....	16.38	....	16.90	....	68.83
July	....	16.31	....	16.61	....	67.60
August	....	16.25	....	16.50	....	66.34
September	....	16.25	....	16.54	....	65.97
October	....	16.25	....	16.60	....	64.11
November	....	16.224	....	16.33	....	64.51
December	....	13.845	....	14.36	....	52.34
Year	....	16.117	....	16.53	....	66.79

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower.

Average Prices of Silver, per ounce Troy.

Month.	1902. London. Pence.	1902. N. Y. Cents.	1901. London. Pence.	1901. N. Y. Cents.	1900. London. Pence.	1900. Y. Y. Cents.
January	25.62	55.56	28.97	62.82	27.30	59.30
February	25.41	55.09	28.13	61.06	27.40	59.76
March	25.00	54.23	27.04	60.63	27.59	59.81
April	24.34	52.72	27.30	59.29	27.41	59.59
May	23.71	51.31	27.43	59.64	27.56	59.90
June	....	....	27.42	59.57	27.81	60.42
July	....	....	26.96	58.46	28.23	61.25
August	....	....	26.94	58.37	28.13	61.14
September	....	....	26.95	58.26	28.85	62.63
October	....	....	26.62	57.59	29.58	63.83
November	....	....	26.12	56.64	29.66	64.04
December	....	....	25.46	55.10	29.68	64.14
Year	....	....	27.11	58.95	28.27	61.33

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

STOCK QUOTATIONS.

NEW YORK.

Company and Location.	par val	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 7. H.	June 7. L.	June 9. H.	June 9. L.	June 10. H.	June 10. L.	June 11. H.	June 11. L.	Sales
Acacia, Colo.	$1													
Alamo, Colo.	1													
Amalgamated c., Mont	100	68.88	67.75	68.13	67.25	68.63	68.25	68.75	68.25	69.00	68.13	69.25	68.88	55,170
*Anaconda c., Mont.	25	118⅛	116.	113½	.....	113¾	.....	113¾	.....	114.	113½	113½	113.	2,800
Anaconda Gold, Colo.	5													
Argentum-Jun., Colo.	2													
Belcher, Nev.	3													
Best & Belcher, Nev.	3													
Brunswick, Cal.	1					.10				.10				
Comstock T., Nev.	100	.06												1,700
Comstock Bonds, Nev.	100													
Con. Cal. & Va., Nev.	2½	1.50		1.45		1.45				1.40	1.35			400
Cripple Cr. Con., Colo.	1													
Elkton, Colo.	1	.67						.66						400
Golden Fleece, Colo	1											.22		300
Greene Con., Mex.	1	28.50	28.00	27.75	27.50	27.75	27.63	27.75	27.50	28.13	27.50	28.25	27.75	15,535
Hale & Norcross, Nev.	1													
Horn Silver, Utah	25													
Isabella, Colo.	1			.28		.28				.28				1,200
Jack Pot, Colo.	1									.14				300
King & Pemb., Ont.	10			.13										300
Little Chief, Colo.	1							.13						500
Mexican, Nev.	3							.53				.50	.48	700
Mine Securities, U. S.	60	6.75		7.00	6.88	7.00		6.88	6.75	7.00	6.75	6.75		2,250
Mollie Gibson, Colo.	5			.18		.17		.16				.12		1,000
Moon A'c'r.	5	.15						.15						1,500
Ontario, Utah	100													
Ophir, Nev.	1	1.25		1.25		1.20				1.15		1.15		
Pharmacist, Colo.	1													
Phoenix, Ariz.	1													
Portland, Colo.	3	1.75										1.70		
Potosi, Nev.	100	.35	.34	.25										
Quicksilver, Cal.	100													
Quicksilver pf., Cal.	3	9.50												100
Sierra Nevada, Nev.	20													
Standard Con., Cal.	10					3.45								100
Tenn. C., Tenn.	25	13.50	13.00	13.50	13.00	13.50	13.25	13.25	12.38	15.38	12 00	15 25	14.63	49,054
Union Copper, N. C.	10	4.00	3.75	4.00	3.75	3.75	3.63	3.75	.....	3.88	3.75	4.75	3.88	6,158
White Knob, Ida.	100	22.50	22.25	22.50	21.75	22.25	21.75	22.00	21.75	21.88	21.25	22.00	21.25	525
Work, Colo.	1													

*Per cent.

Coal and Industrial Stocks.

Am. Agr. Chem., U.S.	100	.....	.....	25	.....	25	.....	85	.....	28½	85½	25½	.....	
Am. Agr. Chem. pf, U.S.	100	85	.....	85	.....	.....	.....	88	85½	88	.....	85½	.....	
Am. Car & Fdy., U.S.	100	31⅛	30¾	31¼	30¼	31	.....	31⅞	34	32½	32	32⅝	32⅜	34,500
Am. Car & Fdy. pf, U.S.	100	.....	.....	90¾	.....	.....	.....	91	93½	91¾	91¼	91⅜	91	1,490
Am. Sm. & Ref., U.S.	100	49	48¼	48⅞	48¼	48¾	48⅞	48¾	48¼	48⅞	48¾	49	48¼	11,325
Am. Sm. & Ref. pf, U.S.	100	98⅝	58	98½	98¼	.....	.....	99	98⅝	99	.....	99⅜	99	4,290
Col. Fuel & L., Colo.	100	99	97¼	99	97½	99¼	98½	99⅛	98½	99½	99¼	101½	99	14,300
Col. & H. C. & I., Colo.	100	.....	.....	17	.....	.....	.....	17	16½	16¾	16¾	16⅜	.....	910
Int'l S. Pump, U.S.	100	54	53	54	53	53	.....	54	53	53	.....	.....	.....	900
Int'l S. Pump pf, U.S.	100	93	87	89	.....	.....	.....	93	85	93	85	93	88	.....
Mong. R. Coal, Pa.	100	12⅞	.....	12⅝	.....	12⅞	.....	12⅞	.....	.....	.....	.....	.....	2,762
Mong. R. Coal pf, Pa.	100	42¼	42⅛	42¼	.....	42¼	.....	.....	.....	42⅛	42	.....	.....	1,187
National Lead, U.S.	100	22¼	21½	21¾	21½	21⅜	.....	22½	22	22¾	22	22⅞	22½	4,500
National Lead pf, U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
National Salt, U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
National Salt pf, U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Pittsburg Coal, Pa.	100	24	.....	24	.....	.....	.....	24	.....	24½	24	24¼	24	744
Pittsburg Coal pf, Pa.	100	89⅝	89¼	89¾	89⅝	89¾	.....	89¾	.....	89¾	89¼	89⅝	89¼	594
Pressed Steel Car, Pa.	100	47½	47	47	46¼	46¾	46½	47¼	46¾	47	46¼	47⅛	47	10,150
Republic I & S., U.S.	100	17¼	.....	17¼	17⅛	17⅝	17⅝	17⅝	.....	17⅜	.....	18¼	18	3,950
Republic I. & S., pf, U.S.	100	74	73½	74	73¼	74	.....	74½	.....	74⅜	74½	75¼	74⅜	2,400
Sloss-Shef S. & I., Ala.	100	32	30	32	30	32	30	.....	.....	33	31	33	31	.....
Sloss-Shef S. & I. pf, Ala.	100	82	80	81	.....	82	80	82	.....	82½	82	82½	82	230
Standard Oil, U.S.	100	625	621	625	620	622	621	621	620	625	623	625	.....	147
Tenn. C. I. & R. R., Ala.	100	63⅝	63	63¼	61½	62½	62⅛	62¾	.....	63½	63	64⅜	63½	8,700
U. S. Red. & Ref., Colo.	100	41	39	39½	39	40	39	39¼	.....	40	39	40	39⅜	400
U.S. Red. & Ref. pf, Colo	100	63	62½	64	62	66	62	.....	.....	64½	62	65½	.....	160
U.S. Steel Corp., U.S.	100	37⅞	35½	37⅞	35½	40	35⅞	†39	38¾	39	38¾	39¼	38⅞	62,434
U.S. Steel Corp. pf, U.S.	100	89⅝	88¾	89¼	88¾	89¼	88⅞	89⅜	88⅞	89⅜	88⅝	89⅜	89	41,835
Va.-Car Chem., U.S.	100	69¾	69½	70	69¾	70	69¾	69⅞	.....	70⅜	70	70	69⅞	900
Va.-Car Chem. pf, U.S.	100	131⅜	.....	131⅜	131	131⅜	131	.....	.....	131⅜	131	131½	131	160

