

THE ENGINEERING AND MINING JOURNAL

(Incorporated.)

253 BROADWAY, NEW YORK.

TELEPHONE. 3095 CORTLANDT. P. O. BOX, 1833.  
CABLE ADDRESS, "MINGERING, N. Y."

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SUBSCRIPTIONS

Single Copies, 15 Cents.  
United States, Canada, Mexico, yearly, 52 copies, in advance, \$5.00  
Other countries in Postal Union, \$7.00  
By Bank Draft, P. O. Order or Express on N. Y.  
English Subscriptions Payable at London Office, £1 8s 9d

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ADVERTISING COPY

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Entered at New York Post Office as Second Class Matter

VOL. LXXII. OCTOBER 26, 1901 No. 17

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With this issue the reading columns of THE ENGINEERING AND MINING JOURNAL appear in a new dress. The old style of wide measure has been abandoned and the column widths have been made uniform throughout. Other typographical improvements will also be observed and will continue to be made as rapidly as circumstances will permit. It is hoped that the changes will meet with the approval of our readers.



The latest developments in the strike agitation among the coal miners of France indicate that the men are to continue at work at least for the present. The condition in the French coal mining industry is not such as to offer any chances for a successful strike, and the miners have acted wisely in determining not to strike at this time. It would simply open new markets for British and American coal and make worse the matters about which the miners complain. The demands were for an eight hour day, with a minimum wage, and a pension after 25 years of service. They have decided to take the half loaf rather than have no bread.



While the exports of gold from Australia are still made chiefly on British account, we find in recent years great changes in the lines of shipment. Formerly nearly all the Australian gold went to London direct, and increased the receipts at that center; now it is distributed direct from Australian ports. Thus we find that for the eight months ending August 31 the total gold exports of the Commonwealth amounted to £8,615,980, an increase of £1,110,461 over the corresponding period in 1900. Of the shipments this year only £3,028,653 went to Great Britain; of the balance, £2,650,000 went to South Africa direct, £1,385,651 to India, and £157,676 to Hong Kong; while the remaining £1,400,000 was shipped to San Francisco. This, of course, effects a considerable saving in freight and other charges, and is the natural result of the better means of communication.



The troubles of the ironmasters in Great Britain seem to be on the increase. According to the *Colliery Guardian*, the iron works are now suffering from a scarcity of coke, and the additional fact that such coke as they are getting is of inferior quality and high in price. As a consequence of this some furnaces have been put out of blast and others which might be started are kept idle. Still other works are so hampered that the operatives can make little more than half time.

The scarcity of coke supply is attributed to the lax manner in which the collieries have been operated so that enough coal suitable for coking could not be raised. Moreover, the high prices for coal has made it more profitable to ship the raw coal than to make coke, and good coking coal is now going to fill bunkers which ought to be made into coke for feeding the blast furnaces. This appears to be a short-sighted policy on the part of the colliery managers. It may be temporarily profitable to them to ship their raw coal, but it is bad for the country at large if conditions are as stated, and it is helping along the "American Invasion," of which we have heard so much. It is reported that the pig iron production of Great Britain for the current year will be scarcely more than half that of the United States.



The great De Beers Company, which practically controls the diamond industry of the world, has followed the example set by the Rio Tinto Company some time ago, and will split up its shares which

are now of £5, or \$25 par value, into two, each of \$12.50. One share will be preferred stock, which will be of value for investment, and the other common stock, the profits on which may be variable, and which will therefore constitute the speculative part of the holding. The preferred stock, by the way, carries no less than 40 per cent dividend, which is the highest rate attached to any preferred stock in the world. At the present time De Beers £5 shares are selling at about £39 in the London market.

The De Beers Company has had a peculiar arrangement under which the so-called "life governors" of the company have had a right to 25 per cent of all the profits in excess of 36 per cent on the stock. It is now proposed to buy out these rights, or capitalize them by giving the life governors—of whom Cecil Rhodes is the best known—160,000 of the new common shares. The nominal value of these shares is £400,000; their market value is not far from £3,000,000. As the share of the profits accruing to the life governors has run up to or over £300,000 a year, they will have actually about 10 years' purchase. Upon the whole the deal is a satisfactory one for them, and probably for the stockholders, also.



Silver shipments to the East continue to show the same features as in the earlier months of the year. There has been a considerable increase in those to the British East Indies, which includes the Straits, as well as India proper, and a heavy decrease in those to China, while the requirements for Japan continue insignificant. For the 9 months ending September 30 we find the totals in value as follows, taking the shipments from London and San Francisco together:

	1900.	1901.	Changes.
India . . . . .	\$23,848,685	\$28,781,069	I. \$4,932,384
China . . . . .	20,780,174	9,631,682	D. 11,148,492
Japan . . . . .	494,570	96,000	D. 398,570
Totals . . . . .	\$45,123,429	\$38,508,751	D. \$6,614,678

Owing to the large demand for India the London shipments show comparatively little decrease, the total of \$32,258,914 this year being less than at the corresponding date in 1900 by only \$1,378,776. The San Francisco shipments, which go chiefly to China, showed a much larger decrease. Their total this year was \$6,249,837, being less by \$5,235,902 than those of last year.

Of the shipments from Australia direct to China we have no record, but they are reported to be somewhat less this year than in 1900.

Taking the average prices of each year, we find that the quantity of silver sent to the East for three-quarters of this year has been approximately 54,418,000 oz., while in the corresponding period of 1900 it was 74,658,000 oz. The decrease was, therefore, 10,240,000 ounces, or 13.7 per cent. The Eastern demand in the 9 months under consideration in 1900 absorbed about 55 per cent of the world's production, probably over 60 per cent if we include Australian shipments. In the present year, assuming that there has been little change in the production of silver—which is probably the case—the East has taken only 47 per cent of the silver produced. From present indications there is not likely to be any material change in the remaining months of the year.



In this issue considerable space has been devoted to a review of the mining and smelting industries of Mexico, which has been prepared with special reference to the coming trip of the American Institute of Mining Engineers, whose itinerary extends into many of the more important mining districts of the Republic. In arranging this review, considerable difficulty was encountered in securing accurate information, particularly for recent years. A few

districts have been described in the proceedings of the technical societies and in technical papers, but, as a whole, the lack of information is woeful. Perhaps some enterprising spirit among the engineers taking the trip will grasp this opportunity to contribute to the world's store of knowledge a full description of the mineral resources and mining conditions of this important country. The task would indeed be great yet the benefit to the mining profession would be commensurate.

Despite the enormous amount of mineral wealth that has been extracted from Mexican mines, there remains an even greater store locked up in the deeper levels of operated mines or in regions yet unexploited. The extensions of the railroad system, the investment of larger amounts of foreign capital and the application of modern methods of mining and ore treatment have resulted in a marked increase in the production of gold, copper and lead during the past few years. The production of silver, however, has not been increased to so great an extent, owing to the fact that lower grade ores are now treated, which were neglected in the past. With a further extension of railroad facilities and the concomitant advantages of modern methods of mining and ore treatment, an influx of those potent factors of development—capital and labor—into many remote regions with great natural resources will result in a large future increase in the mineral production of the Republic. The coming visit of the American Institute of Mining Engineers will doubtless result in a better general knowledge of Mexico's mineral resources and it is to be hoped that some of those who have this especial opportunity of viewing the present conditions of progress will give to the world the benefit of their observations.



#### THE WEEK'S MARKET CONDITIONS

Conditions in the metal markets continue practically unchanged. The fall in copper, which speculators have so earnestly predicted, has not come and does not appear to be any more probable than it was a month or more ago. Stocks of copper—outside of those held by the United Metals Selling Company—are light, while demand for home consumption continues very large, and is improving. There is also more foreign business in sight. In London, while prices for standard copper have fluctuated, refined copper remains steady.

Tin is in good demand for early delivery, and the prospects are for a large future business also. The fluctuations in price, which are still largely speculative, are shown in our market columns.

Lead remains steady and there have been no changes in price. Some of the western mines are beginning to complain of restrictions in production by the smelters, and in some districts the feeling seems rather strong.

For spelter demand remains strong, especially from the galvanizers, and prices are firm.

The silver market is very quiet and prices remain at a low level. There is no special demand at the present time, while shipments to the East are small, as the analysis given elsewhere shows.

In the iron trade this week we can only repeat the story of heavy business in all departments. In pig iron, in steel billets, and in nearly all lines of finished material, producers have their capacity engaged well over the first half of 1902. The rail mills have orders enough, in fact, to carry them through the entire year. Under these circumstances little is heard of export business, and there is no disposition to make any concessions to secure it.

The condition of the anthracite trade continues sat-

isfactory to producers. Demand in the various consuming territories is well maintained, particularly in the West and Northwest, to which territories a very heavy tonnage is going forward. In the East demand is somewhat better than it has been, though there is not the same urgency for coal as in the West, owing to the heavy purchases early in the season.

The Atlantic seaboard bituminous trade shows no change from the heavy demand of the last two weeks, and producers are unable to meet the wants of consumers. This is partly owing to the widespread car shortage which is affecting the coal trade all over the country, both anthracite and bituminous. At the soft coal mines supplying the seaboard, the car supply is now only about 50 per cent. of producers' needs. Prices for coal are very firm, and outside buyers are paying premiums of 10 cents a ton and over. Even the lowest grades have advanced.

The Western and lake coal trade is in the same condition as the seaboard trade. Demand is very heavy, but shippers are generally embarrassed by short car supply.



#### THE RUSSIAN IRON MARKET CRISIS.

As our readers probably know, from our own columns and other sources, Russia has been for some time past suffering from an industrial crisis, which has affected trade in all parts of the Empire. There are no symptoms of recovery apparent as yet; and the crisis has served to add to the industrial depression which is embarrassing Germany and to the doubtful position of affairs in France and Belgium. The causes of the crisis are complex, as is usual in such cases, and go far back of the present time; it is sufficient to note here the effect on the mining and metallurgical industries of the country.

Outside of the Ural District, where operations have been carried on for many years, the iron and steel industry of Russia is of comparatively recent growth, and almost the same may be said of the coal mining industry. The few coal mines and iron works, which were in operation were almost entirely under British and German management, and the growth of these industries was comparatively slow. Their more rapid development may be dated from the time when General Annenkoff—one of the great administrators of our time—pushed through the construction of the Trans-Caspian Railroad, and convinced the government of the Tsar that the consolidation and extension of the Russian power in Central and Eastern Asia depended largely on the improvement of the means of communication. This led to the final adoption of the plan for the construction of the Siberian Railroad; and also to the building of a number of lines in the eastern portion of European Russia, which were needed to furnish proper connections with the Asiatic roads. At the same time the growing influence of M. de Witte and his associates who were strong advocates of the protectionist policy, brought about the further resolve that the new roads should be built, as far as possible, of Russian made material.

The prospect of large government orders at remunerative prices was the impetus needed to start a boom in the Russian iron trade. At the same time the attention of the French people had been turned towards Russia by political events, and it was not the older British and German interests which came in to take advantage of the new opportunities, but Russian corporations, financed chiefly by French and German capital. A number of such companies were floated and large amounts of money spent in building works and opening mines. In a few years the production of iron and steel increased very rapidly. In the six years from 1893 to 1899, the

official statistics show that the pig iron production increased from 69,993,000 poods to 163,155,000 poods—1,125,000 to 2,623,000 tons—while that of finished iron and steel grew in still larger proportion. Concurrently the development of the coal mines of Poland, of the Donetz Basin and of Southeastern Russia was carried out on a large scale to meet the demands of the new iron works and factories.

These industries reached the high point of their prosperity about the beginning of 1900; and at that time the Russian stocks, which were extensively dealt in on the bourses of Paris and Brussels, were at high prices, which were thought to be justified by the large dividends they had already paid. About that time the reaction began, and complaints were heard of falling off in orders and decreasing prices. The chief causes were the lessening of government orders. Some of the more important railroad lines were approaching completion, while financial considerations forced the postponement of other projects. In short, the companies began to realize the risks undertaken in a country where there is practically only one large customer.

Comparisons have often been made between Russia and the United States, and in some respects they are correct, since both have a large territory, great natural resources and abundant opportunities for future development. There is, however, an essential difference in the character of the population. The Russian peasants, who form the great body of the people, are agriculturists, who are in the main contented with their position. They do not take to cities or to any but the simplest trades, while the system of land holding in common prevents any accumulations of property, or of surplus. They have no capital outside of the land and their purchasing power is very small. There is an almost entire absence of the manufacturing, trading and working people who, in the United States, are the great purchasers, and whose accumulations serve to furnish capital for our manufacturing companies. The average consumption of iron and steel is less than in any other civilized country. In 1900, moreover, the limited purchasing power of the people had been still further restricted by two years of famine in several provinces of the Empire—a cause which had also helped to restrict government orders by the large expenditure required in other directions. In the absence of such orders, no competition nor reduction in prices could secure others, and the result was a partial collapse, which has had disastrous results. Most of the new companies had been run on lines familiar to us in boom times. Their surplus earnings had all been used in paying large dividends while they were extending works and selling new securities; there had been no accumulations of surplus or working capital, no provision for any temporary stringency.

The result has been almost a panic in Paris and Brussels. To take only a very few out of many instances, which could be cited, shares of the Donetz Steel Works, which sold a year ago for 1,475 francs are now quoted at 708 francs; Briansk has fallen from 1,485 to 550 francs; Rakhmanovka from 840 to 110 francs, and Volga-Vichera from 412 to 73 francs. The Russian coal stocks are in little better condition. As these shares have been very largely sold to small investors, the result may be imagined.

Of course, there have been many remedies suggested, but they all come back to the same thing—an increase in orders from the government, and this does not seem possible under present conditions. The recovery from the present depression must be slow; and the situation of the Russian metallurgical companies must continue precarious as long as dependence on a single customer continues an essential element in it.

WITH THE MINING ENGINEERS

Mr. Theodore Dwight, who has charge of the arrangements for the Mexican meeting of the American Institute of Mining Engineers, has issued a circular giving the itinerary of the two special trains chartered for the occasion. The itinerary is as follows:

- November 1, Friday, 2 p. m., leave New York, by Pennsylvania Railroad.
- November 1, Friday 4.30 p. m., leave Philadelphia by Pennsylvania Railroad.
- November 1, Friday, 7.15 p. m., leave Harrisburg, by Pennsylvania Railroad.
- November 2, Saturday, 2 p. m., arrive Chicago, by Pennsylvania Railroad.
- November 2, Saturday, 10 p. m., leave Chicago, by A. T. & S. Fe.
- November 3, Sunday, 10.35 a. m., arrive Kansas City, by A. T. & S. Fe.
- November 3, Sunday, 10.50 a. m., leave Kansas City, by A. T. & S. Fe.
- November 4, Monday, 8.10 a. m., arrive Raton, by A. T. & S. Fe.
- November 4, Monday, 6 p. m., arrive Albuquerque, by A. T. & S. Fe.
- November 5, Tuesday, 3 a. m., arrive El Paso, by A. T. & S. Fe.
- November 5, Tuesday, 5 a. m., leave El Paso (Ciudad Juarez), by Mexican Central Railway.
- November 5, Tuesday, 12.30 p. m., arrive Chihuahua, by Mexican Central Railway.
- November 6, Wednesday, 12 night, leave Chihuahua, by Mexican Central Railway.
- November 7, Thursday, 5 a. m., arrive Jiminez, by Mexican Central Railway.
- November 7, Thursday, 8 a. m., arrive Parral, by Mexican Central Railway.
- November 7, Thursday, 8.30 p. m., leave Parral, by Mexican Central Railway.
- November 7, Thursday, 10.30 p. m., arrive Jiminez, by Mexican Central Railway.
- November 8, Friday, 2 p. m., arrive Zatecas, by Mexican Central Railway.
- November 8, Friday, 6 p. m., leave Zatecas, by Mexican Central Railway.
- November 9, Saturday, 10 a. m., arrive Mexico City, by Mexican Central Railway.
- November 10, 11, 12 and 13, Mexican City and vicinity.
- November 14, Thursday, 12 night, leave Mexico City, by Mexican Central Railway.
- November 15, Friday, 7 a. m., arrive Pachuca, by Mexican Central Railway.
- November 16, Saturday, 6 p. m., leave Pachuca, by Mexican Central Railway.
- November 17, Sunday, 9 a. m., arrive Guadalajara, by Mexican Central Railway.
- November 18, Monday, 11 p. m., leave Guadalajara, by Mexican Central Railway.
- November 19, Tuesday, 8.30 a. m., arrive Guanajuato, by Mexican Central Railway.
- November 20, Wednesday, 5 p. m., leave Guanajuato, by Mexican Central Railway.
- November 21, Thursday, 7 a. m., arrive Aguas Calientes, by Mexican Central Railway.
- November 21, Thursday, 12 night, leave Aguas Calientes, by Mexican Central Railway.
- November 22, Friday, 7.30 a. m., arrive San Luis Potosi, by Mexican Central Railway.
- November 22, Friday, 12 night, leave San Luis Potosi, by Mexican Central Railway.
- November 23, Saturday, 5 a. m., arrive Cardenas, by Mexican Central Railway.
- 7.30 a. m., leave Cardenas, by Mexican Central Railway.
- 9.30 a. m., arrive Cafstal, by Mexican Central Railway.
- 11.00 a. m., leave Cafstal, by Mexican Central Railway.
- (Stop at El Abra Falls).
- 2.00 p. m., arrive Choy Cave, by Mexican Central R'y.
- November 24, Sunday, 6 p. m., leave Tampico, by Monterey & Mexican Gulf Railway.
- November 25, Monday, 8 a. m., arrive Monterey, by Monterey & Mexican Gulf Railway.
- November 26, Tuesday, 12 night, leave Monterey, by Monterey & Mexican Gulf Railway.
- November 27, Wednesday, 7 a. m., arrive Barotcran, by International Railway.
- November 27, Wednesday, p. m., leave Barotcran, by International Railway.
- November 28, Thursday, 7 a. m., arrive Eagle Pass, by Southern Pacific Railway.
- November 29, Friday, 9 a. m., arrive New Orleans, by Southern Pacific Railway.
- November 29, Friday, 12 noon, leave New Orleans, Illinois Central Railway.
- November 30, Saturday, 3 p. m., arrive Chicago, by Illinois Central Railway.
- November 30, Saturday, 5.30 p. m., leave Chicago, by Pennsylvania Railroad.
- December 1, Sunday, 6 a. m., arrive Pittsburg, by Pennsylvania Railroad.
- 1.30 p. m., arrive Harrisburg, by Pennsylvania Railroad.
- 4.06 p. m., arrive Philadelphia, by Pennsylvania Railroad.
- 6.30 p. m., arrive New York, by Pennsylvania Railroad.

The two trains (one of which only starts from New York) will be luxurious traveling hotels, with dining cars and observation cars on each train. A drawing room will be reserved for use as a ladies' dressing room and a ladies' maid will accompany each train. Club rules will obtain in the matter of "tips" and gratuities to waiters, etc., are barred.

The dining car service includes a carefully selected stock of wines and cigars, and specially bottled water will be provided free of charge, in order that the danger of indiscriminate water drinking is avoided. Two physicians will accompany the party. Mail and telegrams to reach the party en route should be sent addressed to "Mining Engineers' Special," and sent in care of station agent at points where stops are to be made. An interesting description of the portions of Mexico to be visited is printed elsewhere in this number.

SOME THOUGHTS ON IRON AND STEEL MAKING

BY AN OLD CONTRIBUTOR.

In response to a request for a technical article on a subject of his own choosing, one of the old contributors to the columns of the "Journal" has prepared the following article, which is partly retrospective and partly prophetic, but which he designates as "hash."

Your request for a technical article, choosing my own subject, has been duly received. Because I have written occasional articles for the "Journal" during the past quarter of a century, some of them mathematical, some descriptive, some statistical, some critical, some politico-economical, some historical and some even prophetic, the new editorial management may think that I have several barrels of stuff on tap which may be drawn upon at any time. If so, the management is mistaken. All the articles I have ever written for any paper may be divided into two categories: (1) Those upon the subject of which I had long thought and felt that I ought to write about; (2) Those whose subjects were given me by the Managing Editor with ample time, a month or two if necessary, in which to study up the subject before writing about it. Your present request seems to me to come under a third class—a literary "hold-up."

In all my career as an engineer, with occasional literary aberrations, have been only once "held up" for an article in this manner. It was twenty years ago, and I was then the technical editor of a trade journal, and was called on for an editorial at an hour's notice. I was at my wits' end, when suddenly I recollected that I had visited the Cambria Iron Works, at Johnstown, Pa., a few days before, and that there I had obtained one new idea, which I elaborated somewhat to this effect: "There is a new revolution impending in the iron and steel business. Works that formerly devoted themselves to producing iron and steel in an intermediate stage, such as pig iron, blooms and billets, for other concerns to finish, and making themselves no really finished product except rails, are now adding extensions to their works for the purpose of making finished articles. Thus the Cambria Company has put in a wire rod mill, and is going to make wire, and even work the wire into shapes, such as barbed wire fencing, door mats, wire nails, etc. It is also going to make forgings, car axles and the like. We will soon see iron works that own their coal and ore mines, and carry the iron through all stages of manufacture, making finished articles ready for the final consumer."

This little article, so hurriedly called for, was highly successful from a journalist's point of view, for it was copied all over this country and England, with due credit to the paper in which it first appeared. It was also prophetic, for the revolution then said to be impending has come to pass, and the gigantic combinations now controlling the trade are the direct result of that change.

Speaking of these combinations reminds me of the wonderful stroke of business made by Mr. Carnegie when he sold out to the Steel Trust. I have considered if he did not get fully three times as much for his property as he would have taken for it only three years before. How did he do it? First, he gradually acquired the strategic position. He controlled the best ore and coal mines, enough coke ovens for his needs, the largest and best blast furnaces, the means of transportation, and had reserve capital for making extensions far beyond that of his rivals. He was already far ahead of his competitors in ability

to produce steel cheaply, and to put it into varied forms. The boom period came, bringing with it a demand sufficient to take all the product that he and his rivals could make. Was there anything more to do, except simply grow as he had been growing? Only to go into new lines of finished products. He could build a tube mill bigger and better than that of the National Tube Company, and he could put it in a better location than McKeesport—Conneaut, on Lake Erie. At that point he could bring the ore and coke together, with his railroad and steam vessels, more cheaply than any rival; he could build works without any bonded indebtedness; he could have water transportation to the Atlantic Coast by way of the Erie Canal; he could control the export trade in iron and steel. More than this, when dull times came again and demand slackened, he could lower his prices so as to compel as many of his rivals as he chose to shut down their works. Such was the situation less than a year ago. His rivals had their eyes opened to it, and saw the necessity of some concerted action. "The works at Conneaut must not be built at present, and the only way to prevent it is to buy out Mr. Carnegie," was the advice of the financial doctor, Mr. J. Pierpont Morgan. To buy out the richest iron manufacturer in the world, just at the time when his profits were the greatest, and when he has obtained a position that threatens his rivals with ruin, was a staggering proposition. "The public at large," said Morgan, "will furnish the money." And it was done; the consolidation of all the great works took place, Mr. Carnegie got his price, and what is more wonderful still, the others got theirs. Whether the future course of the market will bring high prices and big dividends or not, the public that owns the works is to be congratulated upon having a managing force of splendid ability. It is to be expected that the technical managers will continue to be as enterprising and as judicious as they have been in the past, and the works ere long exhibit more triumphs of engineering.

The Conneaut Works, postponed by the consolidation, are probably not indefinitely postponed. The demand for iron and steel is bound to increase, although irregularly as in the past, and new works must be built to meet it. The export trade is now falling off, on account of increased demand in this country and decreased demand in Europe, and we can only regain that trade by again underbidding Germany. The cost of production is decreasing in Germany, and if this country would meet it it must build still better works than now exist. The advantages of the location on Lake Erie are so great that it would seem that the new works ought to be erected there. From a metallurgical point of view it would seem that there is but little further chance for improvement in the manufacture of steel. All the machinery, from the mine to the finishing mill, is now practically automatic. Nothing is lifted, or pulled, or pushed by the hands of man. Locomotives, overhead cranes, automatic hoists, charging and drawing machines, feeding tables, conveyors and gravity do everything.

Economy of fuel, however, is far from being what it should be. The waste gases of the blast furnaces are not yet utilized to the extent they might be. Gas engines to use these waste gases are extensively used in Europe, but they are not yet introduced here. Coal-fired boilers are still wasting coal, and the steam consumption of the average engine in our iron works is about double what it should be. The first effort of an American manager is to increase production, the second is to make the work automatic, in order to save labor and increase production, the last is to save fuel, and this stage he has not yet reached, so far as the fuel required for power is concerned, although he is well in advance in the economy of fuel used for smelting and for heating.

COAL IN SOUTH AFRICA.—The Cyphergat Coal Mining Company, Limited, has secured a contract to supply the Cape Government with 18,000 tons of coal at 18s. per ton. The contract is for a year from October 1.

NOTES ON THE MINING AND METALLURGICAL INDUSTRIES OF MEXICO.

By JOSEPH STRUTHERS, PH. D.

It is a remarkable fact and one to be deplored by the mining engineering and allied professions that there is so little information published on the mining and metallurgical industries of Mexico. A few articles have appeared scattered throughout the papers of scientific societies and the technical press, but no attempt has been made to discuss in a systematic manner the mineral resources of this important country. In early centuries gold was produced in enormous quantities for that period and history has shown the penalty that the natives paid for their industry in the production of this precious metal. Later under Spanish influence this country stood pre-eminent in the production of both gold and silver and although the progress of development has been hindered by peculiar conditions of labor and climate, untold wealth has been extracted from her many mines and there yet lies stored in the lower levels of operative mines and in unexplored regions a vast wealth of both precious and base metals whose extraction in the future, will place Mexico in a prominent position among the metal-producing countries of the world.

*The General Geology of Mexico.*—The higher mountain ranges are as a rule of granite formation which seems also to be the foundation of the plateaus, above which rise the traps, basalts, porphyries and the more recent lavas and igneous rocks of every geological epoch. These form to a large extent the superstructure of the central plateaus, although the Mexican table land appears to consist mainly of metamorphic formations which have been partly unheaved, partly interpenetrated and overlaid by igneous masses, chiefly, represented by shales granwacke, greenstones, siliceous schists and unfossiliferous limestones. All these formations contain abundant deposits of metalliferous ores, chiefly gold, silver, lead and copper. In Oaxaca and in the southern slopes facing both oceans, gneiss and mica schists prevail, but the highest ranges are mainly of plutonic or volcanic rocks, granites, syenites, diorities, mineralized trachytes, basalts, porphyries, obsidian, pearlstone, pumice, sulphur, lavas, tufas and other recent volcanic discharges. The most valuable rocks are the argentiferous porphyries and schists of the central plateau and of Sinaloa and the auriferous deposits of Sonora. Horizontal and stratified rocks, of very limited occurrence in the south are largely developed in the northern states, and chalk becomes very prevalent toward the Rio Grande and the Rio Gila Valleys. None of the horizontal layers seems to be very rich in ores. To this chalk and to the sandstones are probably due the vast sandy plains in Northern Mexico which extend far into New Mexico and Texas.

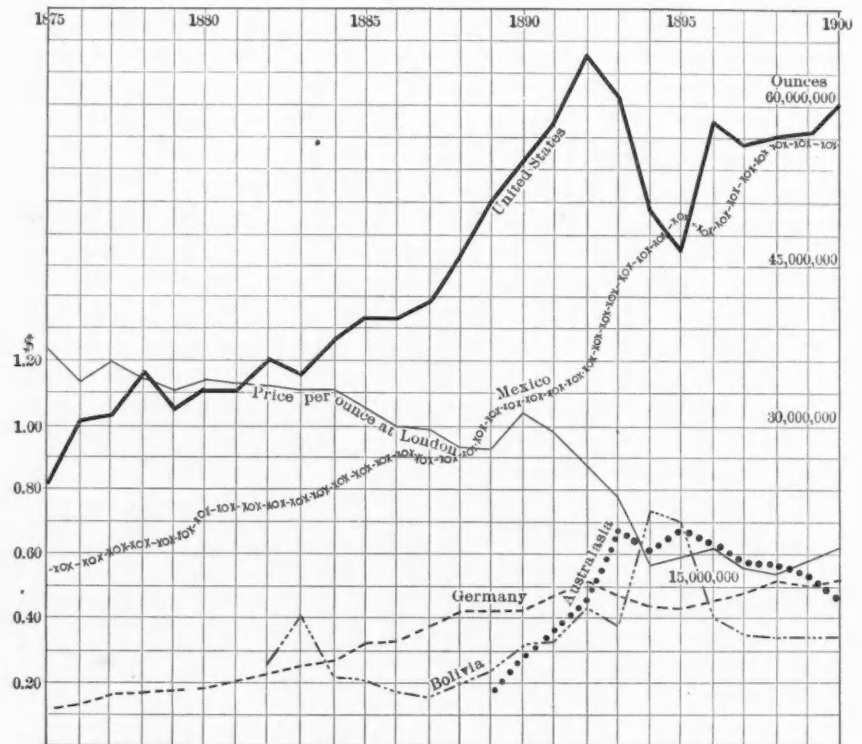
The mining regions follow the direction of the Sierra Madre range and extend from Oaxaca in the southeast to Sonora in the northeast, a distance of 2,574 kilometers of a general width of 402 kilometers. The richest mines so far discovered lie in the South Central Plateau, of from 1370 to 2,900 meters elevation above the sea level. Probably the richest known argentiferous region in the whole world is on a line drawn from Oaxaca on the south, through Guanajuato to Guadalupe, Chihuahua, on the north. According to official reports for the year 1900, there are 1092 mining districts in the Republic, of which 553 are silver or silver-lead propositions, 237 gold mines and placers, 141 coal, petroleum, etc., 68 cinnabar, 41 copper, 36 lead and 16 tin, and during 1898 to 1899 taxes were paid on existing lodes to the number of 8,970, covering an area of 84,557 hectares.

*Mineral Resources.*—The mineral resources of Mexico are so vast in amount that the Republic may be considered one of the richest mining countries in the world, and while the metal-bearing districts have been exploited during the past 400 years by innumerable mining enterprises and immense quantities of precious metals have been extracted,

a great part of her mineral wealth still lies undisturbed, awaiting the application of modern methods of mining and treatment. Under the favoring conditions of railroad extension and influx of foreign capital and labor, Mexico will be placed in the foremost rank of the metal-producing countries of the world. Early in the nineteenth century Humboldt estimated the number of mines in Mexico to reach 3,000 and while many have been idle during recent years, the extension of railroads bringing remote regions into close communication has caused a revival of interest in the mining industry. In spite of imperfect methods of extraction, lack of proper transportation, inefficient labor and other drawbacks, Mexico has already produced more than one-third of the total output of silver in the world.

production of silver in 1900 was 57,684,429 oz. as compared with 55,032,838 oz. in 1899. The diagrammatic chart below, taken from the *Mineral Industry*, Vol. IX, p. 317, shows the production of silver in the principal countries of the world from 1875 to 1890, and clearly illustrates the important position that Mexico occupies in the production of this precious metal.

Gold occurs in Mexico chiefly in Sonora on the slopes facing the Pacific Ocean near the gold-bearing region of California, and its production from this source will probably be largely increased, especially since the Yaqui Reservation has been thrown open to the public. In Guerrero and in Oaxaca as well, considerable gold is produced from shallow placers and from the crude *arrastra* treatment of ores, and in other districts deposits of this



THE WORLD'S PRODUCTION OF SILVER IN TROY OUNCES.