Total sales, 350,910 shares. Ex-dividend

PHILADELPHIA, PA. §

Name and Location of Company.	par val	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 7. H.	June 7. L.	June 9. H.	June 9. L.	June 10. H.	June 10. L.	June 11. H.	June 11. L.	Sales
Am. Alkali	$50	.50	.....	.....	.....	.....	.....	.....	.....	.63	.....	.....	.....	300
Am. Cement	10	2.75	7.18	7.25	.....	7.25	7.13	7.13	.....	7.25	.....	7.25	.....	3,015
Beth. Iron, Pa.	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Beth. Steel, Pa.	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Cambria Iron, Pa.	50	47.50	.....	47.63	.....	.....	.....	.....	.....	.....	.....	47.50	.....	64
Cambria Steel, Pa.	50	23.25	.....	23.50	.....	23.50	.....	23.13	.....	23 50	23.38	23.50	23.38	1,678
Susq. I. & S., Pa.	10	.....	.....	.....	.....	.....	.....	2.38	.....	2.50	.....	2.25	.....	1,845
†United Gas I. Pa.	50	104	103½	103¾	103⅜	103⅝	103	104	103½	106¾	104⅜	107	106	4,906

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 11,808 shares.
†Ex-privileges.

MEXICO. May 24.

Name of Company	Shares.	Last div'd	Prices. Bid.	Prices. Ask.
Durango:				
Ca. Min. de Penoles	2,500	$50.00	$4,150	$4.250
Angustias, Pozos	2,400	5.00	65	75
Guananjuato:				
Cinco Senores y An., aviada	2,000	15.00	300	310
Cinco Senores y An., aviada	400	10.00	250	255
Providencia, San Juan de la Luz	6,000	2.00	195	200
Guerrero:				
Garduno y Anexas.	7,200	.....	30	50
Hidalgo:				
Amistad y Concordia.	9,600	3.75	54	55
Carmen, aviada.	1,100	.....	250	300
Ca. Real del Monte	2,554	.....	450	550
El Encino, aviador	1,120	.....	40	.....
Guadalupe Fresnillo y Annexas.	1,000	.....	220	300
La Blanca, aviada.	1,536	.....	500	520
La Blanco, aviada.	768	.....	280	290
Maravillas y An., aviador	1,680	.....	300	320
Maravillas el Lobo	1,000	.....	200	250
Palma y An., aviador	1,800	.....	10	.....
Sta. Gertrudis y An., aviador	9,600	.....	9½	10
Sta. Gertrudis y An., aviador	28,800	0.50	63¼	64½
Santo Tomas Apostol aviador	5,100	.....	5	7
San Rafael y An., aviada.	1,200	12.00	640	650
San Rafael y An., aviada.	1,200	8.00	285	295
Solodad, aviada.	960	5.00	275	280
Sorpressa, aviada.	960	5 00	180	190
Mexico:				
Alacran	2,400	.....	$40	$55
La Esperanza (El Oro)	3,000	$10.00	780	800
Socovon de S. Fern.	2,500	.....	20	30
Michoacan:				
Luz de Borda, aviador	3,000	.....	34	36
Luz de Borda, aviada	1,000	.....	10	12
San Luis Potosi:				
Concepcion y An.	3,000	.....	115	120
El Barreno, aviador.	2,000	2.00	17	20
Sta. Maria de la Pa.	2,400	10.00	565	575
Santa Fe.	2,400	.....	20	30
San Diego y Annexas.	2,400	4.00	75	80
Zacatecas:				
Candelaria y Pinos	2,500	.....	270	290
San Carlos y Annexas	2,500	10.00	270	280
Sta. Maria de Gaud.	2,500	10.00	345	350
Miscellaneous:				
Bartolome de Medina	2,000	1.50	50	55
Guadalupe Hacienda	10,000	2.00	230	235
La Luz Hac. (Pachuca)	3,750	.....	65	80
La Reina (Chihuahua)	192	.....	2,500	3,500
Naica (Chihuahua)	100	.....	4,500	5,000
Natividad (Oaxaca) aviador	1,800	4.00	480	520
National (Oaxaca) aviador	1,800	4.00	400	500
San Francisco Hac.	6,000	2.00	165	170
Santa Ana Huantla Morelos	4,000	.....	50	19
Union Hacienda	3,000	5.00	180	195

BOSTON, MASS.

Name of Company.	par val	Shares listed.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 7. H.	June 7. L.	June 9. H.	June 9. L.	June 10. H.	June 10. L.	June 11. H.	June 11. L.	Sales.
Adventure Con., c	$25	100,000	23.00	.....	.....	.....	.....	.....	23.75	23.00	23.88	23.75	.....	.....	460
Aetna Cons.	5	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Allouez, c.	25	80,000	.....	.....	.....	.....	3.25	.....	3.75	3.00	3.00	.....	3 00	.....	820
Amalgamated, c.	100	1,500,000	68.88	67.75	88.38	87.38	68.50	68.00	68.88	68.13	69.00	68.13	69.13	68.75	7,880
Am. Gold Dreg.	5	90,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Am. Z. L. & Sm.	25	60,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Anaconda, c.	25	1,200,000	.....	.....	.....	.....	28 63	.....	.....	.....	.....	.....	.....	.....	200
Arcadian, c.	25	150,000	5.25	.....	.....	.....	.....	.....	5.50	5.00	5 00	4.75	5.00	.....	1,085
Arnold, c.	25	60,000	.80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250
Atlantic, c.	25	40,000	32.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	220
Baltic	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Bingham, Cons.	50	150,000	35.00	.....	35.00	.....	35.00	.....	35.00	.....	35.00	.....	35.00	.....	655
Bonanza Dev.	10	300,000	.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.75	.....	450
Boston, q.	10	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
British Columbia	5	250,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Cal. & Hecla, c.	25	100,000	.....	.....	570.	560.	570.	.....	570.	.....	.....	.....	.....	.....	33
Centennial, c.	25	90,000	19.25	19.00	19.75	.....	.....	.....	19.25	.....	19.25	19.13	.....	.....	654
Central Oil.	25	60,050	8.00	.....	8.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	60
Cochiti, g.	10	182,250	.....	.....	.....	.....	.....	.....	.39	.....	.....	.....	.....	.....	200
Cons. Mercur, g.	5	1,000,000	1.93	.....	.....	.....	2.00	1.93	1.96	.....	1.96	1.88	.....	.....	2,375
Con. Zinc & L. M. S.	10	110,000	.....	.....	4.00	.....	.....	.....	.....	.....	.....	.....	3.50	.....	350
Copper Range, Con.	100	285,000	58.00	57.00	57.75	57.13	57.63	.....	57.75	57.25	58.50	57.25	58.50	58.00	2,092
Daly-West.	20	150,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Dominion Coal.	100	150,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	140.	.....	100
Dominion Coal, pf.	100	30,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Dominion I & S.	100	100,000	55.50	54.88	55.00	54.38	54.50	53.13	53.38	53 13	.....	.....	56 50	54.00	1,245
Elm River, c.	12	100,000	.....	.....	.....	.....	.....	.....	.....	.....	3.25	.....	3 50	3.00	288
Franklin, c.	25	100,000	11.00	.....	11.50	.....	11.50	.....	.....	.....	11.75	11.50	11.50	.....	170
Guanajuato Cons.	5	385,000	3.75	3.50	.....	.....	3.75	3.50	3.63	.....	3.75	3.50	3.50	.....	735
Humboldt, c.	25	40,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
I. Royale Con., c.	25	150,000	13.00	12.00	.....	.....	12.00	.....	12.00	.....	.....	.....	.....	.....	185
Mass. Con., c.	25	100,000	19.50	.....	19.75	19.00	20.00	19.75	19.95	19.63	20.00	19.75	20.00	19.63	2,320
Mayflower, c.	25	100,000	.....	.....	2.38	.....	.....	.....	.....	.....	.....	.....	2.50	2.38	70
Michigan, c.	25	100,000	.....	.....	.....	.....	11.75	.....	11.50	.....	12.00	.....	.....	.....	160
Mohawk, c.	25	100,000	43.00	42.00	41.00	40.88	.....	.....	.....	.....	42.50	42.00	43.00	42.25	1,010
Mont. C. & C.	25	200,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.00	.....	100
Mont'l & Boston	5	570,000	2.75	2.13	2.63	2.38	2.50	2.38	2.38	2.00	2.50	2.25	2.38	2.25	2,655
National.	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
N. E. Gas & Coke.	25	100,000	4.00	.....	4 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	165
New Idria	5	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Old Colony, c	25	100,000	3.00	.....	.....	.....	.....	.....	2.50	.....	.....	.....	.....	.....	80
Old Dominion, c.	25	150,000	21.38	21.00	.....	.....	20.25	20.00	20.00	.....	20.00	.....	21.50	20.00	1,180
Osceola, c.	25	96,150	63.00	61.50	.....	.....	.....	.....	61.50	61.25	61.50	61.00	62.00	61.00	513
Parrot, s. c.	10	229,850	30.50	29.00	.....	.....	28.00	.....	28.00	.....	.....	.....	28.50	.....	260
Phoenix Con., c.	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	4.63	.....	4.75	4.50	170
Quincy, c.	25	100,000	130.	.....	130.	.....	.....	.....	.....	.....	.....	.....	.....	.....	22
Rhode Island, c.	25	100,000	2.00	.....	2.25	.....	2.00	.....	.....	.....	2.00	.....	2.00	.....	435
Santa Fe, g. c.	10	250,000	2.13	188.	.....	.....	1.88	.....	1.88	.....	.....	.....	.....	.....	2,840
Santa Ysabel	5	130,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Shannon	10	186,296	15 25	15.00	15.00	.....	15.00	.....	15.88	15.50	15.75	.....	15.50	.....	1,220
Tamarack, c.	25	60,000	175	.....	.....	.....	1.80	.....	.....	.....	.....	.....	.....	.....	7
Tecumseh, c.	25	80,000	.....	.....	.....	.....	.....	.....	2.00	.....	2.00	.....	.....	.....	210
Tennessee	25	175,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Trimountain, c.	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Trinity, c.	25	160,000	12.88	12.50	12.75	12.50	.....	.....	12.50	.....	12.75	12.50	12.50	.....	285
United States, g.	25	250,000	20.50	20.25	20.50	20.25	.....	.....	20.75	20.25	20.25	20.13	20 50	20 25	1,735
U. S. Oil.	25	100,000	16.50	.....	16.50	.....	.....	.....	16.50	15.88	16.13	.....	16.25	16.00	710
Utah Con., g.	5	300,000	21.00	.....	.....	.....	.....	.....	22.00	.....	22.00	21.50	22.00	.....	1,050
Victoria, g.	25	100,000	4.50	4.38	.....	.....	4.25	.....	5.25	4.25	4.06	4.00	4.13	4.00	663
Washington, c.	25	60,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Winona, c.	25	100,000	3.63	3.50	3.63	.....	.....	.....	4.00	3.50	4.00	.....	4.00	.....	694
Wolverine, c.	25	60,000	55.25	55.00	56.00	55.25	.....	.....	.....	.....	55.00	.....	.....	.....	131
Wyandot, c.	25	100 000	.....	.....	.....	.....	.....	.....	1.25	.....	.....	.....	1.25	.....	100

Official Quotations Boston Stock Exchange. Total sales, 40,039 shares. †Ex-dividend.

ST. LOUIS, MO.* June 9.

Name.	Shares.	Par	Bid.	Ask.	Name.	Shares.	Par	Bid.	Ask.
Adams.	1,500,000	$10	$0 25	$0.50	Columbia Lead, Mo.	50,000	$10	$12.00	$13.00
Am.-Nettie, Colo.	300,000	10	.90	1.00	Con. Coal, Ill.	50,000	100	19.00	20.00
Catherine Lead, Mo.	50,000	10	3.00	4.00	Doe Run Lead Co.	10,000	100	128.00	132.00
Central C. & C.	3,250,000	100	60.50	61.50	Granite Bimet, Mt.	1,000,000	10	2.43	2.57
Central C. & C., pf.	3,750,000	100	83.00	88 00	St. Joe Lead, Mo.	300,000	10	17.00	18.00
Central Lead, Mo.	10,000	100	130.00	135.00	.....	.....	.....	.....	.....

*From our Special Correspondent.

SPOKANE, WASH.* June 6.

Name of Company.	Par Val.	H.	L.	Sales.	Name of Company.	Par Val.	H.	L.	Sales.
American Boy	$1	.06¾	.06¼	10,200	Princess Maud	$1	.03	.02⅜	15,000
Black Tail	1	.13	.12½	7,500	Quilp	1	35	.34	.....
Ben Hur	1	.13	.12¼	.....	Rambler Cariboo	1	.84	.82	500
Fisher Maiden	1	.06¾	.06½	.....	Republic	1	.10¾	.09¾	10,000
Gold Ledge	0.05	.01¾	.01⅝	.....	San Poil	1	.22½	.22	.....
Lone Pine-Surp. Con.	1	.06⅛	.05¾	7,000	Sullivan	1	.08	.07¼	.....
Morning Glory	1	.03	.02¾	.....	Tom Thumb	1	.22¼	.20¼	3,000
Mountain Lion	0.10	.25	.24	.....	Trade Dollar	1	12	.11	.....

Total sales 53,200 shares. *Reported by Hunner & Harris.

SALT LAKE CITY.* June 7.

Name of Company.	Location.	Shares.	Par Val.	Quotations. High.	Quotations. Low.	Sales.
Ajax	Tintic	300,000	$10	$0.36	$0.32¼	6,600
Anchor	Park City	150,000	10	.....	.....	.....
Bullion Beck	Tintic	100,000	10	.....	.....	.....
Carisa.	Tintic	500,000	1	.31	.25	15,000
Con. Mercur	Mercur	1,000,000	5	1.90	1.87	1,900
Creole	Park City	150,000	1	.....	.....	.....
Daly	Park City	150,000	20	1.90	1.90	110
Daly Judge	.....	.....	.....	2.00	.....	100
Daly-West	Park City	150,000	20	45.00	44.50	581
Dexter	Tuscarora	200,000	5	.....	.....	.....
Eagle & B. Bell	Tintic	250,000	1	.....	.....	.....
Grand Central	Tintic	250,000	1	.....	.....	.....
Horn Silver	Frisco	400,000	25	.....	.....	.....
L. Mammoth	Tintic	150,000	1	1.22½	1.16	4,700
Mammoth	Tintic	400,000	25	1.19⅜	1.14	2,950
May Day	Tintic	400,000	.25	.22¼	.20¼	41,000
Ontario	Park City	150,000	100	8.00	8.00	300
Sacramento	Mercur	1,000,000	5	.28	.23	6,100
Silver King	Park City	150,000	20	.....	.....	.....
Star Con.	Tintic	500,000	1	.22	.20¾	1,300
Swansea	Tintic	100,000	5	.....	.....	.....
So. Swansea	Tintic	300,000	1	.35	.33½	3,200
Showers Con.	Tintic	400,000	5	.05	.05	4,000
Sunshine	Mercur	250,000	10	.27	.26	2,300
Tetro	Tintic	500,000	5	.24	.20	20,500
U. Sunbeam	Tintic	150,000	1	.25	.25	600
Uncle Sam	Tintic	500,000	1	.32	.30	15,400
West Mng. Glory	Tintic	500,000	.10	.02	.02	4,000
Victor	Tintic	500,000	1	.24	.21¾	17,450
Yankee Con.	Tintic	500,000	1	1.27	1.09	7,150
Ben Butler	Bingham	500,000	1	.09⅞	.08⅞	8,800
Boss Tweed	Tintic	250,000	1	.25	.25	100
California	Park City	300,000	1	.13	.11⅝	42,300
Century	Park Valley	150,000	1	.54¼	.24½	29,100