More than half of the silver already produced in Mexico has been taken from the central mining districts of Guanajuato, Zacatecas and San Luis Potosí (Catorce). The Veta Madre lode of Guanajuato alone produced \$250,000,000 in silver between 1556 and 1803 and according to Humboldt early in the nineteenth century the famous mines on this lode, the "Conde de Valenciana" and the "Marques de Rayas," produced annually 4,000,000 ounces of silver. Including the La Luz and Cardones district the total production from the Guanajuato region is stated to amount to \$1,500,000,000. Under the old primitive methods of unwatering mines by buckets, the depth to which the shafts could be sunk was quite limited, and many of the older mines were worked to this level and then abandoned, although containing vast quantities of ore at greater depths. Owing to this cause and to the scarcity of labor the mining industry of Mexico has declined considerably until recent years. At present, however, the introduction of modern methods of mining and treating the ores and the beneficial effect of railway extension have revived the interest in this important industry. Many other localities might be named in which silver ores are mined, usually of low grade but in great abundance. Generally speaking, the ores occur in calcareous rocks or else connected with eruptive rocks, often trachyte. About one quarter of the silver production of Mexico is deposited at the mints for coinage, the remainder being exported mostly to the United States in the form of ores, sulphides, base bullion and in copper mattes. The

type have been reported. The precious metal also occurs in many silver ore deposits, principally in the State of Zacatecas. The production of gold in Mexico during the past five years is given in the subjoined table, and the present activity in exploring and developing gold-mining properties while having no great effect on the immediate production will doubtless be reflected in future returns. A number of old mines which have been closed down for years are being unwatered and placed in repair and with modern methods of working, the shafts will be extended to greater depths with advantage to the development of the mining industry. There are also immense heaps of tailings resulting from the primitive methods of ore treatment that are of sufficient value to yield a profit when worked by modern methods, including concentration and perhaps cyanidation, in fact at many of the old mines the Indians often make a living by working over old tailings as shown in Fig. 1.

PRODUCTION OF GOLD IN MEXICO FROM 1896 TO 1900.

	Kilograms.	Value.
1896.....	9,493	\$6,309,181
1897.....	10,715	7,121,139
1898.....	12,394	8,236,720
1899.....	12,394	8,236,720
1900.....	14,158	9,409,063

A large part of the production of copper in Mexico in the past few years has been derived from the Boleo and adjacent mines in Lower California although recently the Nacosari mines have added considerably to the output. According to Fuchs

the ore in the mines operated by the Boleo Company occurs in three beds, interstratified with argillaceous tufa and conglomerate, the country being traversed by eruptive rocks, chiefly trachytes. The beds appear tufaceous and to contain various oxidized ores occurring generally in concretionary spherulites. Work was commenced in 1884 and by 1900 the company produced 11,227 of the total 22,403 metric tons. Copper shipments from Mexico seem to have commenced about 1886 when 163 tons were exported. Among the other copper producers are the Guggenheim plants at Aguas Calientes and at Monterey; the Mazapil Copper Co., Zacatecas; the Descubridora of Hornillas, Durango; the Magistral Victoria, Chihuahua, and the San Carlos Copper Co., of San José, Tamaulipas. The Mexican Government does not collect statistics of production although the *Boletín de Estadística Fiscal* gives the mineral exports of the country. From this source the shipments of copper during the past four years were as follows:

Exports of Copper in Ore and Ingots for 1896-1900 (in Metric tons and Mexican Dollars) and the average value of the Mexican dollar in New York during this period.

Year	Metric tons	Mex. Dollars	Average value of Mexican dollar in New York
1896	144	\$5,210	20.659
1897	1,095	176,391	16.858
1898	13,146	3,738,738	10.362
1899	223	54,828	25.293
1900	408	49,736	27.970

The progress of the lead industry in Mexico during the past five years is well illustrated in the subjoined table, from which may be seen the increase of nearly fifty per cent from the production of 63,000 metric tons in 1896 to 90,612 metric tons in 1900. The production in 1890 was 22,300 metric tons. The gradual increase in the silver production of the Republic in recent years to the year 1898 has resulted largely from the greater output of lead, although in the past two years, while the production of lead has increased greatly, the output of silver has remained practically constant—an anomaly which is explained by the fact that lower grade of argentiferous lead ores are now treated more successfully than was formerly the case. The great development of the lead industry in Mexico during the past few years has resulted mainly from tariff legislation in 1889, which imposed a local duty of 2.6 per cent of the value of the silver and lead contents of the ores exported, and in 1896 an additional Mexican tax of 4.5 per cent on the silver content as well as the United States import tax in the same year of 1.5c. per pound on the lead content of the ores. The object of the United States legislation was to relieve the Colorado smelters who believed that the importation of lead ore would seriously affect their business through the competition of the Missouri River smelters, to whom the Mexican ore was shipped. The imposition of the duties, however, in place of abolishing the threatened evil, added to it, as the resultant shortage of basic ores from Mexico caused an increase in smelting charge to the Colorado miners of \$1.00 per ton for the treatment of their siliceous ores. The effect of the tariff legislation has been most favorable to the development of the lead industry in Mexico and has resulted in the investment of enormous sums by American interests in the establishment of many large smelting plants on Mexican soil employing thousands of men. The principal sources of lead ore supply in Mexico are the Sierra Mojada Mines in Coahuila, the Santa Eulalia Mines in Chihuahua, the Mapimi Mines in Durango, and those in the vicinity of Monterey, Nueva Leon. Other less important mines exist whose smaller outputs have been absorbed by custom smelters or have been treated locally. During the past five years, in addition to the consumption of lead ores by the smelters in Mexico, 150,000 tons of ore at least have been shipped annually to the smelters of the Kansas City Smelting and Refining Company (now combined with the American Smelting and Refining Company) at El Paso, Texas. This large amount of exported ore has been derived from the Sierra Mojada and Santa Eulalia Mines, mainly from the former. The ores assay from 10 to 20 per cent of lead and from 12 to 15 ounces of silver per

ton. It may be stated that 90 per cent of the silver production of Mexico is now obtained from ores smelted in blast furnaces for lead—these ores may have sufficient lead to extract the silver content, or if not the so-called "dry" ores—they are added to the charge mixture for the furnace which has enough lead to extract the total silver content of the entire charge.

The production and export of lead in Mexico, 1896-1901, from statistics compiled by "THE MINERAL INDUSTRY."

Year	Production Metric tons	Export Metric tons	Base Bullion Value Mex. Cur'cy.
1896	63,000	48,663	\$1,340,785
1897	71,637	60,029	3,006,821
1898	71,442	60,918	3,291,014
1899	84,656	67,441	3,885,747
1900	90,612	74,944	4,278,608



FIG. 1.—WASHING THE TAILINGS.

Quicksilver occurs in various places in small quantities, associated with rocks of the green sand formation of the Cretaceous period. The most important districts are Guadalcázar and Huitzoco, in the State of Guerrero. In the former locality it occurs in calcareous rocks of the Cretaceous age, where it forms veins and impregnations: the age of the formation and nature of the deposits being similar to those in California. In 1894 the Guadalcázar district produced about 2,500 flasks, and Huitzoco about 5,000 flasks—these two districts producing 260 of the 268 metric tons in Mexico in that year. The production for 1900 amounted to 335 metric tons.

Until within the past year or two, coal mining in Mexico has not been developed to any great extent, although some progress had been made in various districts of the republic. The Fuente coal mines near Eagle Pass are being operated on the lignite deposit, which is similar in character to that at Laredo, the bed of lignite appearing to exist on both sides of the Rio Grande River, and to the south of the Fuente mines. In the valley of the Sabinas, the Mexican International Company have been working for the past 10 years, though the coal beds are thin and badly interstratified with slate. The output of these mines has been largely consumed for firing the locomotives on the Mexican International Railroad—and 120 coke ovens have been erected to supply coke to the copper smelters in the northern part of the republic. In various other districts lignite occurs, but in nearly every case the poor quality of the

deposits did not warrant the extension of railroad connections necessary to exploit them.

Large deposits of good grade anthracite have been reported in Sonora, but their distance from the railroad in most cases has prevented development in these fields. In 1899, however, the Conquista Coal Railway Company opened up an extensive colliery and constructed a branch line of railroad from the mines to the main line of the Mexican International Railway, 15 miles distant.

Among the more progressive coal mining companies operating in the republic is the Mexico Central Coal and Coke Company, at the Esperanzas mines, Barroteran, 88 miles from Eagle Pass, Tex. Development work has been pushed rapidly since the conces-

sions were granted, November 5, 1899, and a modern equipment of mine and washing plant has been constructed, as well as a number of coke ovens and a ten mile railroad spur to the main lines.

In December, 1900, the output of coal from this colliery amounted to 1,500 tons. A more detailed description of these mines is given under the caption "Coahuila," elsewhere in this article.

The subjoined table of the production, imports and exports of coal of Mexico for the past five years illustrates the small progress that has been made in the development of this important mineral industry.

Production, Exports and Imports of Coal in Mexico for the five years 1896-1900.

Compiled from Statistics Collected by The Mineral Industry in Metric tons and Mexican Currency:

Year	Production		Exports		Imports	
	Tons	Dollars	Tons	Dollars	Tons	Dollars
1896	253,104	75,541	312,738	236,124	666,774	
1897	359,070	105,298	434,624	363,387	958,230	
1898	367,193	118,553	486,596			
1899	409,125	113,192	453,393			
1900	387,977	38,676	157,282			

(a) From the *Estadística Fiscal*.

The principal mining districts or mines in the Republic of Mexico are classified by states as follows:

- Aguas Calientes.**—Asientos and Tepezalá.
- Coahuila.**—Sierra de Mojada, Sierra de Jimulco, Sierra de Homes.
- Chihuahua.**—Batopilas, Cerro Colorado, Santa Eulalia, Jesus Maria, Cusihiuiriachic, Concepcion, Magurichic, Guazapares, Urique, Guadalupe y Calvo, San Francisco del Oro Hidalgo del Parral and Santa Barbara.

**Durango**—Guanaceví, Indé, El Oro, Avino, Conejo, Topia, Sianori, San Bernardino, Copalquin, and the older districts of Gavilanes, San Dimas, Tominil, Guarisamey, Ventanas, Corpus Comitala, Durango, Cuencamé, Noria and San Juan de Guadalupe.

**Guanajuato**—La Luz, Rayas, Valenciana, Sirena, Santa Rosa, Monte de San Nicolás, Villalpando, Nayal, Santa Ana, San Bruno, Joya, Mejiámora, Vejera, Durazno, Atarjea, Gato, San Pedro de los Pozos, Xichu and San Luis de la Paz.

**Guerrero**—Tasco, Tehuilotepic, Juliantla, Huítzuc, Limon, Ajuchitlan, Tepantitlan and Coronilla.

**Hidalgo**—Pachuca, Real del Monte, Regla, Atonilco el Chico, Zimapan, Jacala, Cardonal, La Bonanza, La Pechuga, Santa Rosa, Capula and Tepenené.

**Jalisco**—Bolanos, Hostotipaquillo, Reyes, Bramador, Estancia, Cuale, San Sebastian, Comanja and Pihuamo.

**Lower California**—El Triunfo, San Antonio Carachilas and El Boleo.

In the order of travel, the States to be visited are Chihuahua, Durango, Zacatecas, Aguas Calientes, Guanajuato, Hidalgo, San Luis Potosi, Nuevo Leon and Coahuila.

#### CHIHUAHUA.

There are numerous mining districts in this State producing gold, silver, argentiferous galena, oxidized copper ores, quicksilver, coal and iron. Of these the more important are Santa Eulalia, Batopelas, Cerro Colorado and Parral.

The Santa Eulalia silver mines were among the earliest mineral discoveries of the Spaniards in Northern Mexico, and their former great importance is shown in the official records which state that from 1705 until 1737 the annual production of silver reached an average of nearly \$2,000,000. The acknowledged production from 1705 to 1791 amounted to nearly \$112,000,000 and their entire production from one-third to one-fifth more than this amount. Owing to hostilities of the Indians and to

of the largest caves. The ores are mainly chloride and sulphide of silver, argentiferous galena and other lead minerals, together with occasional chlorobromide of silver (embolite) and iodide of silver (iodyrite). They are quite ferruginous, which accounts for their brittleness and the courses are always marked by iron stains, following cleavages, joints, planes of bedding and sometimes reticulated solid beds; in all these occurrences no definite order or limit exists. One or more beds may be so thoroughly webbed with segregations of so decided a character as to impart a concretionary appearance or as if limestone breccia were cemented by ferruginous ore. These ferruginous portions always afford good mining ground.

The mines of Santa Eulalia are scattered over the great limestone uplift and along the deep ravines with which it is scored. They are all contained within an area of five square miles. In the hillsides the workings are mostly horizontal while a few ancient shafts and deep workings are located both on the hills and in the ravines. The mines are divided into three groups, the Santo Domingo, the Guadalupe and the Dolores. The Santo Domingo group comprises the Santo Domingo mine, valued for the desirable lead component of the ores as well as for the silver, and the mines on the east side of the ravine—the Chiquihuite, Rosario, Gertrudis and San Lazaro. The Dolores group is composed of the Dolores, San José, Parcionera and San Matias.

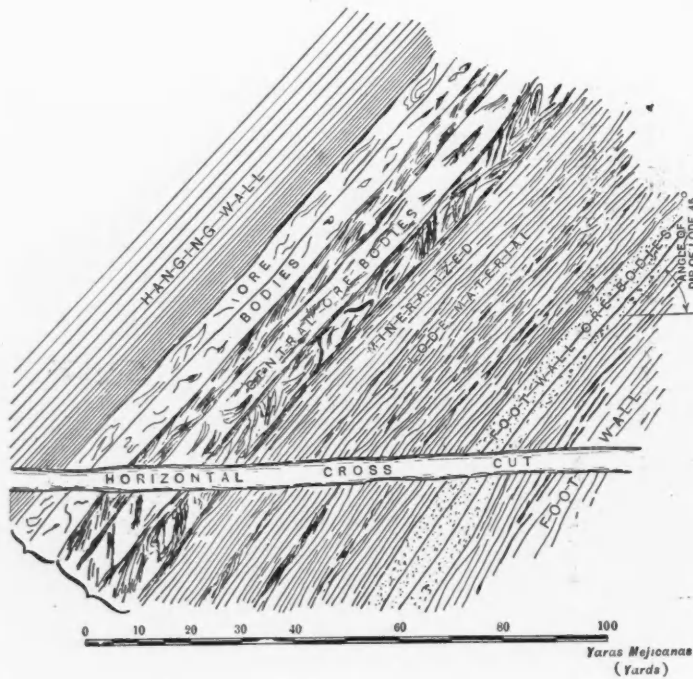
The Guadalupe group includes the Guadalupe mine directly over the Parcionera and San José mines, the Aragon, and several mines clustered in the left side of the limestone ridge—the Santa Rita, San Francisco, Purisima, Negrita Grande, Nigrita Chiquita and the Carmen.

James P. Kimball in his report on the Silver Mines of Santa Eulalia, 1870, states that notwithstanding the number and size of the excavations in the mining ground and the enormous returns that these have afforded, its future prospects seem scarcely impaired by the achievements of the past. His prediction is well fulfilled, as this district is now one of the most important mining districts of the State.

Batopilas is 500 kilometers S. W. of the City of Chihuahua at an elevation of 700 meters above the sea. The principal veins of this district are in diorite surrounded by porphyry and many of them outcrop at the surface showing metallic silver in the form of wire, plate or slabs. Rich silver sulphide ores also occur. According to their composition the ores are treated by amalgamation in patios or pans, by lixiviation with hyposulphite, or, if of great richness or too base in character, they are shipped to smelting works. The mining zone of Batopilas is divided into 44 sections, each of which measures 2,000 meters square. During Mexican Colonial times these mines were one of the prominent sources of the silver production of Mexico and contributed largely to the Spanish treasures taken from the country. Later, they were abandoned for many years until 1878, when an American company became interested in them.

The completion of the Porfirio Diaz tunnel in the year 1900 after 15 years of work has placed the extensive low-grade ore bodies in a position to be mined at a low cost; in addition the company is now able to prospect for bonanzas at a much greater advantage. If economically handled, the low-grade ores will yield a profit and any of higher grade will add correspondingly to the returns. The ore is free-milling and formerly was extracted by arrastras, operated with horizontal water-wheels. Its value is stated to average 12.5 ounces silver and one ounce gold per ton. Since 1897, the mine has been systematically developed and a modern milling plant comprising 20 stamps, 2 crushers, 7 vanners and Pelton water-wheels, has been erected. The capacity of the mill is 75 tons per day.