*By our Special Correspondent. Total number of shares sold, 231,511.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Name of Company.	par val	June 2. H.	June 2. L.	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 7. H.	June 7. L.	Sales
Acacia	$1	.10	.09½	.10	.09½	.10	.09½	.10	.09½	.10	.09¼	.10	.09¼	6,000
Alamo	1	.03⅜	.03	.03⅜	.03¼	.03⅜	.03⅜	.03⅜	.03¼	.03⅜	.03¼	.03⅜	.03¼	....
Am. Con	1	.02¼	.02⅛	.02⅜	.02⅛	.02⅜	.02⅛	.02⅜	.02¼	.02⅛	.02¼	.02⅜	.02⅛	10,000
Anaconda	1	.20	.....	.17½	.....	.18	.....	.18	.....	.....	.....	.....	.....	5,500
Argentum Jr	1	.02⅜	.....	.02¾	.....	.02	.....	.02	.....	.02	.....	.02	.....	.....
Battle Mt. C.	1	.15	.....	.15	.....	.15	.....	.13¾	.....	.15	.....	.15	.....	500
Ben Hur	1	.03	.....	.03	.....	.03	.....	.03	.....	.03	.....	.03	.....	.....
Blue Bell	1	.07	.....	.07	.....	.07	.....	.07	.....	.....	.....	.09	.07	.....
Buckhorn	1	.02	.01⅛	.02	.01½	.01½	.....	.01⅛	.....	.02	.....	.01½	.....	.....
But'fly Ter	1	.18	.15	.18	.15	.18	.15	.18	.15	.18	.15	.18	.15	.....
C. K. & N	1	.06⅜	.06⅜	.06½	.05⅞	.06¼	.05⅝	.06⅛	.06⅛	.06⅜	.05⅞	.06⅛	.06⅜	5,000
Columbine-Victor	1	.08	.07	.07	.....	.07¼	.....	.07¼	.....	.07⅛	.06	.07¼	.....	.....
C. C. G. Ext	1	.04¾	.....	.04¾	.....	.04⅞	.04¾	.04¾	.....	.05	.08½	.05	.04¾	.....
C. C. & Mn	1	.02¾	.....	.02¾	.....	.02¾	.....	.02¾	.....	.04	.02¾	.02¾	.....	.....
Cr'de & C. C	1	.04	.03½	.04	.....	.04	.03½	.04	.03	.04	.....	.04	.....	.....
C. C. Con	1	.07	.06¾	.06½	.06½	.06¾	.06¼	.07	.06⅛	.07	.06¼	.06⅝	.06	1,000
Dante	1	.03½	.03¾	.03¾	.03¼	.04	.03⅜	.03¾	.03⅜	.03¾	.03½	.03¾	.03¼	2,000
Dr. Jack Pot	1	.17½	.17¼	.15½	.15	.14½	.13½	.14½	.14¼	.14	.13⅜	.13¾	.13¼	57,700
Elkton, Con	1	.63¼	.63	.63½	.65	.65½	.63½	.65	.64¾	.63¼	.62¾	.63¼	.62¼	19,700
El Paso, G	1	.52¼	.51¾	.54	.53½	.53⅛	.53⅛	.53⅝	.53	.55	.54	.55	.54	22,600
Fanny Rawlings	1	.04½	.04	.05	.04	.05	.04	.04⅞	.04¼	.04¾	.04½	.04¼	.04¼	15,000
Findley	1	.08¾	.08	.08⅜	.08	.08	.....	.08	.....	.09	.07⅝	.08	.06	8,000
Gold Dollar Con	1	.05¾	.05¼	.06	.05½	.05¾	.05	.05½	.05⅜	.05½	.05¼	.05¾	.05½	42,050
Gold Cycle	1	.63¼	.62¼	.63½	.62½	.66	.62¼	.62	.....	.62	.....	.63½	.62	1,000
Gold Fleece	1	.25	.....	.25	.....	.21⅞	.15	.25	.15	.25	.10	.19	.17	2,100
Gold Knob	1	.61½	.60	.62	.....	.62	.....	.....	.....	.....	.....	.....	.....	.....
Gold Sov'n	1	.02⅜	.....	.03	.....	.02¾	.....	.02⅜	.....	.02¾	.....	.02½	.02⅜	4,000
Hart	1	.04	.....	.04	.....	.04	.....	.04	.....	.04	.....	.04	.....	.....
Ida May	½	.....	.....	.....	.....	.12½	.....	.....	.....	.....	.....	.....	.....	.....
Ironclad	1	.....	.....	.....	.....	.....	.....	.....	.....	.03½	.02¾	.03½	.02¾	.....
Isabella	1	.29½	.29¼	.30½	.29⅝	.30¾	.30	.29¼	.29	.28⅜	.28¼	.29¾	.28¼	28,600
Jack Pot	1	.15⅜	.14½	.....	.....	.11	.....	.15	.....	.15	.....	.14	.....	2,500
Last Dollar	1	.40	.....	.40	.....	.40	.....	.41	.....	.40	.....	.60	.45	.....
Lexington	1	.05¾	.05⅜	.05⅜	.05½	.05¾	.05⅜	.05¾	.....	.05¾	.05¼	.05⅝	.05⅜	10,500
Little Nell	1	.03	.02	.03	.02	.03	.02	.03¼	.02¼	.02¼	.....	.02½	.....	.....
Little Puck	1	.04⅜	.04⅛	.04¼	.04	.04⅛	.04	.04½	.04	.04⅜	.04¼	.04¼	.....	24,000
Matoa	1	.07	.....	.07	.....	.07	.....	.07	.....	.07	.....	.07	.....	.....
Mint	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Missouri	1	.03	.....	.02	.....	.02½	.....	.02	.....	.02¼	.....	.....	.....	.....
Mol. Gibson	1	.14	.11	.15	.14½	.15	.....	.22	.20⅛	.19⅜	.....	.16	.14	15,000
Morn'g Star	1	.02¾	.02⅝	.02⅜	.02⅛	.02⅜	.02⅛	.02⅜	.02⅛	.02⅜	.02⅛	.02⅝	.02⅜	.....
National	1	.02	.01½	.02	.....	.02⅛	.01⅝	.02	.01¼	.02	.01⅝	.02	.01⅜	18,000
Nellie, V	1	.02	.01½	.02	.01⅜	.02⅛	.01¼	.02	.01⅜	.02⅛	.01⅝	.02	.01¾	2,000
New Haven	1	.03½	.04¼	.04½	.03⅞	.04½	.03⅝	.03⅜	.03⅛	.03⅜	.03⅛	.03¾	.03¼	10,000
Oriole	1	.01½	.....	.02	.....	.01½	.....	.02	.....	.....	.....	.02⅛	.....	.....
Pappoose	1	.01⅝	.01⅜	.02	.....	.01⅝	.....	.02⅛	.....	.....	.....	.02⅛	.....	19,000
Pharmacist	1	.04½	.03⅞	.03⅝	.03½	.04¼	.03¾	.04¼	.03¾	.04⅛	.03⅞	.03⅞	.03⅝	5,000
Pinnacle	1	.07½	.06½	.07¼	.06½	.07¼	.06½	.07¼	.06¼	.07¼	.06¼	.07¼	.06¼	8,300
Portland	1	1.80	1.75	1.75	1.00	1.79	1.75	1.80	1.75½	1.80	1.73	1.80	1.75½	900
Prince Alb	1	.02⅜	.02⅛	.02¼	.02½	.02¾	.02	.02¼	.02⅛	.02⅞	.02⅝	.02¼	.02	1,000
Princess	1	.01¼	.....	.01¼	.....	.01¼	.....	.01¼	.....	.01¼	.....	.02	.01¼	.....
Progress	1	.04	.03½	.03¾	.03	.04	.....	.04	.03	.03½	.....	.03½	.03	1,000
Pythias	1	.02	.01½	.02	.01½	.02	.....	.02	.01½	.02	.....	.02	.....	.....
Rob. Burns	1	.01¾	.....	.01¾	.....	.02	.....	.01¾	.....	.02	.....	.....	.....	.....
Rose Maud	1	.02⅜	.02	.02⅜	.02	.02⅜	.02	.02¼	.02	.02	.....	.05	.03¼	3,000
Rose Nicol	1	.03¼	.03¼	.05	.03	.03	.....	.03¼	.....	.05	.03¼	.....	.....	.....
Sunset Eclipse	1	.03½	.03½	.03½	.03⅜	.03⅝	.03¼	.03⅜	.03⅛	.03⅜	.03⅛	.03¼	.03	18,300
Uncle Sam	1	.....	.....	.02¼	.01¾	.02¼	.01¾	.....	.....	.02	.01½	.02	.01½	1,000
Union	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Vindicator	1	.93½	.90	.93	.90	.93½	.90	.93½	.90	.93⅛	.90	.93½	.90	500
Work	1	.06¼	.05¾	.....	.....	.06	.05	.06	.05	.06	.05¾	.06	.05¼	5,000

Total sales 380,050 shares.