At Cerro Colorado 12 kilometers N. of Batopilas, there is an interesting gold formation. The hill of Cerro Colorado, measuring 1,500 meters in length, 1,000 in width and 500 in altitude, is composed of a soft porphyritic rock carrying native gold



SECTION OF VETA MADRE VEIN, SHOWING THE THREE DISTINCT ORE CARRYING VEINS.

**México**—Mineral del Oro, Temascaltepec, Sul-tepec, El Cristo and Zacualpan.

**Michoacan**—Tlalpujahuá, Angangué, Curucupa-seo, Inguaran, Churumuco, and Coalcoman.

**Morelos**—Huautila.

**Nuevo Leon**—Iguana, Montanas and Minas.

**Oaxaca**—Ixtlan, Villa Alta, Teixomulco, Peras and others.

**Puebla**—Tetela del Oro, La Preciosa, Chiautla, Epatlan, Tecomatlan and Chietla.

**Querétaro**—Las Aguas, El Doctor, Maconí and Escanela.

**San Luis Potosi**—Cerro de San Pedro, Catorce, Guadalcázar, Charoas, Bernalejo and Ramos.

**Sinaloa**—Guadalupe de los Reyes, San José de Gracia, Alisos, Joya, Cosala, Panuco, Copala and Rosario.

**Sonora**—Arizona, Zubiata, Jamaica, Cobre, San Antonio, Bronces, San Javier, Aigamé, Alamos Arizpke and Altar.

**Tamaulipas**—Sierra de San Carlos and Sierra de San Nicolás.

**Veracruz**—Tatatila and Zomelahuacan.

**Zacatecas**—Zacatecas, Veta Grande y Pánuco, Fresnillo, Sombrerete, Chalchihuites, Plateros, Potrero, Mazapil, Pico de Teyra, Bonanza, Mezquital, Pinos and Mesquital del Oro.

The following districts have been selected and described with special reference to the itinerary of the American Institute of Mining Engineers, whose extended trip throughout Mexico will occupy nearly the entire month of November, 1901.

political troubles the district retrograded and during the nineteenth century operations by the Mexicans were never fully resumed, although in recent years considerable activity in mining has been shown. The village of Santa Eulalia is 15 miles east of the City of Chihuahua and the mining ground is embraced within the area of an uplift of Cretaceous fossiliferous limestone. The mines may be said to be grouped in a great boss of this formation, the stratification of which is plainly shown in the escarpments formed by the cutting through of the water courses. In this region the dip is from 5 to 15 degrees. The oldest and most extensive mines are the deep ones of Dolores, Vieja and Aguada together with the shallow workings of the Parcionera, San José and San Matias. According to Kimball, the mineral deposits are quite unique; in one instance only, in the Santo Domingo mine, was the vein formation well defined. These deposits are more or less irregularly distributed in a variety of ways all being contained however in the nearly horizontal fossiliferous strata of the Cretaceous period. The strata above the water level are exceedingly cavernous and caves entirely shut off from the surface are encountered in nearly all of the workings, some being of enormous size, notably the great cave of the Parcionera and San José mines. Drusy cavities or vugs of all sizes are the smaller evidences of the same prevailing cavernous character and often yield excellent pockets of ore—as exemplified by the rich bonanzas that have been frequently found in the chambers of the walls

that is excessively fine, although veins or masses of large size are occasionally found. The iron pyrite which accompanies the ore is generally of a low grade and unprofitable to work. The vein is very regular and the gold ore occurs in very rich pockets or bunches or in long stretches of clay barely rich enough to pay for treatment. The average richness of the ore is reported to be one ounce of gold per ton. The ores are treated by amalgamation at the works a short distance from the principal mine, the San Gabriel.

The smelting plants of the Chihuahua Mining Company and the Sabinal Mining and Smelting Company at Chihuahua have been shut down, the ores being purchased by the American Smelting and Refining Company. The same condition exists at the plant of the Candelaria Mining Company at

tion will bring the camp's mill output to 475 tons daily. The output of the Parral district in shipping ore during August, 1901, was 12,000 tons of ore which averaged about 35 ounces of silver per ton. A full description of the mining development of this important camp was published in the ENGINEERING AND MINING JOURNAL, Oct. 12, 1901. The recent activity in the mining district has been due to the completion of the Parral branch of the Mexican Central Railroad from Jiminez.

The leaching of silver ore by sodium hyposulphite is practiced in many localities throughout the Republic. Perhaps the process can be seen to best advantage at Parral, where the Parral Mining Company have constructed a mill but a short distance from the railroad station, or at Minas Nuevas, where the Hidalgo Mining Company has installed a

Mine, the Campania Coahuilense, the Bevis Mining Co., the San Vicente Co., the Mopal Co., the American Zinc Extraction Co., and the Prieta Gold and Silver Mining Co.

DURANGO.

Gaunaceví, 100 miles south of Parral, is the largest silver camp in the State of Durango and is noted for the large amount of high grade ore produced, as well as for the number of costly mills that have been erected. At least eight crushing and leaching plants have been installed, a number considerably in excess of the present demands of the region. The veins are not very large but are of great richness. The most prominent mine is the Baradon, the shaft of which has been sunk to a depth of 600 ft. An analysis of ore from the Purisima, one of the smaller mines, gave 43 ounces of silver and 2.88 ounces of

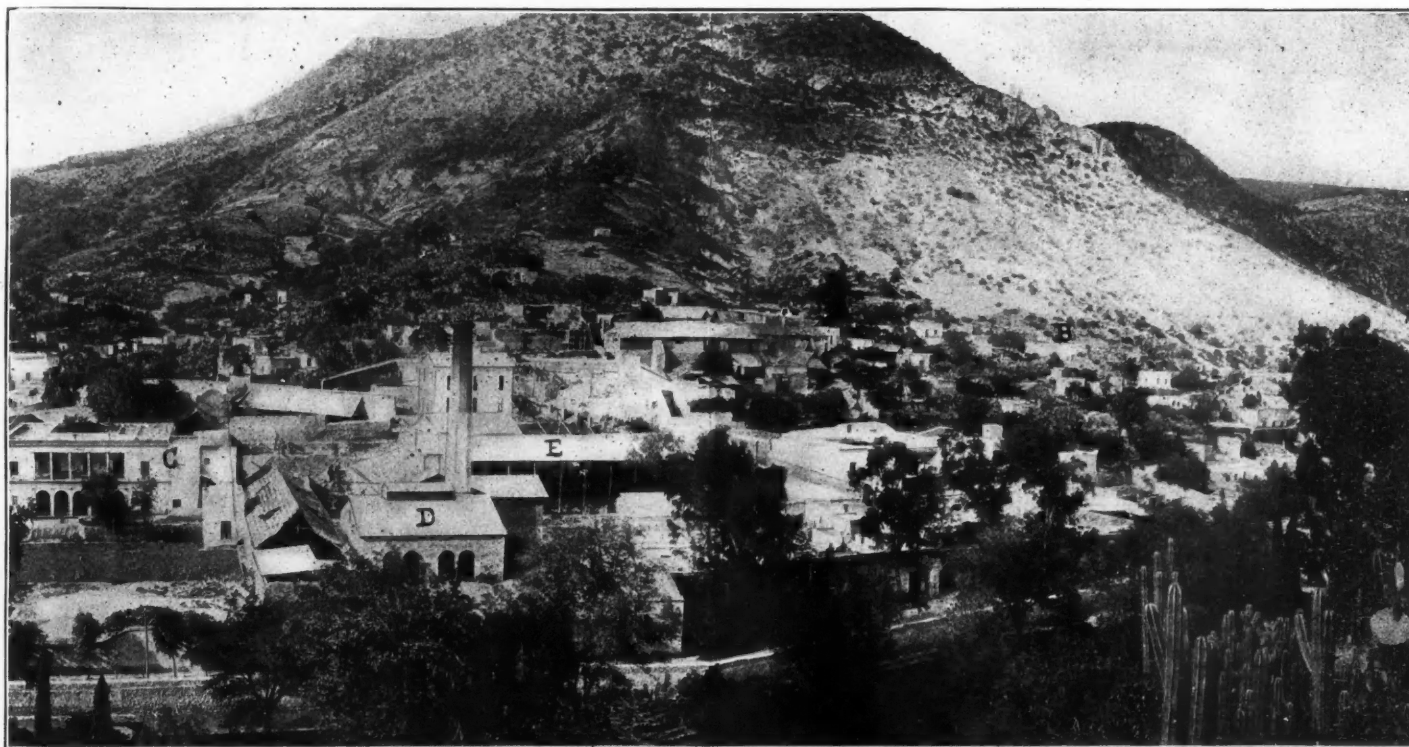


FIG. 4.—SIRENA MOUNTAIN AND THE WORKS OF THE GUANAJUATO CONSOLIDATED MINING AND MILLING COMPANY. A—Sirena Mine. B—Tramway from the mine to the Hacienda. C—Hacienda de San Francisco. D—Power house. E—Stamp mill. F—Ore bins.

Ciudad Juarez—the smelting equipment here consisted of three water-jacketed lead furnaces, one reverberatory roasting furnace and two English cupelling furnaces. The present supply of ores from these mines is shipped to El Paso for treatment in bond.

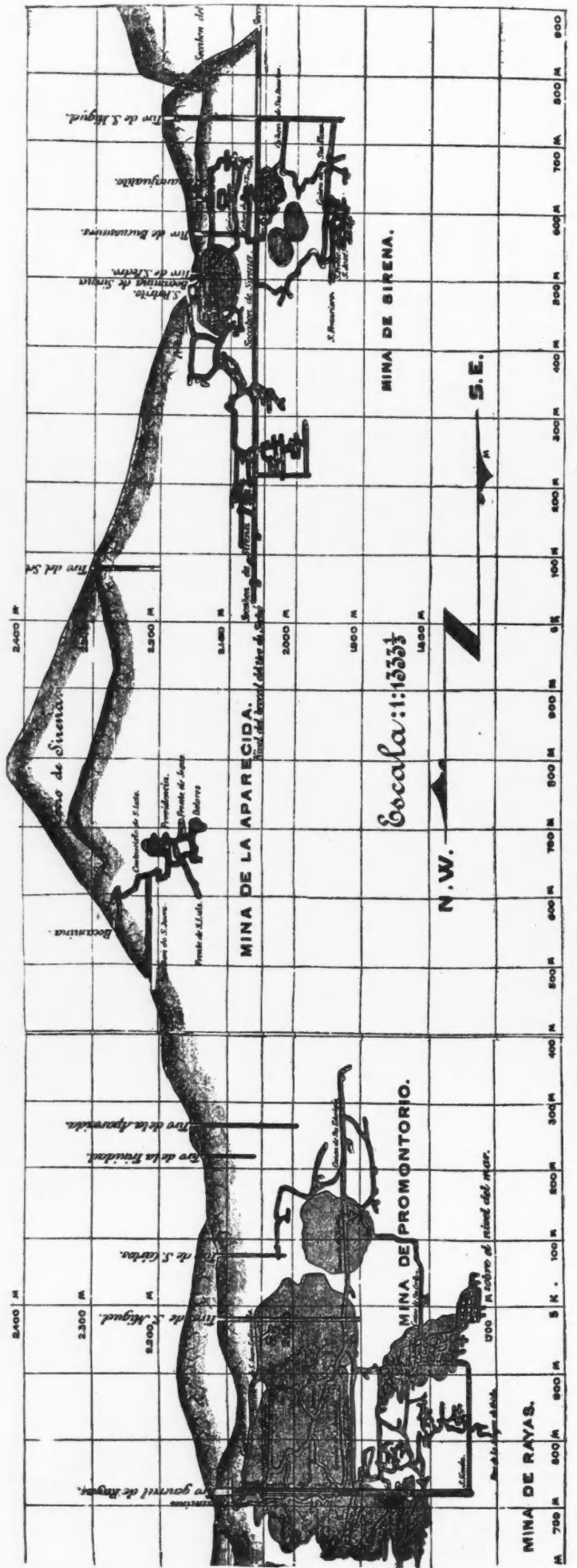
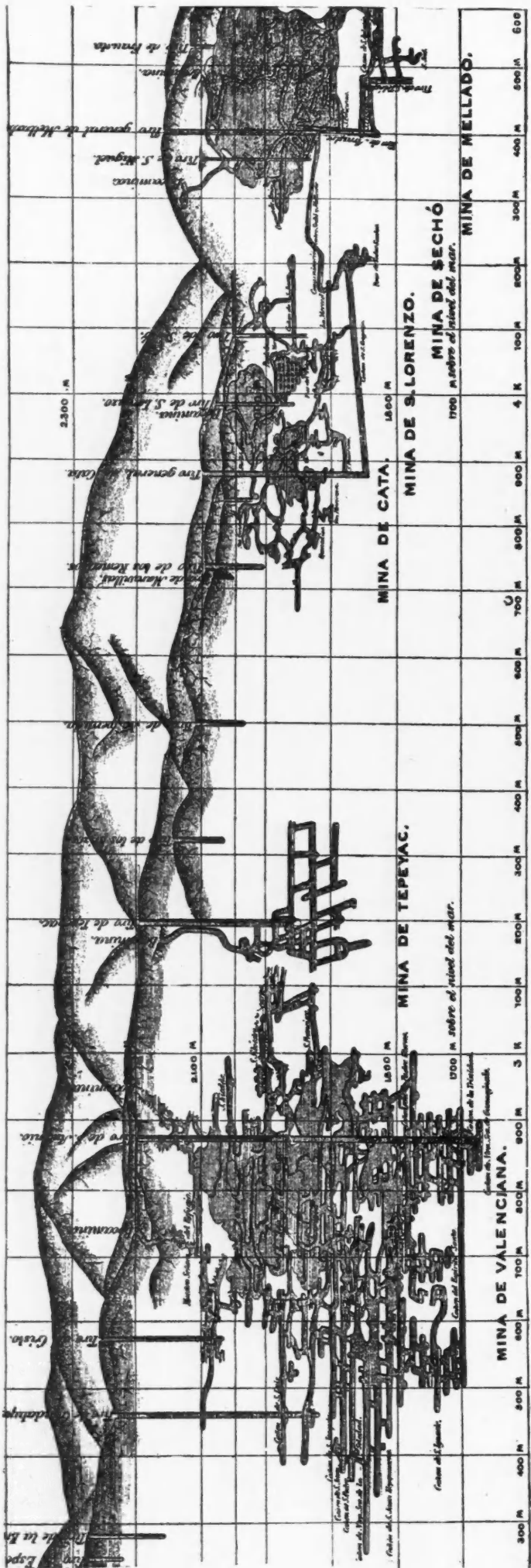
The town of Parral is in one of the oldest mining districts of the Republic, which comprises an area 8 miles wide and 25 miles long and includes Parral, Santa Barbara, and Minas Nuevas. The early history of the development of its mining is similar to that of Pachuca, Guanajuato, Zacatecas and other important mining centers. Operations were carried on in a very primitive manner and it was not until the advent of the Mexican Central Railroad a few years ago, which afforded the opportunity to handle the output, that the real value of the district was appreciated. Foreign capital and energy have been interested and many large bodies of excellent pay ore have been opened. It is only since the first of the present year that marked development has been made. In the Parral and Minas Nuevas districts the general formation is porphyry. The ores are siliceous carrying practically no lead, while in Santa Barbara the formation is composed of slate and shale, and the ores assay from 10 to 20 per cent lead in a quartz gangue. The most famous mine in the camp at the present time is Palmillo, which is now in bonanza, yielding probably about \$60,000 a month. The ores in the Parral district are treated by three leaching plants and one amalgamating plant, which with the new leaching plant, now under construc-

tion will bring the camp's mill output to 475 tons daily. The output of the Parral district in shipping ore during August, 1901, was 12,000 tons of ore which averaged about 35 ounces of silver per ton. A full description of the mining development of this important camp was published in the ENGINEERING AND MINING JOURNAL, Oct. 12, 1901. The recent activity in the mining district has been due to the completion of the Parral branch of the Mexican Central Railroad from Jiminez. The leaching of silver ore by sodium hyposulphite is practiced in many localities throughout the Republic. Perhaps the process can be seen to best advantage at Parral, where the Parral Mining Company have constructed a mill but a short distance from the railroad station, or at Minas Nuevas, where the Hidalgo Mining Company has installed a

leaching plant. The Parral plant was originally designed to handle 100 tons of ore daily, but the present actual working falls somewhat below this amount. The ore is broken and crushed by rolls and roasted with 10 per cent its weight of salt, which costs \$20 per ton (equalling \$2 per ton of ore roasted). At first a revolving cylindrical furnace was used but the large amount of zinc in the ore prevented successful working. At the present time a double hearth reverberating furnace is used. The roasting plant is supplemented with very large cooling floors which afford excellent results in the supplementary chloridization of the ore. A good power plant is adjacent to the leaching plant and is used to concentrate the ores, the tailings from the concentrators then being treated by the leaching process. As much of the ore is in a very fine state of division, the use of concentration before leaching may overcome the difficulties which are present in the treatment of ores of this physical character. At Santa Barbara there are three mills of 450 tons combined output and a new 350-ton mill has been recently completed. Besides these there are six private mills in full operation and in addition a smelting plant has been proposed. At present there are about 330 tons of ore shipped daily to outside smelters. The largest operators are the Hidalgo Mining Co. with six mines and two mills, the Parral Mines Ltd., with a 400-ton concentrator to treat the ores in the Santa Barbara district, the Guggenheim Exploration Co., with one 100-ton mill and an additional new one of 400 tons under contract, the Germania

gold—while an assay of a selected lot of ore yielded 183 ounces of silver and 3.4 ounces of gold. The Capuzaya and the Valadina mines also are of importance, the latter being next to the Baradon in the extent of its workings. In the Indé district, la Mina de Agua is one of the principal mines and yields an ore assaying about 40 per cent lead and from 50 to 200 ounces of silver per ton. The vein exists in narrow streaks which occasionally widen out into pockets. The ore is shipped by wagon to Jiminez, 90 miles distant.

El Oro is about five miles from Indé and close to the town is the noted deposit of pyrite and chalcocite carrying gold to the value of \$10 per ton. La Lustre Mining Company, of Pittsburg, Pa., have expended more than a million dollars in experimental work on this ore. At first the milling and amalgamation process was tried but the gold extracted was too small in amount to make it profitable; later, the chlorination process was adopted and yielded profits for the first six months, after which the cost of wood for roasting the ore previous to chlorination became so great (amounting to a monthly cost of \$30,000 Mexican currency) that it had to be abandoned. The cyanide process was then tried but there was too great a loss of cyanide from the large amount of base metal present to allow of profitable treatment. At present a pyritic smelter is being constructed, which will doubtless solve the difficult problem. The mine is fully developed and thoroughly equipped. The ore body averages 25 ft. in width and has been traced by outcrops for several



SECTION SHOWING THE PRINCIPAL MINES ON THE VETA MADRE (MOTHER LODE) OF QUANAJUATO.



miles. La Lustre Mining Company probably has more mining claims in Mexico than any other concern. Across the river from El Oro about two miles from the town is an attractive cinnabar deposit which with the application of modern methods of mining and treatment may be developed with profit. Near Guanceví is the copper camp of El Carmen containing the Jesus Maria and the Mina Grande mines. The former during 1900 shipped 2,132 tons of ore over the mountains by muleback to Parral, the product being sold to the Kansas City Smelting and Refining Company. The ore averaged 7.8 per cent copper and 144 ounces of silver per ton

establishments with the patio process as well. A few of the most progressive mines and mills are lighted with electricity produced by water power of which there is a considerable supply below the mills.

The mines reported in operation in the early part of the present year by Mr. Frank B. Fowler in the *ENGINEERING AND MINING JOURNAL*, March 16 and 23, 1901, together with the special mining camp in which they are situated are as follows:

El Toro and El Promontorio in the Canelas District, the latter mine having an immense mineral deposit 150 feet thick and of an average value from 20 to 30 ounces of silver per ton as well as a little

tains that fringe the western escarpment of the plateau of Mexico. The prevailing formation consists of various forms of porphyry and andesite with an occasional coursing of rhyolite. The ores are of copper, silver and gold; the principal value being in the gold which is found mostly in chalcopryite, while the silver is in tetrahedrite. One-third of the gold content is free and recoverable by amalgamation. The ores are crushed and concentrated, the concentrates smelted to copper matte or black copper and the ingots shipped to a refinery for subsequent separation of the precious metal content. The power for hoisting, pumping, running the mill, etc.,



ORE YARD AT THE SIRENA MINE, SHOWING THE MEN AND WOMEN SORTERS.

and yielded a net receipt per ton of \$73.15 United States currency.

Near the central part of the State close to the railroad are the districts of Avino and Cunejo which produce a low grade copper ore. The mines are now operated successfully although the output is not large.

The district of Topia, on the west slope of the Sierra Madre mountains is the most important of a number of mining camps clustered there within an area of 40 miles square. Its principal mine is the Liona, which yields a very rich ore. The vein is vertical and is tapped from both sides of the mountain with tunnels at right angles to the vein. At the point of intersection, the vein is driven on in both directions from the tunnels, slopes opened and ore chutes put in every 75 feet. The vertical distance between the tunnels is 125 meters. The stated capacity of the mine is 1,000 tons of clean galena a month. Another important mine in this district is the *Madugarda*. There are several mills at Topia for the treatment of zinky ores and dry ores of an assay value below 100 ounces of silver per ton. The leaching process by sodium hyposulphite is employed and is supplemented at some of the

gold; San Cayetano, Saunto, Santo Mino and Dulces Nombres in the Birimoa District, all yielding silver and gold; La Trinidad, Mina de la Plata and San Raphael in the Quaysimillas District. El Desague in the El Rodó District, with silver and lead ores closely resembling those of the Topia mines; La Candelaria and San Juan in the Chacala District, where the 4-ounce gold ore was treated by chlorination purchasing liquid chlorine from Germany, a process which has been lately changed to cyanidation. The recently discovered Fanny Mine, having an ore vein 40 inches wide carrying 25 per cent of copper and a little silver in the Tigre District; The Carmen Mine in the Carmen District yielding high grade shipping ore averaging 700 ounces of silver per ton and a little copper, the second class ore being treated by the patio process at the river 1,000 feet below; and others of less importance in the San José de Las Llanitos and San Bernabe districts.

Among the mines that have been equipped with modern machinery and operated by modern methods should be mentioned the San Fernando groups in the northwest corner of the State, 150 miles from the City of Durango. The lode outcrops 750 meters above the sea level and is on a spur of the moun-

is derived from the Humaya river operating six turbines and producing 600 horse power. The mill equipment comprises a Blake crusher, stamp mill, reverberatory roasting furnace, hydraulic classifiers, Wilfley concentrating tables and canvas tables for the slimes.

In the Copalquin District, 15 miles from San Fernando, the Copalquin Consolidated Mines Company, Ltd., operate several mines including the Refugio mine, which has yielded gold and silver estimated at more than \$1,000,000 in value since it was first opened in 1849.

H. van F. Furman, in a paper read before the Colorado Scientific Society, Jan. 6, 1900, describes the mines and smelting plant of *Compania Minera de Peñoles*, near Mapimi. The limestones surrounding the ore bodies are nearly horizontal to the eastward while to the westward they are badly faulted and twisted by a volcanic dike which intersects the formation. This volcanic intrusion antedated and had much to do with the deposition of the ore which is apparently a replacement of the limestone. The ores carry lead, silver, gold, arsenic, sulphur and occasionally copper. The Ojuela Mine, at the time of writing, was down 2,250 ft. below the surface.

The ores contain cerussite, anglesite, galena, bournonite and various oxidized iron, lead, antimony, arsenic and sulphur compounds, the arsenic and antimony components being quite considerable.

For the most part they are oxidized and generally occur with considerable galena. The smelting plant consists of 10 shaft furnaces of special construction to meet the requirements of the strongly basic bullion and the large amount of spies produced, the ordinary external crucible being replaced by an inclined interior hearth. The furnaces are 36x100 in. cross section at the tuyere level and have steel water-jackets. The hearth slopes to the front and a separate bullion tap is provided at the side of the furnace six inches below the level of the tap for matte and slag. This plant has been recently enlarged by the addition of two furnaces. To meet the requirements of the basic ore of the mines from 1,600 to 2,000 tons per month of siliceous ore is procured from Parral.

extent is not metalliferous. In this region the country grauwacke contains rich silver lodes which appear to be very similar to the Veta Madre. At Fresnillo the Cerro de Proaño is intersected at its foot by more than 50 silver bearing veins which occur in grauwacke or Devonian clay slate. The ores are of three classes, designated as *colorados*, *negros* and *azulaques*. *Los colorados*, the red ores, carrying chiefly native silver chloride or chlorobromide (*plata verde*) mixed with red iron oxides and quartz, rarely with remains of oxidized ores. These red ores mark the zone of decomposition influenced by the atmosphere and its waters, and occur to varying depths in the different veins. *Los negros*, the black ores, are essentially a quartzose veinstone carrying black sulphides of silver as argentite, stephanite, pyrargyrite, etc., with native silver and pyrite. *Los azulaques*, the bluish ores, are essentially peculiar to the Cerro de Proaño veins and consist of the same ores found in the adjacent veins but

in milling value from \$15 to \$45 per ton. Other mines yielding gold are San Cristobal a short distance southwest from the city, adjoining which is the San Luis del Oro group of a geological formation consisting of bluish or greyish schist merging into chloritic clay slate and traversed by dikes of diorite. The vein varies from six inches near the surface to 20 inches below and consists of layers of calcite and dark-colored slate rock which appears to be chloritic schist, impregnated with iron pyrites—the average assay in 1894 showed one ounce gold and 17 ounces silver per ton. The Castellanos mine contains a vein trending W. of N. and dipping E. 70° consisting of bluish quartz ribboned with silver sulphide and separated by bands and masses of calcite, average width of vein 2 feet 6 inches, of an assay value of about one ounce gold and ten ounces silver per ton. A little to the south of the mine is the Jesus del Pueblo vein which trends N. 30° W. through schist. The vein is four feet thick and con-

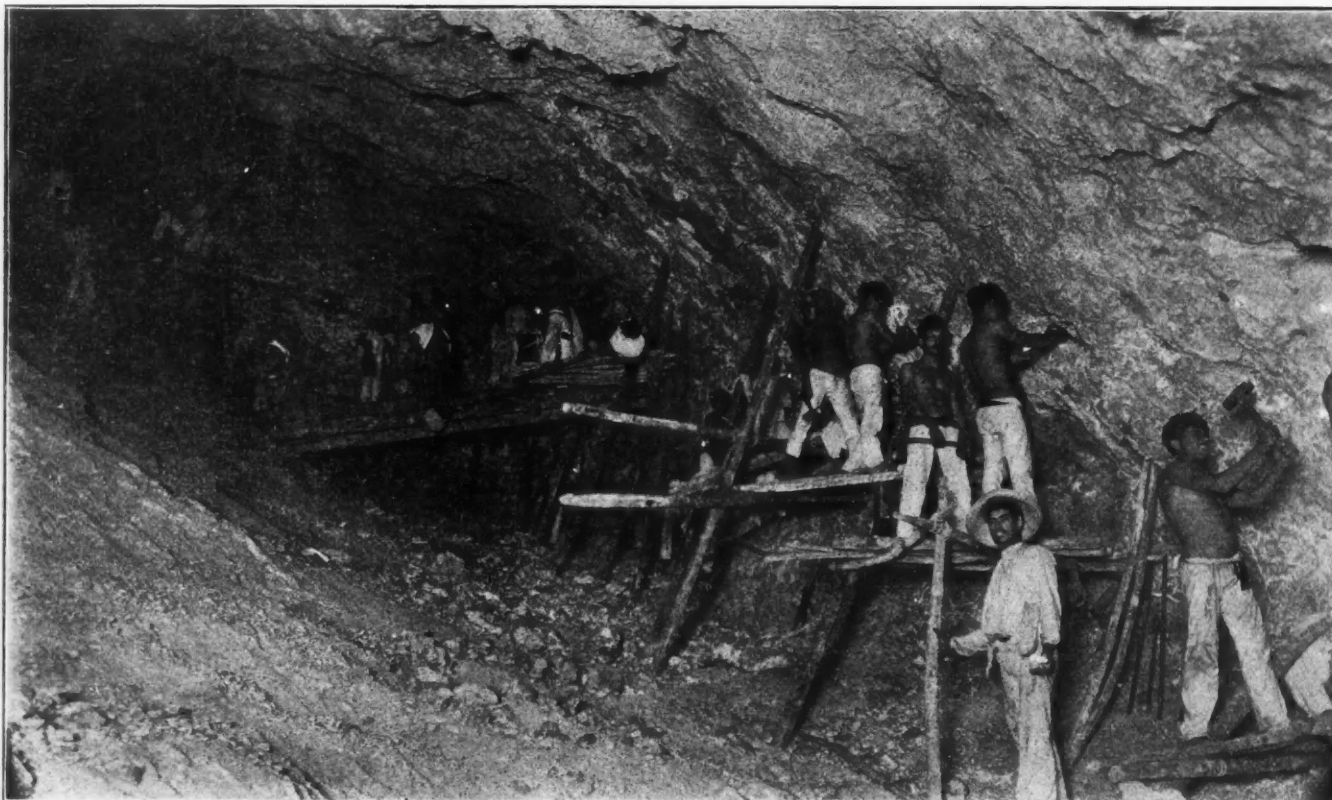


FIG. 5.—THE SANTA ANNA SLOPE, SIRENE MINE, ABOUT 1,200 FEET DEEP FROM APEX MEASURED ON THE PLAIN OF THE VEIN, 45°.

At Lerdo, the Velardiña Mining Company have a small smelting plant, consisting of three water-jacketed lead furnaces each of a cross section of 40x140 inches at the tuyere level. The plant has been in operation since November, 1893, and up to June 30, 1896, it had smelted 110,000 tons of ore yielding 9,070 tons of lead which contained 1,850,685 ounces of silver and 6,192 ounces of gold. It is still in operation.

At Torreon a new Mexican company capitalized at \$2,000,000 is erecting a plant of four furnaces of thoroughly modern type for the treatment of custom lead ores.

#### ZACATECAS.

The city of Zacatecas is located in what may be classed as one of the most important mining centers of the Republic, though in recent years the output of silver has considerably decreased. Many mines are in operation, the most important being the Veta Grande, Zacatecas, Pánuco, Fresnillo, Sombrerete and Chalchihuites. In the city there are several reduction works which treat the ores mainly by the old patio process of amalgamation. The Veta Grande vein is next in importance to the Veta Madre of Guanajuato, and mining commenced here in 1548. Its average width is from 25 to 30 feet and in some places it widens to 75 feet although the whole of the

distributed in the body of the country rock for a distance of from 16 to 32 inches beyond the lode—a distance to which the country rock has been impregnated by iron pyrites, argentite, horn silver and native silver in thin coatings.

The oldest explored gold vein in the State is La Veta de Dolores, 3.5 miles S. W. of the city of Zacatecas, where it appears to have been worked to a moderate depth only; the ore was probably carried down to some hacienda and treated by amalgamation. The famous Bote gold mine 22 miles from the city has been worked by foreign capitalists for a number of years and until 1894 or 1895 the ores were treated by the old patio process, at this date a 20 stamp mill operated by the Boss process was installed. The Australian mine was operated on this vein in 1894, and a 20 stamp mill erected. The vein trends N. 23° W. dipping E. from 80° to 85° in quartz or birds-eye porphyry and clay slate formations. The vein varies from 2 to 12 ft. in thickness and consists of quartz and calcite stained and ribboned by black sulphide of silver. The San Pascual mine has a 5 ft. vein near the surface which widens to 10 ft. at a lower level consisting of alternate bands of white calcite and quartz streaked and spotted with black sulphide of silver, the usual accompaniment of gold in this district. The ore varies

consists of solid bands of quartz stained and ribbed by black silver sulphide and separated by masses of calcite, the whole being colored red by iron oxides. The upper red or colorado stage of ore deposition averaged 1.39 ounces of gold and 9.20 ounces of silver per ton. The Santa Cristo vein adjacent to the above mentioned mine is the most important of this particular property. The working is done *à cheflan* i. e. making way in length and depth at the same time. The ore runs in gold content from 0.48 to 1.94 ounces per ton, while the silver is about 8 ounces. The gold appears free, often associated with "plata verde" and brown iron oxide, while the silver is a sulphide, probably stephanite. The gold-bearing zone of Zacatecas is cut off at the south by a mass of trachyte known as "La Mesa," while at the north the veins are mostly silver-bearing with no gold. Gold reappears in the Pánuco district 7 miles N. N. E. of the city of Zacatecas and in Mazapil as well—130 miles in the same direction. Sixty-eight miles S. W. of Zacatecas city is the gold-bearing district of Pinos and 80 miles S. S. W. is Juchipela, the largest gold-producing district in the State, while 35 miles further in the same direction is the Mezquital del Oro district with a ratio of gold to silver in the ore the same as that immediately south of Zacatecas City.