Colorado Springs (*By Telegraph.*)

Name of Company.	par val	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 7. H.	June 7. L.	June 9. H.	June 9. L.	June 10. H.	June 10. L.	June 11. H.	June 11. L.
Acacia	$1	.10	.09½	.10	.09¼	.10	.09¼	.09½	.09	.09½	.09	.10	.09
Alamo	1	.03⅜	.03¼	.03⅜	.03¼	.03⅜	.03¼	.03⅜	.03¼	.03⅜	.03¼	.03⅜	.03¼
American Con	1	.02⅜	.02¼	.02½	.02¼	.02¾	.02⅜	.02¼	.02	.02¼	.02	.02¼	.02
Anaconda	1	.18	.17	.18	.16½	.18	.16	.17	.16	.17	.15	.17	.15
Battle Mt	1	.13⅞	.13½	.15	.14	.15	.14	.15	.12	.15	.13	.14	.12
Butterfly Ter	1	.18	.15	.18	.15	.18	.15	.18	.15	.18	.14	.15	.13
Columbia V	1	.07¼	.06¾	.07⅛	.06	.07¼	.06½	.07¼	.06¼	.07¼	.06	.07¼	.06
Cripple Creek Con	1	.07	.06⅞	.07	.06¾	.06⅞	.06	.06⅞	.06	.07	.06¼	.07	.06¼
Dr. Jack Pot	1	.14½	.14¼	.14	.12½	.13⅜	.13¼	.13⅝	.13	.13¾	.13⅛	.13¾	.13½
El Paso	1	.53½	.53	.55	.54	.55	.54	.54¾	.54¼	.54⅞	.54¾	.54⅝	.54
Elkton, Con	1	.65	.63¾	.63¾	.62¾	.63¼	.60¼	.63	.62½	.63½	.63	.63¾	.62
Fanny Rawlings	1	.04⅞	.04½	.04½	.04¼	.04½	.04¼	.04⅝	.04¼	.05	.04⅞	.05	.04¼
Findlay	1	.08	.07¾	.09	.07⅛	.08	.06	.06	.07	.08	.06	.08	.07
Gold Dollar Cons	1	.05½	.05⅜	.05½	.05⅛	.05⅜	.05⅛	.05¾	.05½	.05½	.04⅞	.05¼	.05
Gold Sov'n	1	.02⅞	.02⅝	.02¾	.02⅛	.02⅝	.02½	.02¾	.02½	.02⅝	.02½	.02¾	.02½
Golden Cycle	1	.63	.62	.63	.62	.63½	.62	.63	.62	.60¼	.59	.61	.60
Golden Fleece	1	.25	.14	.25	.19	.19	.17	.20	.10	.17	.19	.18	.10
Gould	1	.07	.05½	.07½	.05	.07	.05	.08	.06	.08	.06	.08	.06
Isabella	1	.29¼	.29	.28½	.28¼	.29¾	.28¾	.27¾	.27½	.26¾	.26¼	.26¾	.26
Jack Pot	1	.15	.13	.15	.10	.14	.08½	.15	.10	.15½	.10	.12	.10
Keystone	1	.04	.03½	.04	.03½	.04	.03½	.04	.03½	.04	.03	.04	.03
Last Dollar	1	.60	.41	.60	.40	.60	.45	.60	.40	.60	.40	.60	.40
Lexington	1	.05¾	.05½	.05¾	.05¼	.05⅝	.05⅜	.05½	.05¼	.05⅝	.05½	.05¼	.05⅜
Mollie Gibson	1	.22	.20¼	.19¾	.19	.16	.14	.14½	.11	.16	.15	.13	.12½
Moon Anchor	1	.13	.12½	.13½	.12¼	.13½	.12⅛	.13½	.12½	.13½	.12½	.13½	.12½
New Haven	1	.03⅞	.03⅜	.03⅞	.03½	.03¾	.03¼	.03¾	.03⅛	.03¾	.03¼	.03⅞	.03¼
Pharmacist	1	.04¼	.03¾	.04½	.03¾	.04½	.03⅞	.04	.03⅞	.04	.03¾	.04½	.03¾
Pinnacle	1	.08	.....	.07½	.06½	.07¼	.06½	.07¼	.06¼	.07⅜	.06¼	.06⅞	.06¼
Portland	1	1.80	1.75½	1.80	1.75⅝	1.80	1.75⅝	1.80	1.75⅝	1.85	1.76	1.85	1.75
Sunset Eclipse	1	.03½	.03¼	.03½	.03⅜	.03¼	.03	.....	.....	.03¼	.03	.03⅜	.02¾
Vindicator, Con	1	.93¾	.90	.93½	.90	.93⅜	.90	.94	.90	.95	.90	.95	.90
Work	1	.06	.05	.06	.05¼	.06	.05¼	.06	.05¼	.06½	.05⅝	.06½	.05

MONTREAL, CANADA.

June 9.

Name of Company.	par val	H.	L.	Sales	Nome of Company.	par val	H.	L.	Sales
Big Three	$1	.01¼	.....	.....	Montreal-London	$0.24	.02½	.....	.....
California	1	.04½	.04	.....	Noble Five	1	.....	.....	.....
Can. Gold Fields	0.10	.....	.....	.....	Novelty	1	.....	.....	.....
Deer Trail Con	1	.03½	.02¼	.....	North Star	....	.25	.....	500
Evening Star	1	.04	.02	.....	Payne	1	.22½	.22	1,500
Golden Star	1	.04¼	.03	.....	Rambler-Cariboo	1	.....	.....	.....
Gold Hills Dev	1	.01⅜	.....	.....	Republic Con	1	.10	.....	.....
Knob Hill	1	.....	.....	.....	Slocan-Sovereign	1	.02¼	.....	.....
Monte Christo	1	.02	.....	.....	Virtue	1	.11	.....	1,500
Montreal, G. F	1	.02½	.....	.....	War Eagle	1	.14	.....	1,000

LONDON.

May 31.

Name and Country of Company	Author-ized Capital.	Par value.	Last dividend. Amt.	Last dividend. Date	Quotations. Buyers.	Quotations. Sellers.
	£	£. s. d.	s. d.		£. s. d.	£. s. d.
Anaconda, c. s., Montana	6,000,000	5 0 0	2 0	May, 1902	5 18 9	6 1 3
Copiapo, c., Chile	225,000	2 0 0	2 6	Dec., 1901	2 5 0	2 10 0
*De Lamar, g. s., Idaho	80,000	1 0 0	3 0	May, 1902	15 0	1 0 0
Enterprise, g., British Col	200,000	1 0 0			7 6	12 6
Frontino & Bolivia, g., Colombia	140,000	1 0 0	3 0	July, 1901	1 0 0	1 2 6
Hall Mg. & Sm., c. s., British Col	325,000	1 0 0			1 6	2 6
Le Roi, g., British Col	1,000,000	5 0 0	5 0	Nov., 1899	1 12 6	1 17 6
*Le Roi No. 2, g., British Col	120,000	5 0 0	5 0	May, 1902	3 17 6	4 2 6
Montana, g. s., Montana	660,000	1 0 0	6	April, 1899	4 0	4 6
Mountain Copper, California	1,250,000	5 0 0	5 0	April, 1901	4 7 6	4 12 6
Stratton's Independence, Colorado	1,100,000	1 0 0	6d	April, 1902	6 6	7 6
St. John del Rev., g., Brazil	600,000	1 0 0	6	June, 1902	17 0	18 0
Utah Con., g., (High. Boy), Utah	300,000	1 0 0	5 0	Dec., 1901	4 10 0	5 0 0
Ymir, g., British Col	200,000	1 0 0	1 0	Mar., 1902	12 6	17 6
European:						
Linares, l., Spain	45,000	3 0 0	7 0	March, 1901	3 0 0	4 0 0
Mason & Barry, c., sul., Port'g'l	185,145	1 0 0	13 0	May, 1902	3 7 6	3 12 6
*Rio Tinto, c., Spain	1,625,000	5 0 0	37 6	May, 1902	45 12 6	45 17 6
*Rio Tinto, pref., Spain	1,625,000	5 0 0	2 6	May, 1902	5 17 6	6 2 6
*Tharsis, c., Spain	1,250,000	2 0 0	12 0	May, 1902	4 17 6	5 2 6
Australia and New Zealand:						
Assoc. Gold Mines, W Australia	500,000	1 0 0	1 6	Jan., 1900	1 3 9	1 6 3
Br'ken Hill Pr'p., s., N. S. Wales	384,000	8 0	1 0	Nov., 1901	1 12 0	1 13 0
Great Bo'd'r Pr'p., W. Australia	175,000	2 0	6	June, 1902	18 6	1 0 0
Hannan's Brownhill, g., W. Australia	155,000	1 0 0	5 0	Aug., 1901	2 7 6	2 10 0
Ivanhoe Gold Corp. W. Australia	1,000,000	5 0 0	3 0	Jan., 1902	7 0 0	7 2 6
Kalgurlie, g., W. Australia	120,000	1 0 0	rts.	Oct., 1899	3 1 3	3 3 9
Lake View Cons., g., W. Australia	250,000	1 0 0	5 0	Oct., 1901	3 0 0	3 2 6
Mt. Lyell M. & R. L., c., Tasmania	725,000	3 0 0	1 6	April, 1902	2 17 6	3 0 0
Mt. Morgan, g., Queensland	1,000,000	1 0 0	3	May, 1902	3 8 9	3 11 3
Waihi, g., New Zealand	320,000	1 0 0	2 6	Mar., 1902	5 15 0	5 17 6
Indian:						
†Champion Reef, g., Colar Fields	220,000	10 0	3 6	May, 1902	5 11 3	5 13 9
Mysore Gold, Colar Fields	250,000	10 0	5 0	Mar., 1902	6 16 3	6 18 9
Nundydroog, g., Colar Fields	242,000	10 0	1 3	Mar., 1902	1 17 6	2 0 0
Ooregum, g., Colar Fields	290,000	10 0	1 9	May, 1902	2 2 6	2 5 0
Ooregum, pref., g., Colar Fields	240,000	10 0	1 9	May, 1902	2 16 3	2 18 9
African:						
British S. Africa, chartered S. Africa	5,000,000	1 0 0	rts.	May, 1899	4 1 3	4 2 6
Cape Copper, S. Africa	600,000	2 0 0	8 0	Jan., 1902	3 10 0	3 15 0
Cape Copper, pref., S. Africa	150,000	2 0 0	8 0	Jan., 1902	3 10 0	3 15 0
City and Sub'n (New), g., Transvaal	1,360,000	4 0 0	3 0	Aug., 1899	7 10 0	7 12 6
*Crown Reef, g., Transvaal	120,000	1 0 0	10 0	May, 1902	17 10 0	18 0 0
De Beers Con., d., pref., Cape Colony	1,975,600	2 10 0			19 11 3	19 13 9
De Beers Con., def	2,100,000	2 10 0			23 2 6	23 5 0
Ferreria g., Transvaal	90,000	1 0 0	10 0	Jan., 1902	25 0 0	25 10 0
Geldenhuis Est., g. Transvaal	200,000	1 0 0	10 0	June, 1899	7 8 9	7 11 3
Henry Nourse, g., Transvaal	125,000	1 0 0	10 0	June, 1899	9 17 6	10 2 6
Jagersfontein, d., Orange F. S.	1,000,000	5 0 0	6 0	Dec., 1900	26 15 0	27 5 0
Joh'n'b'g Con. Invet., S. Africa	2,750,000	1 0 0	2 0	Nov., 1899	3 18 9	4 0 0
Jubilee, g., Transvaal	50,000	1 0 0	5 0	July, 1899	7 2 6	7 7 6
Langlaagte Est., g., Transvaal	470,000	1 0 0	3 0	Aug., 1899	4 13 9	4 16 3
May Con., g., Transvaal	290,000	1 0 0	3 0	Dec., 1901	5 1 3	5 3 9
Meyer & Charlton, g., Transvaal	100,000	1 0 0	3 0	Jan., 1902	6 5 0	6 7 6
Namaqua, c., Cape Colony	200,000	2 0 0	3 0	Feb., 1902	3 5 0	3 10 0
Primrose (New), g., Transvaal	300,000	1 0 0	6 0	June, 1899	4 17 6	5 0 0
Rand Mines, g., S. Africa	448,989		15 0	June, 1899	12 18 9	13 1 3
Robinson, g., Transvaal	2,750,000	5 0 0	10 0	Dec., 1901	11 16 3	11 18 9
Sheba, g., Transvaal	1,100,000	1 0 0	5 0	Feb., 1902	1 10 0	1 11 3
Wolhuter, g., Transvaal	860,000	4 0 0	2 0	Jan., 1899	6 0 0	6 2 6

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver. *Ex-dividend.

PARIS.

May 22.

Name of Company.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Opening	Prices. Closing
			Francs.	Fr.	Fr.	Fr.	Fr.
Acieries de Creusot	France	Steel mfrs	27,000,000	2,000	85.00	1,760.00	1,778.00
" " Firminy	"	" "	3,000,000	500	200.00	2,500.00	2,510.00
" " Huta-Bank	Russia	Iron and Steel		500		3,120.00	3,095.00
" " la Marine	France	Steel mfrs	20,000,000	500	65.00	1,380.00	1,390.00
Anzin	"	Coal			320.00	5,305.00	5,255.00
Boleo	Lower Cal	Copper		500	176.00	1,275.00	1,380.00
Briansk	Russia	Coal and Iron		500		356.00	362.00
Champ d'Or	S. Africa	Gold	3,375,000	25	3.75	33.75	36.00
Courrieres	France	Coal	600,000	300	90.00	2,380.00	2,385.00
Dombrowa	Russia	"		500	75.00	970.00	960.00
Dourges	France	"	12,000,000	500	1,000	24,700.00	24,700.00
Dynamite Centrale	"	Explosives		500	19.00	664.00	580.00
Escombrera-Bleyberg	Spain	Lead		500	50.00	800.00	754.00
Fraser River	Brit. Col'mb	Gold	250,000	25		6.50	6.50
Huanchaca	Bolivia	Silver	40,000,000	125	5.00	101.00	107.50
Laurium	Greece	Zinc and Lead	16,300,000	500	25.00	340.00	345.00
Malfidano	Italy	Zinc	12,500,000	500	12.50	330.00	320.00
Metaux, Cie. Fran. de	France	Metal dealers	25,000,000	500	22.50	475.00	471.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	35.00	860.00	880.00
Napthe Baku	Russia	Petroleum				442.50	447.50
Napthe Nobel	"	"				540.00	540.00
" " parts	"	"				10,425.00	10,500.00
Nickel	N. Caled'nia	Nickel	10,000,000	250	20.00	485.00	475.00
Penarroya	Spain	Coal, etc		500	55.00	1,037.00	1,049.00
Rebecca	Colo'do, U. S.	Gold	5,000,000	25		2.00	1.50
Salines de l'Est	France	Salt		500	6.00	283.00	273.00
Salines du Midi	"	"		500	40.00	910.00	909.50
Vielle Montagne	Belgium	Zinc	9,000,000	30	30.00	545.00	555.00

TORONTO, ONT.

Name of Company.	par val	June 3. H.	June 3. L.	June 4. H.	June 4. L.	June 5. H.	June 5. L.	June 6. H.	June 6. L.	June 7. H.	June 7. L.	June 9. H.	June 9. L.	Sales
Ontario:														
Olive	1	.06	.04¼	.06	.04	.06	.04	.06	.04	.06	.04⅜	.06	.04¼	.....
British Columbia:														
Cariboo McK	1	.23	.18	.23	.18	.23	.19	.23	.19	.23	.19	.23	.18	.....
Center Star	1	.42	.38½	.41	.38	.41	.38	.40½	.37½	.40	.37	.40½	.37	.....
Fairview	1	.08	.06½	.08	.06½	.08	.06½	.07½	.06½	.07½	.06½	.07½	.06½	.....
Lone Pine	1	.07½	.05	.07½	.05	.07½	.05	.07½	.05½	.07½	.05	.07½	.05	.....
Morrison	1	.06	.....	.06	.....	.06	.....	.05	.....	.05	.....	.06	.....	.....
Mt. Lion	1	.26	.18	.25	.20	.26	.20	.25	.20	.25	.18	.25	.20	.....
North Star	1	.26	.23½	.26	.22½	.25	.22	.24½	.22½	† 24½	.22	.25	.22	4,500
Payne	1	.25	.22½	.24	.22½	.25	.22	.24½	.22½	.25	.22½	.25	.22	23,500
Rambler	1	.85	.78	.85	.80	.85	.75	.85	.75	.85	.75	.85	.75	.....
Republic	1	.10⅛	.09½	.10½	.09½	.10¼	.09½	.10¼	.09¼	.10½	.09	.10¼	.09¼	.....
Virtue	1	.18	.12	.17	.12	.15	.11	.14	.11	.15	.10	.15	.10	.....
War Eagle Cons	1	.17	.14	.16	.13	.16	.13½	.15½	.12½	.15	.13	.15	.13	.....
White Bear	1	.03⅝	.03	.03¾	.03	.03¼	.03	.03½	.03	.03¼	.03	.03¼	.03	8,000
Winnipeg	1	.05	.04	.05	.04	.05	.03¾	.05	.03¾	.05	.03¾	.05	.04	.....
Wonderful	1	.03½	.....	.03½	.....	.03½	.....	.03½	.....	.03½	.....	.03½	.....	.....
Develop. Co														
Can. G. F. S	1	.04¾	.04	.04¾	.04	.04½	.04	.04	.04	.04½	.04	.04½	.03¾	.....