Edward Halse in the *ENGINEERING AND MINING JOURNAL* of Aug. 4, 1894, raises the question whether the gold belt does not extend from Mezquital del Oro in the south to Mazapil, 250 miles north with a lateral width of 100 miles from Zacatecas City to Pinos.

At Conception del Oro, the Mazapil Copper Company has three water-jacketed copper furnaces, one reverberatory roasting furnace and one Stallman converter. Three lead furnaces, 40x124 inches section at the tuyere level, were constructed also, but they are not in operation at present as the treatment of lead ores did not prove satisfactory.

topmost layer contains manganese as pyrolusite or psilomelane and forms the roasting ores called "quermazones," lower down the minerals are stained red by iron oxide forming the "colorados," while at the lowest stratum, the quartzose ore is admixed with silver sulphide giving it a bluish color, whence the name "pinta azul."

At the mining camp of Real del Monte, the Sierra de Pachuca is composed of variously colored porphyries, invariably forming the matrix of the ores, these never being found in the youngest eruptive rocks which have been forced through the porphyries. Stratified rocks do not occur in the neigh-

GUANAJUATO.

The State of Guanajuato lies at a mean elevation of about 6,000 ft. above the sea and nestled on the mountains is the capital, the city of Guanajuato, enclosing many haciendas for the treatment of ores from the famous mines in the vicinity. The city was founded by the Spaniards in 1554 shortly after the discovery of mineral in 1548, and in 1558 the famous deep shafts of the Mellado and Rayas mines were opened. It was through these immense octagonal shafts 40 ft. and 36 ft. diameter respectively, as well as through the later shaft of the Valenciana mine, that the renowned Veta Madre (mother lode)

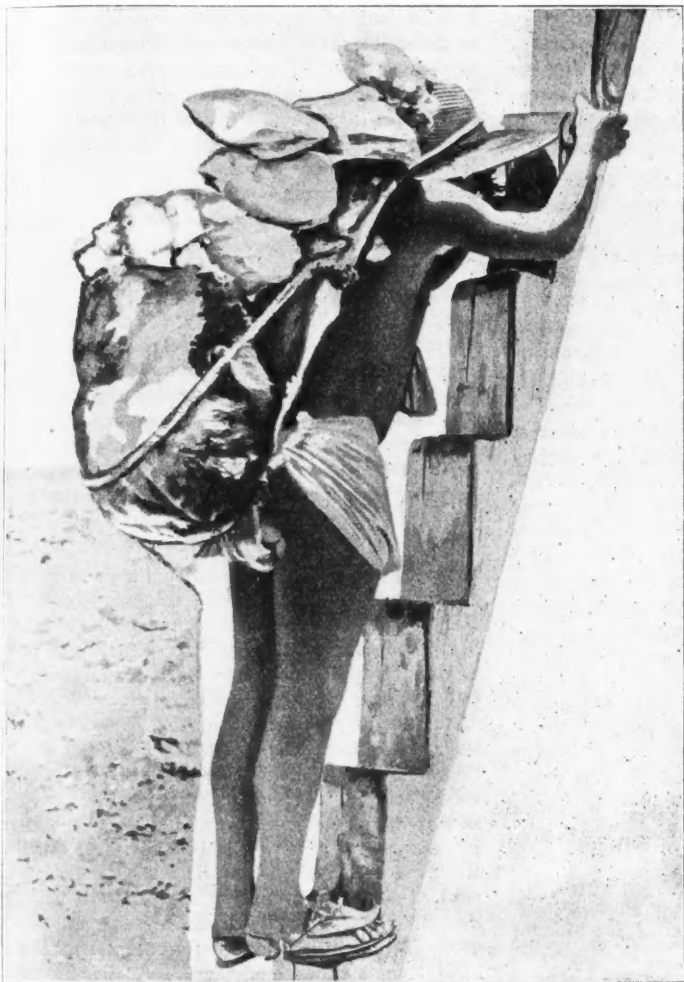


FIG. 6.—MEXICAN MINER. ORE PACKER CARRYING LOADS, WHICH VARY FROM 225 TO 350 LBS.

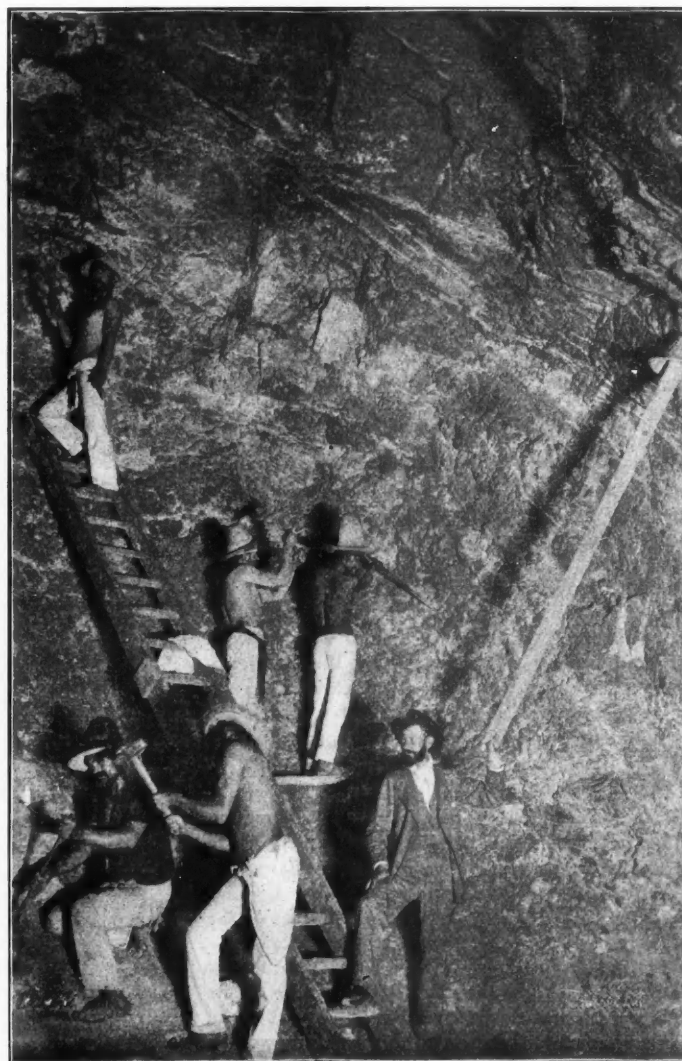


FIG. 7.—STRUCTURE OF THE VEIN AT THE 1,000-FT. LEVEL, SIERENE MINE.

HIDALGO.

There are nearly 300 mines near the City of Pachuca and in the adjacent districts of Real del Monte and Regla from which immense values have been produced; one mine alone, the Trinidad, having yielded \$40,000,000 in ten years, while others, the Rosario, Candado and Xacal, all on the Analcos vein, have contributed largely to the output of the Republic. This State is one of the oldest mining centers in the country, the mines having been worked for more than three and a half centuries. It was at Pachuca that the patio process of amalgamation was invented by Bartolomé de Medina in 1557 and the original *hacienda de beneficio* or reduction works may still be seen in the town. Mining operations are carried on in a crude and primitive manner, the ore being raised to the surface in rawhide sacks by means of ropes made from the fiber of the maguey passed around a horse or mule windlass.

The principal mines are at Pachuca, Real del Monte and Atotonilco el Chico in the Pachuca mountains and in the district of Zimalpan about 100 miles to the west of the town of Pachuca. In the Pachuca district the ore formation is very characteristic, the

borhood of either Pachuca or Real del Monte. There are numerous lodes coursing nearly East and West, which are generally parallel and dip 70° S. with an occasional exception dipping to the North. Cross lodes coursing North and South are rare and of no great thickness. The vein stone consists chiefly of quartz and decomposed porphyry, rarely with calcite or barite. Native silver and stephanite are common, while pyrargyrite, blende and copper pyrites are comparatively rare. The average percentage is from 0.15 to 0.18 of silver (43 to 52 ounces per ton), which contains 0.2 percent of gold. The widest lode is at Arevalo near El Chico and extends from 64 to 75 feet in width but contains much worthless material. The lode of greatest extent is the Veta Biscaina which may be traced 5,000 fathoms along its strike and is possibly connected with the Veta Madre of Guanajuato.

JALISCO.

The extension of the railroad from Guadalajara to Ameca has resulted in considerable activity in the silver mines of this district although the total output is comparatively small. Most of the ore is milled and treated in local works.

was reached. These shafts cost from one to two million dollars each and reached the vein at 2,000 ft. vertical depth or 3,000 ft. on the dip of the lode. The Rayas mine was the first recorded, followed shortly after by the Mellado, Cata, Sierena and in 1770 by the Valenciana, the greatest of all the mother lode mines. A sectional elevation of the principal mines on the Veta Madre is given in the full page illustration elsewhere in this article and a section of the Veta Madre vein showing the details of the formation is illustrated in Fig. 2. The geology of the district consists of a series of strong sedimentary strata, containing slaty schists, conglomerates of grauwacke, hornblende schist, serpentine, limestone and various porphyritic rocks which in turn are traversed by numerous eruptive rocks, syenic, basalt, diorite and trachyte predominating. A local rock, called "lozere," commonly occurs which is a feldspathic variety of fine grained stratified conglomerate. The strike (45 to 50° N. W.) and the dip (45° S. W.) conform with the bedding of the country rock and the deposit may be regarded as a bedded lode. The clay slates are probably of Devonian age while the conglomerate

beds belong to the New Red Sandstone period. In the Valenciana and Rayas mines the lode is most productive at the contact of these two rocks and has a width of 150 yards with from 90 to 120 yards of ore ground. The veinstone consists principally of amethystine quartz and calc spar, enclosing interstratified fragments of country rock. Gypsum, siderite, fluorspar, apophyllite and asbestos are the most common minerals present while barite is entirely absent. Curious interpolations of talcose rocks carrying silver, called "jabones" occur in the lodes of the Veta Madre as well as in those of La Luz and others. The metals and ores are native gold, native silver and argentite, with occasional stephanite, pyrrargyrite, tetrahedrite, galena and blende. Copper pyrites and iron pyrites frequently occur, the latter always carrying silver. In the Guanajuato lodes the ore is first found at a depth of 40 fathoms and at from 200 to 250 fathoms they became so rich in antimony and lead as to be no longer adapted to the amalgamation process.

The Veta Madre contains rich productive zones as ore shoots or chimneys of great persistence in depth alternating with poorer or barren sections. The ore bodies frequently occur from 10 to 30 ft. between walls and in the Valenciana Mine the pay mineralization of the lode reached a maximum of 400 feet in one section. Bodies of solid pay ore from 90 to 120 feet thick were mined while stopes from 25 to 35 feet across were not uncommon. Apart from the occasional very rich bonanza finds, the Guanajuato ores are of medium to low grade—ranging in silver content from 112 ounces at the Valenciana at the close of the 18th century to 50 ounces during the period 1860-1865 until the present time, when they average from 15 to 40 ounces per ton, not including the shipping ore which runs considerably higher. While reliable laws have not yet been formulated governing the distribution of values through the vein, Humboldt considered the probable occurrence of the richest zone to exist between 6,199 and 6,986 feet altitude above the sea level. Other writers have thought that below a certain depth galena ore occurs which will render the ore less suited for patio amalgamation although the tailings from the mills would then be well suited to mechanical concentration.

Until within a few years, the methods of mining and extracting ores in this district were very crude and inefficient. In fact, this condition of affairs may be said to have existed in practically all of the mining regions in Mexico. As shown in Fig. 6, the ores were carried to the surface on the backs of ore packers, who sometimes labored with a burden as great as 450 pounds, ascending the shaft by means of notched sticks which served as ladders. At the surface the ores were sorted by men and women into different lots (see Fig. 4.) and sent to the arrastra, furnace or leaching works. Only the very rich ore paid the high transportation charges to the smelters. Within the last few years, however, modern methods have been applied to the extraction and treatment of the ores and in this district the Sirena Mine has been equipped with electric hoists and pumps and the ore carried by tramway to the modern 60 stamp mill located at the Hacienda de San Francisco. Fig. 3 gives a detailed view of the Sirena Mountain, showing the plant of the Guanajuato Consolidated Mining & Milling Company to whose courtesy we are indebted for several of the photographs used for illustration. The location of the mine is at A; the tramway 1,400 ft. from the mine to the plant, is marked B; the Hacienda de San Francisco C; the power house D; the stamp mill E, and the ore bins F. Figs 5 and 7 illustrate the method of working at the Sirena Mine; the former is the Santa Anna stope 1,200 feet from the apex measured in the plane of the vein which is 45 degrees and the latter gives a view of the stope at the 1,000-foot level showing the structure of the vein formation.

The total production of gold and silver from this vein system, including the La Luz Mine and the Cardones District, is estimated at a value of \$1,500,000,000 (Mexican). At the present time ores run-

ning over \$40 silver value per ton (Mexican) are shipped to smelters out of the district. These ores carry gold also ranging in value from \$5 to \$13 per ton. The lower grade ore, from \$15 to \$30 value per ton, make up the great bulk of the product and are generally worked locally by the patio process in some 35 or 40 reduction works in and about the city, which are as a rule operated independently from the mines, the treatment charge being about \$18 per ton. The patio process extracts 90 per cent of the silver and from 30 to 35 per cent of the gold contained in the ore and occupies from three to six weeks' time. The replacement of the ancient and costly patio process by modern milling and amalgamation has reduced very materially the cost of treatment per ton. The company operating the Sirena Mine have installed a 60 stamp mill, with amalgamating pans, settlers, hydraulic classifiers and Wilfley and Frue Vanner concentrators and report a total saving of 85 percent of the precious metals. The concentrates vary in richness from \$100 to \$300 value per ton, and contain gold to the extent of from one-quarter to one-half the total value.

#### AGUAS CALIENTES.

This State contains the rich mineral districts of Asientos and Tepezala the former being celebrated in past years for the bonanzas of its mines of Descubridora, Santa Francisco, Romana, Santo Cristo, Cinco Señores and No Pensada. Its mountains are of a calcareous formation with porphyry on the summits and contain veins of silver in the form of sulphide, pyrrargyrite and chloride; besides galena and copper sulphide with occasionally double sulphides of copper and other metals. Near the City of Aguas Calientes is erected the smelting plant of the Guggenheim Smelting and Reduction Company now included in the American Smelting and Refining Company. The equipment consists of three thoroughly modernized water-jacketed lead furnaces 42x144 inches section at the tuyeres and five water-jacketed copper furnaces, two of which are 45x150 inches section at the tuyeres and the remaining three of 42x120 inches section. Each of the larger copper furnaces has a daily capacity of 250 tons of charge while the smaller ones can treat 150 tons in 24 hours. There are also three converters for the conversion of copper matte into blister copper. These converters are the largest in use at any copper smelting plant at the present time, being 8 feet diameter, 14 feet in height and producing three and a half tons of blister copper at a time. Their construction is fully described in Hixon's *Notes on Copper and Lead Smelting*. These converters are the only furnaces remaining of the original installation, the others having been remodelled and brought fully up to date or dismantled and replaced by more efficient ones. The present height of the smelting charge in the lead furnaces is 20 feet and the daily output of each furnace is 140 metric tons of charge. At the present time the works treat 30,000 metric tons of ore monthly, one half copper and one half lead. The base bullion produced, averaging about 300 ounces silver and a little gold, together with the converter bar copper, is shipped to Perth Amboy, N. J., and refined in bond. Including the argentiferous lead ore shipped to El Paso and smelted in bond, the American Smelting and Refining Company produces nearly if not quite half of the total lead output and about one quarter of the total silver output of the entire Republic of Mexico.