Total sales, 36,000 shares. †Ex-dividend.

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES.

Abrasives—	Cust.	Meas.	Price.
Carborundum, f.o.b. Niagara Falls, Powd., F. FF. FFF..	lb.		$0.08
Grains	"		.10
Corundum, N. C	"		.07@.10
Chester, Mass	"		.04½@.05
Barry's Bay, Ont			.07½@.09½
Crushed Steel, f. o. b. Pittsburg	"		.05½
Emery, Turkish flour, in kegs.	"		.03½
Grains, in kegs	"		.05@.05½
Naxos flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Chester flour, in kegs	"		.03½
Grains, in kegs	"		.05@.05½
Peekskill, f.o.b. Easton, Pa., flour, in kegs	"		.01½
Grains, in kegs	"		.02½
Crude, ex-ship N. Y.: Abbott (Turkey)	lg. ton		26.50@30.00
Kuluk (Turkey)	"		22.00@24.00
Naxos (Greek) h. gr	"		.26.00
Garnet, as per quality	sh. ton		25.00@35.00
Pumice Stone, Am. powd	lb.		.01½@.02
Italian, powdered	"		.01½
Lump, per quality	"		.04@.40
Rottenstone, ground	"		02½@.04½
Lump. per quality	"		.06@.20
Rouge, per quality	"		.10@.30
Steel Emery. f.o.b. Pittsburg..	"		.07
Acids—			
Boracic, crystals	"		.10¾@.11
Powdered	"		.11¼@.11½
Carbonic, liquid gas			.12½
Chromic, crude			.20
Hydrofluoric, 36%	"		.06
48%	"		.05
60%	"		.11
Sulphurous, liquid anhy	"		.05
Alcohol—Grain	gal.		2.41
Refined wood, 95@97%	"		.60@.65
Purified	"		1.20@1.50
Alum—Lump	100 lbs.		1.75
Ground	"		1.80
Powdered	"		3.00
Chrome, com'l	"		2.75@3.00
Aluminum—			
Nitrate	lb.		1.50
Oxide, com'l, common	"		.06½
Best	"		.20
Pure	"		.80
Hydrated	100 lbs.		2.60
Sulphate, pure	"		1.50@2.00
Com'l	"		1.15@1.25
Ammonia—			
Aqua, 16°	lb.		.03
18°	"		.03¼
20°	"		.03¾
26°	"		.05½
Ammonium—			
Carbonate, lump	"		.08¼
Powdered	"		.09
Muriate, grain	"		.05⅝
Lump	"		.08¼
Nitrate, white, pure (99%)	"		.12
Phosphate, com'l	"		.09
Pure	"		.12
Antimony—Glass	"		.30@.40
Needle, lump	"		.05½@.06
Powdered, ordinary	"		.05¾@.07¼
Oxide, com'l white, 95%	"		.09½
Com'l white, 99%	"		.12
Com'l gray	"		.07
Sulphuret com'l	"		.16
Arsenic—White	"		.03@.03¼
Red	"		.06¾@.07
Asphaltum—			
Ventura, Cal	sh. ton		32.00
Cuban	lb.		.01½@.03½
Egyptian, crude	"		.05½@.06
Trinidad, refined	sh. ton		35.00
San Valentino (Italian)	lg. ton		16.00
Seyssel (French), mastic	sh. ton		21.00
Gilsonite, Utah, ordinary	lb.		.03
Select	"		.03¾
Barium—			
Carb. Lump, 80@90%	sh. ton		25.00@27.50
92@98%	"		26.00@29.00
Powdered, 80@90%	lb.		.01¾@.02
Chloride, com'l	100 lbs.		1.67½@1.76
Chem. pure cryst	lb.		05
Nitrate, powdered	"		.05½

Barium -	Cust.	Meas.	Price
Oxide, Am. hyd. cryst	lb.		$0.02¾
Sulphate (Blanc Fixe)	"		.02
Barytes—			
Am. Crude, No. 1	sh. ton		9.00
Crude, No. 2	"		8.00
Crude, No. 3	"		7.75
German, gray	"		14.50
Snow white	"		17.00
Bauxite—Ga. or Ala. mines:			
First grade	lg. ton		5.50
Second grade	"		4.75
Bismuth—Subnitrate	lb.		1.40
Subcarbonate	"		1.65
Bitumen—"B"	"		.03½
"A"	"		.05
Bone Ash	"		.02¼@.02½
Borax	"		.07¼@.07½
Bromine	"		.40
Cadmium—Metallic	"		1.40
Sulphate	100 lbs.		2.00@2.50
Calcium—Acetate, gray	"		1.30
" brown	"		.90
Carbide, ton lots f.o.b. Niagara Falls, N. Y.. or Jersey City, N. J.	sh. ton		75.00
Carbonate, ppt	lb.		.05
Chloride,	sh. ton,		9.00@10.00
Cement—			
Portland, Am., 400 lbs	bbl.		1.70@1.90
Foreign	"		1.65@2.25
"Rosendale," 300 lbs	"		.75
Slag cement, imported	"		1.65
Ceresine—			
Orange and Yellow	lb.		.12
White	"		.13½
Chalk—Lump, bulk	sh. ton		2.50
Ppt. per quality	lb.		.03¾@.06
Chlorine—Liquid	"		.30
Water	"		.10
Chrome Ore—			
(50% ch.) ex-ship N. Y	lg. ton		24.75
Sand. f.o.b. Baltimore	"		33.00
Bricks. f.o.b. Pittsburg	M		175.00
Clay, China—Am. com., ex-dock, N. Y	lg. ton		8.00
Am. best, ex-dock, N. Y	"		9.00
English, common	"		12.00
Best grade	"		17.00
Fire Clay, ordinary	sh. ton		4.25
Best	"		6.00
Slip Clay	"		5.00
Coal Tar Pitch	gal.		.08
Cobalt—Carbonate	lb.		1.75
Nitrate	"		1.50
Oxide—Black	"		2.26@2.30
Gray	"		2.28@2.40
Smalt, blue ordinary	"		.06
Best	"		.20
Copperas	100 lbs.		.30@.35
Copper—Carbonate	lb.		.18@.19
Chloride	"		.25
Nitrate, crystals	"		.35
Oxide, com'l	"		.19
Cryolite	"		.06½
Explosives—			
Blasting powder, A	25 lb. keg		2.65
Blasting powder, B	"		1.40
"Rackarock," A	lb.		.25
"Rackarock," B	"		.18
Judson R.R. powder	"		.10
Dynamite (20% nitro-glycerine)	"		.13
(30% nitro-glycerine)	"		.14
(40% nitro-glycerine	"		.15
(50% nitro-glycerine)	"		.16½
(60% nitro-glycerine)	"		.18
(75% nitro-glycerine)	"		.21
Glycerine for nitro (32 2-10° Be.)			.12⅞@.13
Feldspar—Ground	sh. ton		8.00@9.00
Flint Pebbles—Danish, Best..	lg. ton		14.75
French, Best	"		11.75
Fluorspar—			
Am. lump, 1st grade	sh. ton		$14.40
2d grade	"		13.90
Gravel and crushed, 1st gr..	"		13.40
2d grade	"		12.40
Ground, 1st grade	"		17.90
2d grade	"		16.50
Foreign, lump	"		8.00@12.00
Ground	"		11.50@14.00
Fuller's Earth—Lump	100 lbs.		.75
Powdered	"		.85

Graphite—Am. f.o.b. Providence, R. I., lump	Cust. sh. ton	Meas.	Price $8.00
Pulverized	"		30.00
German, som. pulv	lb.		.01¼@.01½
Best pulverized	"		.01½@.02
Ceylon, common pulv	"		.02¾@.03½
Best pulverized	"		.04@.08
Italian, pulv	"		.01¼
Gypsum—Ground	sh. ton		8.00@8.50
Fertilizer	"		7.00
Rock	lg. ton		4.00
English and French	"		14.00@16.00
Infusiorial Earth—Ground.			
American, best	"		20.00
French	"		37.50
German	"		40.00
Iodine—Crude	100 lbs		2.45
Iron—Muriate	lb.		.05
Nitrate, com'l	"		.01¼
True	"		.08
Oxide, pure copperas col	"		.05@.10
Purple-brown	"		.02
Venetian red	"		.01@.01½
Scale	"		.01@03
Kaolin—(See Clay. China.)			
Kryolith—(See Cryolite.)			
Lead—Acetate, white	"		.07¾@.08
Brown	"		.06
Nitrate, com'l	"		.06½
" gran	"		.08¼
Lime—Com., abt. 250 lbs	bbl.		.80
Finishing	"		.90
Magnesite—Greece.			
Crude (95%)	lg. ton		6.50@7.00
Calcined	sh. ton		14.00@15.00
Bricks	M		170.00
Am. Bricks, f.o.b. Pittsburg	"		175.00
Magnesium—			
Carbonate, light, fine pd	lb.		.05
Blocks	"		.07@.09
Chloride, com'l	"		.01¾
Fused	"		.20
Nitrate	"		.60
Sulphate	100 lbs.		.75@.95
Manganese—Powdered, 70@75% binoxide	lb.		.01¼@.01½
Crude, pow'd. 75@85% binoxide	"		.01½@.02¼
85@90% binoxide	"		.02¼@.03¼
90@95% binoxide	"		.03¼@.05½
Carbonate	"		.16@.20
Chloride	"		.04
Ore, 50%, Foreign	unit		.20@.21
Domestic	"		.30
Marble—Flour	sh. ton		6.00@7.00
Mercury—Bichloride	lb.		.77
Mica—N. Y. gr'nd, coarse	"		.03@.04
Fine	"		.04@.05
Sheets, N. C., 2x4 in	"		.30
3x3 in	"		.80
3x4 in	"		1.50
4x4 in	"		2.00
6x6 in	"		3.00
Mineral Wool—			
Slag, ordinary	sh. ton		19.00
Selected	"		25.00
Rock, ordinary	"		32.00
Selected	"		40.00
Nickel—Oxide, No. 1	lb.		1.00
No. 2	"		.60
Sulphate	"		.20@.21
Oils—Black, reduced 29 gr.:			
25@30, cold test	gal.		.09¾@.10¼
15, cold test	"		.10¾@.11¼
Zero	"		.11¾@.12¾
Summer	"		.09¼@.09¾
Cylinder, dark steam ref	"		.08¾@.10¾
Dark, filtered	"		.11¼@.15¾
Light filtered	"		.14¾@.17¾
Extra cold test	"		.21¾@.26¾
Gasoline, 86°@90°	"		.14@.19
Naphtha, crude, 68°@72°	bbl.		9.05
"Stove"	gal.		.12
Linseed, domestic raw	"		.63@.65
Boiled	"		.67
Calcutta, raw	"		.85
Ozokerite	lb.		.11½
Paints and Colors—			
Chrome green, common	"		.05
Pure	"		.16
Yellow, common	"		.10¾
Best	"		25
Lampblack, com'l	"		.04½
Refined	"		.07
Litharge, Am. powd	"		.04¾@.05¼
English flake	"		.08¼@.08½
Glassmakers'	"		.07¼@.08

Paints and Colors—	Cust.	Meas.	Price
Metallic, brown	sh. ton		$ 19.00
Red	"		16.00
Ocher, Am. common	"		9.25@10.00
Best	"		21.25@25.00
Dutch, washed	lb.		.04¾
French, washed	"		.01¼@.01¾
Orange mineral, Am	"		.07¾@.08
Foreign, as to make	"		.08¼@.11¼
Paris green, pure, bulk	"		.12
Red lead, American	"		.05¾@.06
Foreign	"		.06⅜@.08
Turpentine, spirits	gal.		.48
White lead, Am., dry	lb.		.04½@.04¾
American, in oil	"		.05¼@.05¾
Foreign, in oil	"		.07⅛@.09⅛
Zinc, white, Am., ex dry	"		.04⅜@.04⅝
American, red seal	"		.06½
Green seal	"		.07
Foreign, red seal, dry	"		.05¾@.08½
Green seal, dry	"		.06½@.06⅝
Potash—			
Caustic, ordinary	"		.04⅞@.05
Elect. (90%)	"		.06½
Potassium—			
Bicarbonate cryst	"		.08¼
Powdered or gran	"		.14
Bichromate, Am	"		.08⅛@.08¼
Scotch	"		.08¼@.09
Carbonate, hydrated	"		.03¼@.03¼
Calcined	"		.03⅛@.03¼
Chromate	"		.35
Cyanide (98@99%)	"		.23
Kainit	lg. ton		9.05
Manure salt, 20%	100 lbs.		.66
Double Manure salt, 48@53%.	"		1.12
Muriate, 80@85%	"		1.83
95%	"		1.86
Permanganate	lb.		.09¼@.10
Prussiate, yellow	"		.13⅝@ 14
Red	"		.36
Sulphate, 90%	100 lbs.		2.11
96%	"		2.14
Sylvinit	unit		.36½
Quartz—(See Silica).			
Salt—N. Y. com. fine	sh. ton		2.00
N. Y. agricultural	"		1.50
Saltpetre—Crude	100 lbs.		3.45@3.50
Refined	"		4.25@4.62½
Silica—Best foreign	lg. ton		10.00@11.00
Ground quartz, ord	sh. ton		6.00@8.00
Best	"		12.00@13.00
Lump quartz	"		2.50@4.00
Glass sand	"		2.75
Silver—Chloride	oz.		65
Nitrate	"		35
Oxide	"		85.@1.10
Sodium—			
Bichromate	lb.		.06¼
Chlorate, com'l	"		.07¾@.08¼
Hyposulphite, Am	100 lbs.		1.60@1.65
German	"		1.70@1.90
Peroxide	lb.		.45
Phosphate	"		.02¾
Prussiate	"		.10½@.11
Silicate, conc	"		.05
Com'l	"		.01
Sulphate, com'l	100 lb.		.82½
Sulphide	lb.		.01¼
Sulphite crystals	"		.02½
Sulphur—Roll	100 lbs.		1.85
Flour	"		1.90
Flowers, sublimed	"		2.15
Talc—N. C., 1st grade	sh. ton		13.75
N. Y., Fibrous, best	"		10.20
French, best	100 lbs.		1.25
Italian, best	"		1.62½
Tar—Regular	bbl.		1.85
Oil barrels	"		3.75
Tin—Crystals	lb.		.20
Oxide	"		.45
Uranium—Oxide	"		2.25@3.00
Zinc—Metallic, ch. pure	"		.07@.09¾
Carbonate, ppt.	"		.09
Chloride solution, com'l	"		.02½
" granular	"		.04½@.04¾
Dust	"		.04½@.04¾
Sulphate	"		.02⅝@.02½

THE RARE EARTHS.

	Cust.	Meas.	Price
Boron—Nitrate	lb.		$1.50
Calcium—Tungstate (Scheelite)	"		.80
Cerium—Nitrate	"		10.00
Didymium—Nitrate	"		35.00
Erbium—Nitrate	"		40.00
Glucinum—Nitrate	"		20.00
Lanthanum—Nitrate	"		30.00
Lithium—Nitrate	oz.		.60
Strontium—Nitrate	lb.		06¾@07
Thorium—Nitrate 49@50%	"		4.50
Uranium—Nitrate	oz.		25
Yttrium—Nitrate	lb.		40.00
Zirconium—Nitrate	"		8.00

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