#### SAN LUIS POTOSÍ.

The principal mines adjacent to the City of San Luis Potosí are the San Pedro which have annually produced silver to the value of several millions of dollars. These mines were known to the Indians before the advent of the Spaniards and they contributed largely to the annual coinage of \$3,000,000 of the mint at San Luis Potosí. Catorce is the most important mining district in the State, the principal veins worked being La Purísima, San Augustin, San Jerónimo, San Ramon, Les Frailes and Maroma. The silver may be divided into three classes:—native silver in pebbles or plates, silver chloride or horn silver and silver sulphide and some of the

ore produced has assayed \$15,000 value per ton. Silver was discovered here in 1780 and, commencing 10 years later, the annual production for 30 years amounted to more than \$3,000,000. The San Augustin Mine has a drainage tunnel nearly 9,000 feet in length which was driven at a cost of \$1,500,000. The principal reduction works are near Matchuala and are operated by the La Paz Mining Company, Santa Fé Company, and the Catorce Concepcion Mining Company.

The vein formation at Guadalcázar has been classified by Ramírez into three systems. The Minas Viejas, to the east of the Cerro San Cristobal containing silver ores—the San Juan, northwest of this hill, containing argentiferous galena associated with tetrahedrite and other silver minerals and the San Juan to the south of the same hill, containing argentiferous galena and oxidized lead, minerals which form an excellent fluxing ore. Cinnabar also occurs at Guadalcázar at La Trinidad Mine, where it is associated with tetrahedrite. In the San Luis district, are the important silver mines of San Pedro and Bermejillo. Peñon Blanco is a prominent district on account of its valuable salt deposits which are extensively worked at the Laguna del Tapado, Concordia and Santo Domingo.

The San Luis Potosí Smelting plant of the Compañía Metalúrgica Mexicana is in active operation. The equipment comprises 10 modern water-jacketed lead furnaces, each 42x120 inches section at the tuyere level, and with a daily capacity of 100 tons each; 20 reverberatory roasting furnaces, each capable of roasting 7 to 10 tons of ore daily; and 2 blast furnaces for the treatment of mattes and copper ore, as well as reverberatory plant for the production of blister copper. This company is extensively engaged in mining, having mines at Sombretete, Sierra Mojada, Santa Barbara, Monterey, etc.

#### NUEVO LEÓN.

Among the more important mines in the vicinity of the city of Monterey are the San Pedro, San Pablo, San Antonio and the Aztec which produce a large output of low grade argentiferous galena of an average value of from 10 to 30 percent of lead, and from 20 to 30 ounces of silver per ton.

At Monterey the plant of the American Smelting and Refining Company locally known as the National Mexican Smelter consists of 10 modern water-jacketed lead furnaces 42x144 inches in section at the tuyere level, each of a capacity of treating 140 metric tons of charge daily. At the present time about 30,000 metric tons of charge are smelted a month, producing 2,500 tons of base bullion which averages 300 ounces of silver and a little gold. The plant is equipped for roasting with seven hand reverberators and three Bruckner cylinders, ten additional Bruckner cylinders being under construction. As a rule the use of mechanical furnaces for the roasting of lead ores is prohibited as the product, particularly if of high lead content, softens and agglomerates into a pasty, sticky mass, forming obstructions in the furnace and yielding a product that is more or less difficult to handle. Furthermore, by the agglomeration of the material, the roasting process ceases as the access of the air to each particle of ore is hindered. In lead roasting, furnaces of the Bruckner type have given fairly satisfactory results, especially if the percentage of lead in the charge be low. The great advantage of the mechanical type of furnace in reducing the labor cost is of particular application in Mexico where the labor is not of the highest order.

The equipment of the Compañía Minera Fundidora y Afinadora at Monterey consists of 8 steel water-jacketed blast furnaces 42x120 inches in section at the tuyere level with 6 tuyeres on a side, operated with a smelting column 12 ft. 2 in. from floor. One Pearce turret roasting furnace, 2 reverberatory roasting furnaces and 1 liquation furnace.

At this plant was erected the first Parks process lead refinery in Mexico of a daily capacity of 40 tons of base bullion. The equipment includes a Moebius electrolytic parting plant for the separation of gold and silver. It is a question whether

base bullion can be desilverized and refined with profit in Mexico except when the prevailing rate of exchange warrants the extra cost of fuel and labor involved.

#### COAHUILA.

Through the courtesy of Dr. R. W. Raymond, Secretary of the American Institute of Mining Engineers, advance proofs have been consulted of the paper on "The Sierra Mojada Ore Deposits," by James W. Malcomson, which will be read at the Mexico meeting of the Institute, November, 1901. The growth of the smelting industry in Mexico in recent years has been largely due to the output of the lead bearing ores of the Sierra Mojada mines and new smelters are now being built which rely on this district for their supply of lead ores. Previous to 1887 the mines were operated in a primitive manner but in that year the Kansas City Smelting and Refining Company acquired control of the two principal mines, the San Salvadore and the San José, and since then American capital and American methods have been very successfully employed in developing these mining properties.

Formerly when no duties were collected these ores were hauled by teams to Escalon and thence shipped to El Paso, Tex., or Argentine, Kas., but to-day as a result of the duties imposed in 1889 and 1896 a large part of the lead ores is treated in Mexico at the smelting works that have been established with American capital. That portion which is shipped to the United States is smelted in bond and the resultant product sold outside of the country.

The production of lead ores in 1900 from this district amounted to 187,110 metric tons of an average grade of 15 per cent of lead and 10 ounces of silver per ton. There is no gold in these ores. In all of the mines now open there are large bodies of mineral of low grade which in time, with lower freight and treatment charges will undoubtedly yield a profit. The Sierra Mojada mountains are of Carboniferous limestone of enormous thickness in this part of Mexico, the cliffs rising to 3,000 feet above the level of the plain. The alluvium or conglomerate strata forming the plain consists of boulders and pebbles of limestone cemented by calcareous material and is a product of erosion of the surrounding mountains. The ore deposits are fairly continuous, extending for a distance of 13,000 feet west to east, and may be divided into 3 groups:— (1) Contact deposits. (2) Lime impregnations. (3) Lead carbonate ores in limestone. A full description of the geology and of the mining condition of this district is given in Mr. Malcomson's paper referred to above, and will be reported in a later issue of the *ENGINEERING AND MINING JOURNAL*.

The progress of American enterprise is well illustrated in the rapid development of the Esperanza Coal Mines at Baroteran, by the Mexicc Coal and Coke Company. Since November 5, 1899, the time when the concession was obtained the work progressed so favorably that by December, 1900, the monthly output of coal amounted to 15,000 tons—a detailed description of the development of the colliery by Edward Ludlow was published in *THE ENGINEERING AND MINING JOURNAL* March 16, 1901, from which the following brief abstract has been prepared. The Mexican Coal and Coke Company control 22,000 acres of property which is reported to have shown by drill prospect a coal deposit of 50,000,000 tons. The coal is of the cretaceous period and is very regular in its formation. The seam is from 6 to 8 feet thick and lies at an angle of from 8 to 15 degrees. Three stopes have been sunk to an average distance of 1,500 feet and two modern tipples, each of 3,000 tons capacity together with a 1,200-ton Campbell washer, having 26 dumping tables, have been erected. Ten miles of standard gauge track have been laid down, which connects the mines with the Mexican International Railway at Baroteran. Coal shipments began in June, 1900, and the output reached 15,000 tons in December of the same year. Fifty coke ovens are in operation and an additional fifty are being constructed. An analysis of the coal showed fixed carbon 67.7 per cent., volatile matter 20.5 per cent., ash

9.8 per cent. and moisture 2 per cent. From the unwashed coal a yield of 60 per cent coke was obtained, which analyzed fixed carbon 87.4 per cent, volatile matter 0.8 per cent., ash 14.7 and water 0.5 per cent. By washing the coal before coking it is expected to reduce the ash to about 8 or 9 per cent. The company expects to develop the field to an output of 5,000 or 6,000 tons daily, and as an instance of the progressiveness of this company should be mentioned the use of coal cutting machines in the mines, the economy in labor cost thereby gained being considerable, as skilled workmen cannot be easily or readily obtained.

#### OPENING FOR AMERICAN COAL IN BRAZIL

Consul-General Seeger, at Rio de Janeiro, states that the Brazilian Government probably wants 60,000 tons of hard coal, to be delivered during the six months beginning January 1st, 1902. Mr. Seeger sends also a letter from a prominent Brazilian merchant, who states that United States coal met with great opposition as soon as it appeared in the Rio de Janeiro market, because it threatened to disturb the Cardiff coal business.

It is well known that American coal is cheaper than Cardiff, and consequently there is great opposition on the part of the dealers in the latter, who have declared the American product to be of bad quality.

The American coal brought into Brazil is in the hands of importers who do not put it on the market in competition with Cardiff. No one is interested in making a propoganda for it or in trying to convince the consumer that it is as good as Cardiff.

Under these circumstances, if the American mine-owners want to get a part of the coal business in Rio de Janeiro, they must decide to establish an agency in Rio with the means necessary for the development of the business.

#### NOTE ON THE OCCURENCE OF COBALTFEROUS QUARTZ IN THE STATE OF JALISCO, MEXICO

By FREDERIC CHISHOLM.

In spite of the fact that in the western portion of the State of Jalisco and in the adjoining parts of Zacatecas, Michoacan and Tepic Territory, there are numberless metalliferous veins and deposits, and that the general mineralization is very extensive, there is, so far as known, but little variety in the minerals found, the metals present being generally—besides gold and silver—lead, copper, zinc, iron and manganese, in simple and uninteresting combinations, usually as sulphides, except where superficially oxidized. Striking or showy specimens are extremely rare, and an attempt to make an attractive looking collection is practically hopeless.

To this general condition however there are a few noteworthy exceptions, such as the occurrence in quantity of a telluride of silver at San Sebastian, and of a body of cobalt ore in the Mirador Mine near Amecca, both in Jalisco. The former has been known and the vein worked for a number of years, but the latter has been but recently identified, and presents some interesting features.

Some time since, the owner of the Mirador Mine, Don José Somellera, of Guadalajara, while making some assays of the wall rock of his vein noticed that the scorifiers were colored a strong blue. Repeating the test he obtained the same result, and suspecting the presence of cobalt, brought a few pieces of the rock to Guadalajara and delivered them to an assayer there, simply as a matter of interest, the material containing only a trace of silver.

Physically, the rock is a blue quartz, very hard and tough, showing some minute crystals of pyrite, and would not attract attention in any way. A number of analyses were made of different specimens, showing it to contain about 98 per cent silica, from 0.42 to 0.55 per cent of cobalt and from 0.40 to 0.50 per cent of iron, the cobalt and iron being combined with sulphur, but apparently not associated with each other.

Rough tests showed that by washing with 0.5 per cent of salt and leaching the roasted ore with hot

water practically all the cobalt was obtained in the solution, from which it may be separated by precipitation by sodium or ammonium sulphide. In this form cobalt is worth from 90 cents to \$1 per pound, so that taking the higher price and assuming an extraction of 95 per cent, the gross value of the product would be about \$9.50 per ton of ore, or say \$19, Mexican currency. With a large and proved body of ore and an unlimited market ore of this grade could be worked at a profit, but the fact that a large production of cobalt would quickly reduce its value has prevented any attempt at working the ore here, so that the extent of the deposit is unknown. The ore of the Mirador vein is a white quartz carrying small quantities of auriferous copper sulphides, without a trace of cobalt, and it is rather singular that the attached wall-rock, while containing cobalt, shows no trace of copper nor of gold. No nickel can be detected in the cobalt ore.

As the gold quartz of the Mirador vein is too low in gold to pay, prospecting has been stopped and the claim will probably be abandoned by the owner without any attempt to explore the cobaltiferous wall rock.

**COAL PRODUCTION IN GERMANY.**—The production of coal in Germany for the seven months ending July 31 is reported by the *Deutsche Kohlen Zeitung* at 62,409,122 metric tons of coal, and 24,948,871 tons brown coal or lignite; a total of 87,357,993 tons. The production of coke for the same period was 5,494,376 tons, and of briquettes 5,229,701 tons.

**COAL IN THE SOUTH OF ENGLAND.**—The London "Colliery Guardian" reports that an Anglo-French Syndicate has quietly acquired mining options over a large area immediately to the north of Dover, in England, extending from the south boundary of the Kent Colliery limits across the Alkham Valley in the direction of Canterbury. Plant is being erected in the Alkham Valley, and boring for iron and coal is to commence immediately.

**X-RAY PRODUCTION.**—According to the London *Engineer* recent experiments show that Roentgen rays may be produced directly in air, and outside the Crookes vacuum. M. A. Rodon finds that they are produced under the simultaneous action of ultra-violet rays and of an electric field. If an electric field is set up between the plates of an air condenser and a pencil of ultra-violet rays is directed on to one of the plates, Roentgen rays are produced. These rays are propagated along the same direction as the lines of electric force of the field. They are not emitted in other directions. They possess greater activity when the direction of the lines of force of the field is the same as that of the propagation of the ultra-violet radiation, that is, when the illuminated plate of the condenser is the negative one.

**COAL TRADE OF INDIA.**—In recent years the industry has grown noticeably. Production has increased from 2,650,000 tons in 1895, to 6,095,428 tons in 1900, which is equal to 56.5 per cent, in six years, thus placing India among the more prominent coal countries in the far East. It is also noteworthy that of last year's output the Indian railways consumed 1,855,610 tons, or 30 per cent, a decided increase over previous years. On the other hand, the imports of coal into India have fallen off to a marked degree, being only 83,236 tons in 1900, as against 758,799 tons in the fiscal year 1895-96. Most of these imports were Welsh, though some Japanese coal arrived in Bombay on the establishment of the Nippon Yusen Kaisha's Bombay-Yokohama service. In India the leading producing districts in 1900 were Bengal, which furnished 4,954,965 tons, or 81 per cent, and Hyderabad (Deccan), 469,291 tons, while smaller quantities came from Assam, the Central Provinces, Central India, the Punjab, Beluchistan, Burma, and Bikaner. There are also other promising fields that will likely be developed on completion of the projected railway facilities.

RECENT DECISIONS AFFECTING THE MINING  
INDUSTRY*Specially Reported*

**OVERLAPPING CLAIMS.**—For the purpose of locating a mining claim with parallel lines, parts of the lines may be within another claim, though within the overlaps the rights of the other claim prevail. The senior claim having within its surface a part of the width of the apex, owns the entire width of the ledge.—Bunker Hill & Sullivan Mining and Concentrating Company v. Empire State Idaho Mining and Developing Company (106 Federal Reporter, 471); United States Circuit Court, District of Idaho.

**WHEN INJUNCTION WILL BE GRANTED PENDING SUIT.**—Where in an action by the owners of a mining claim to restrain the removal of ore from same by one who owned the adjoining claim, and had entered by underground workings, there was much evidence that the apex of the vein was in the latter claim, but there was some evidence to the contrary, and the development had not progressed far enough to identify the vein in the latter claim with that in the former, nor to show with certainty the location of the apex of the vein in controversy, the evidence will authorize an injunction pendente lite. In such an action the burden was on the defendant to show that the vein they were working had an apex in their own claim.—Maloney v. King (64 Pacific Reporter, 351); Supreme Court of Montana.

**ABANDONMENT; LOCAL REGULATIONS AND THE GENERAL LAW.**—Under the Revised Statutes of the United States, section 2,324, authorizing the miners of any district to establish regulations as to the amount of assessment work necessary to hold possession of a claim, but requiring the work to be of the value of \$100 a year, and providing that a failure to do such work shall work an abandonment, compliance with local regulations providing that an improvement of a certain description shall be sufficient will not prevent an abandonment, when the value of the work is less than \$100. One who owned four claims employed G. to perform the assessment work for a year, and paid him \$400 for same, the latter constructed a shaft on each of the claims larger than that required by the local regulation. G and other witnesses testified that such work was worth \$100 a claim. Evidence of the contestant was to the effect that the expenses for help and necessary supplies, etc., could not have reached \$100 a claim, but no bad faith was shown, and the remoteness of the mines entailed extra expense. It was held that there was sufficient evidence to sustain the claim that the assessment work to the extent of \$100 a claim had been performed.—Wright v. Killiam (64 Pacific Reporter, 98); Supreme Court of California.

**RIGHTS IN MINING CLAIMS WHEN LINES CROSS.**—Revised Statutes of the United States, Section 2,322, declares that locators of mining claims shall have the right to any vein whose apex lies within their location throughout its entire depth, though on its dip it extends beyond the side lines of the location, but that the right to the portion outside such lines shall be confined to the portion between vertical planes extended downward from the end lines or with the continuations of same, and other provisions of the chapter speak of "lands valuable for minerals" being reserved from sale, and that lands in which deposits are found are open to occupation. The court held that the apex of a vein was in the location of another party, but he had no right to follow it beyond the vertical plane of its south line, owing to such line being an end line; the locator that was situated south of the other's, and who had not the apex of a vein within the exterior boundaries of his claim, was entitled as against the other to the ores beneath the surface, since it being land that is granted under the statute, he was entitled to the ores beneath the surface, by common-law right. And that where two opposite side lines of a mining claim were crossed by

the vein in its course they thereby became in fact end lines, and hence the locator had no extra-lateral rights without the vertical planes extended downward in the direction of the original side lines. Also, where the apex of a vein passes through one of the parallel end lines and a side line, the extra-lateral rights of the locator are bounded by the vertical plane of such end line and a parallel plane extended downward through the point where the apex crosses the side line.—Parrot Silver and Copper Company v. Heinze (64 Pacific Reporter, 326); Supreme Court of Montana.

## ABSTRACT OF OFFICIAL REPORTS

*Crucible Steel Company of America*

This company is the consolidation of a number of manufacturers of crucible and tool steel. Its report covers the year ending August 31, 1901. The capital stock includes \$25,000,000 in 7 per cent. preferred stock and \$25,000,000 in common stock. The company has also \$183,100 in bonds outstanding.

The profit and loss account for the year is as follows:

Net earnings from operation.....	\$3,490,438
Dividends received .....	30,861
<b>Total .....</b>	<b>\$3,521,299</b>
Dividends, preferred stock.....	\$1,750,000
Dividends Park Steel Co., outside holders	40,341
	<hr/>
	1,790,341
<b>Surplus for the year.....</b>	<b>\$1,730,958</b>
Balance from previous year.....	173,154
	<hr/>
<b>Surplus to current year.....</b>	<b>\$1,904,112</b>

In his report to the stockholders President Holcomb says: "The results of the past year show net earnings of \$3,490,438, which is very satisfactory. It is true that the profits of the various companies the year before the merger into the Crucible Steel Company of America aggregated about \$4,000,000, but these profits were made during an abnormal year, in which the volume of business was larger and the prices higher than they had ever been or have been since, and the inventories of these companies at the time or merger were taken at the then ruling prices, which declined very materially within less than one month after the date of merger. In addition to this your company was very heavily handicapped by having to assume contracts for large amounts of raw material at high prices, for which the various companies had obligated themselves and which your company had to assume and carry out. Your company started in last year with very few orders on hand and comparatively no contracts, because the different constituent companies had made no effort to book orders or make contracts in view of the fact that a consolidation was probable. We have started in this year with a very large tonnage of orders booked and contracts sufficient to run us for at least two-thirds of the year.

"We have, during the past year, effected many economies in the operating and selling departments, which will show a considerable saving in the expenses this year. Your company has, within the past year, purchased 175 acres of the finest manufacturing land on the Monongahela River, and has organized the St. Clair Furnace Company and the St. Clair Steel Company, of which it owns all the stock, and has commenced the erection of three large blast furnaces, twelve 50-ton open-hearth furnaces and blooming mill, all of which will be in operation within the next few months and will constitute the most modern furnace and steel works in the world. This plant will make us absolutely independent as regards raw material of all kinds, besides reducing our cost of manufacture to a minimum. I have recommended to the board of directors that \$490,438 should be deducted from the net earnings for depreciation, which suggestion they have adopted, and have carried to surplus account \$1,250,000, which is the balance after allowing for the 7 per cent dividend already paid and declared on the preferred stock, amounting to \$1,750,000 (making the total surplus account \$1,413,673), believing that while the company

had earned about 7 per cent on the common stock in addition to 7 per cent on the preferred, it was not expedient to declare any dividend on the common stock this year."

*Anglo-Sicilian Sulphur Company,  
Limited.*

This English corporation is the trust or combination which controls the sulphur mines of Sicily, and consequently a large share of the world's supply of sulphur. The report is for the year ending July 31, 1901. The authorized capital stock is £1,035,000; the stock account shows 700,000 preference shares of £1 each, 189,000 of which are fully paid up, making £189,000; and 511,000 shares, with 15s. called up and paid, making £383,250. There are also 700,000 ordinary shares of 1s. each, making £35,000. This makes the total capitalization £607,250. The stocks of sulphur on hand at the close of the year are reported to have cost £482,422.

The report of the council in London says: "The Sicilian assets have been converted into sterling at the rate of 27 lire to £1 sterling, the amount at credit of exchange reserve account being now £5,594. The gross profits on the year's trading have amounted to £137,670, to which must be added interest on temporary investments and other receipts bringing the total gross profits to £145,671. After deducting working expenses and other items, including a further sum of £8,500 placed to the reserve for doubtful debts, there remains a net profit of £106,644. The reserve against any eventual depreciation of stocks of sulphur stands at £36,529. Out of the said net profit of £106,644 an interim dividend of 3 per cent (on the amount paid up per share) on the preference shares for the six months of January 31, 1901, was paid in March last, absorbing £17,167 (less income tax), and it is now proposed to pay a further dividend for the second half of the year of 3 per cent. (on the amount per share paid up) on these shares, amounting to £17,162 (less income tax), making a total distribution on the preference shares of £34,335, being 6 per cent for the year, as provided by the articles of association. Of the balance, 20 per cent, or £14,462, has been credited to the capital guarantee fund, which now amounts to £52,375.

"A sum of £36,403 has been credited to the general reserve fund, which now stands at £119,245, making with the capital guarantee fund as above a reserve of £171,620, besides the reserve against any eventual depreciation of stocks of sulphur already referred to of £36,529. After reserving £2,000 for income tax the remainder is divisible as follows: One-tenth to the preference shareholders, which, with £120 standing to their credit from last year, will admit of a further distribution on this class of shares, in addition to the 6 per cent as above, of 0.66d. per share on the fully-paid shares, and 0.5 per share on the shares on which 15s. has been paid, carrying forward £475. Nine-tenths to the ordinary shares, or £17,500, being a dividend of 6d. per share, or 50 per cent on each ordinary share.

"A circular was issued to the shareholders on January 26, 1901, informing them that the directors, in view of the excellent results achieved since the inception of the company, and availing themselves of the powers vested in them by the shareholders, had decided to renew the contracts with the Sicilian sulphur producers for a further period of five years from July 31, 1901, and that the necessary notices to effect such renewal had been given to the producers."

**MINERAL PRODUCTION IN ITALY.**—The production of coal (including lignite) in Italy in 1900 was 479,896 tons, valued at 3,542,355 lire, as against 388,534 tons, valued at 2,759,219 lire in 1899. The mines at work numbered forty-four, as against thirty, and the 3,683 miners were employed as against 3,064. The production of iron ore was 247,278 tons valued at 4,585,522 lire, as against 236,549 tons valued at 3,534,117 lire in 1899.

BOOKS RECEIVED

In sending books for notices, will publishers, for their own sake and for that of book buyers, give the retail price? These notices do not supersede review in a subsequent issue of the Journal.

*Handbook on Sanitation; A Manual of Theoretical and Practical Sanitation.* By George M. Price, M. D. New York; John Wiley & Sons. London; Chapman & Hall, Limited. Pages, 330; illustrated. Price, \$1.50.

*Geological Map of West Virginia.* Second edition. Compiled by Russell L. Morris and I. C. White, Morgantown, W. Va.; published by the State Geological Survey. One sheet, scale 10 miles to 1 inch. Price, 50 cents.

*Preliminary Report on the Copper Bearing Rocks of Douglas County, Wisconsin.* Second edition. Being Bulletin No. 6 of the Wisconsin Geological Survey. By Ulysses Sherman Grant. Madison, Wis.; published by the State. Pages, 84; with maps and illustrations.

*Revista del Servizio Minerario d'Italia nel 1900.* Prepared by the Mining Division of the Ministry of Agriculture, Industry and Commerce. Rome, Italy; National Printing Office. Pages, 420; with tables and diagrams.

NEW PUBLICATIONS

*Mines and Mining in Eastern Ontario.* By Rendol Snell. Toronto, Ont.; Murray Publishing Company. Pages, 48; illustrated.

This pamphlet is devoted chiefly to the gold and arsenic mines and mills of Hastings County, in which a good deal of work is now going on. It describes all the active mines, and gives several illustrations of mills, etc. In addition to this, there are notes on the iron ore deposits of the North Hastings District, which may be hereafter of much importance. The new operations of the Canada Corundum Company, and there are also references to mica. The general features of the section are also described. The facts are presented in a popular rather than a technical way, the object being to draw attention to the possibilities of the region in the way of industrial development.

*Report on the Mining Industry of Natal for the Year 1900.* C. J. Gray, Commissioner of Mines. Pietermaritzburg, Natal; Government Printers, Pages, 80; with maps and diagrams.

The mining industry of Natal is confined chiefly to coal, which is an important product of the colony. In addition to this, however, there is some gold mining, chiefly the working of placers. The coal of Natal is of better quality than any yet found elsewhere in South Africa. It is excellent fuel for steamships, and this has added considerably to the commerce of the port of Durban, which is the chief outlet for the coal districts. In 1900 the production of coal was seriously interfered with by the Boer war. Some of the larger collieries were closed altogether, and others showed a restricted output on account of the military operations; while the gold mining operations were entirely suspended. The report gives full details regarding the existing mines, and also concerning trial borings for new deposits.

*Report of the Bureau of Mines of the Department of Internal Affairs of Pennsylvania.* 1900, James E. Roderick, Chief of Bureau of Mines, Harrisburg, Pa.; State Printer. Pages, 826; illustrated.

This report covers the year of greatest coal production in the history of the State, and presents some special points of interest. The first section, 74 pages, of the report is taken up by Mr. Roderick's summary of the coal mining conditions of the year. This includes the general statistics of production, reports of accidents and similar information; most of which has already been published in the ENGINEERING AND MINING JOURNAL from advance sheets. The production of anthracite coal was somewhat less in 1900

than in 1899, owing to the strike of the miners; but that of bituminous coal increased, making the total output 130,535,680 tons. The section on accidents, following that on production, contains much that is of interest. Mr. Roderick adds a brief history of the anthracite miners' strike, with some suggestions on arbitration in labor disputes, which are timely.

Following the general introduction is the mining law of the State as it now stands. The remaining part of the book is taken up by the detailed reports of the mining inspectors of the several districts. There are eight of these in the anthracite region, and ten in the bituminous fields; and they contain much information with regard to accidents and to the mines and mining conditions in the various sections of Pennsylvania.

*Etude Complete du Bassin Ferrifere de Briey et de la Formation Ferrugineuse Lorraine.* By Francis Laur. Paris, France; Societe des Publications Scientifiques et Industrielles. Pages, 96; with map and illustrations.

Probably the most important occurrence in recent years for the iron and steel industries of France was the discovery that the great Minette ore deposits of Lorraine and Luxemburg were continued in the basin of Briey, on the French side of the boundary line. Extensive explorations by boring and otherwise have been made, from which M. Laur estimates that in this basin and within the range of possible mining there are no less than 2,500,000,000 tons of iron ore. This seems a sanguine view, and it is possible that large deductions may have to be made when the deposits are more fully explored. Nevertheless the fact remains that the metallurgical industries of France have a new and very extensive supply of iron ores in their own country, which will preclude for many years the necessity of importing ores from other countries.

The Briey ores are similar in most respects to the Minette or oolitic iron ores of the Lorraine basin. The ores run, so far as known, from 35 to 45 per cent metallic iron, and from 0.75 to 1 per cent phosphorus. M. Laur, with his usual optimism, predicts great results for the future of the French iron industry, and to a certain extent his anticipations are probably correct; though a less enthusiastic observer from the outside will make some discount from his figures.

Apart from this he has given us a careful study of these important ore deposits, and has included in it a general description of the iron ores of Lorraine. He includes also lists of concessions granted by the French Government for the working of iron ores. A geological map accompanies the book, and there are many sections of borings.

CORRESPONDENCE

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

Analyzing Low Grade Silver Ore.

Sir: In your reply to W. E. U.'s question on the above subject you forgot to warn him not to have his solution too strongly acid; also that sodium chloride is better to use as a precipitant than hydrochloric acid. The method I always use is as follows:

Take from 100 to 300 grams of ore, according to its richness, and treat with sufficient dilute nitric acid (1 part acid to 1 part water) to dissolve it, avoiding undue excess of acid. Boil until all action ceases, then add excess of a solution of sodium chloride (a normal salt solution is convenient, i.e., 58.5 grams NaCl in a liter of water). This will precipitate all the silver as AgCl, and on continued boiling the milkiness coagulates and the precipitate settles, but there is always danger of loss in filtering small precipitates, so a lead salt is added, such as lead-nitrate or acetate and sufficient sulphuric acid to precipitate the lead as PbSO<sub>4</sub>, which heavy

precipitate carries down with it every trace of silver chloride which may be floating about in suspension, and a clear solution of copper and iron salts is obtained on allowing to settle. This can be decanted or siphoned off and the residue containing silver chloride, lead sulphate, gold and insoluble gangue is washed with hot water by decantation, and finally on filter paper, then dried in air bath, and when dry it is treated as if assaying for lead in the dry way, and the resulting button of lead is cupelled for silver and the silver button parted for gold in the ordinary manner.

This is the method I used for mattes, and as they contained lead it was unnecessary for me to add any lead salts.

This method of weighing the silver as metallic silver instead of silver chloride (as W. E. U. seems to want to do) is the only reliable and practical way, as it is extremely difficult to weigh such small amounts of silver chloride and get concordant results. In W. E. U.'s ore, 10 A. T.'s would only give him a precipitate weighing about 93 milligrammes of silver chloride.

I think it is much better to get rid of the copper in the wet way than by the dry way of repeated scorification.

HENRY WATSON.

Niagara Falls, Octo. 14, 1901.

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. Preferences will, of course, always be given to questions submitted by subscribers. Books referred to in this column can be obtained from the Book Department of the ENGINEERING AND MINING JOURNAL.)

*Purchase of Mining Stocks.*—To whom would you direct me to inquire concerning the purchase of mining stocks?—C. M. H.

*Answer.*—We cannot give any advice in relation to buying or selling mining stocks. Any reputable broker will buy or sell such stocks for you. One in Boston would probably be the most convenient for you, and there are a number in that city. If you wish to be posted on the merits of mines or mining districts, you should read the ENGINEERING AND MINING JOURNAL regularly.

*Vanadium.*—Where is vanadium found in the United States? What is its value as an ingredient in iron ore? What proportion would materially increase the value of an iron ore and how much.—C. A.

*Answer.*—Vanadium in the United States is found chiefly in San Miguel and Montrose counties in Colorado. A small quantity has been mined there which seems to be quite sufficient for the commercial demand. Formerly the supply came from the ashes of certain coals used in the steel works at Creusot, in France. The discovery of the ores in Colorado reduced the price considerably.

With regard to iron, vanadium has been used as an alloy in making steel and iron. It has been found that the addition of vanadium increases the tensile strength and malleability of iron and steel. A very small proportion is used, 0.5 to 1 per cent being the usual proportion. Its use, however, has been chiefly experimental as yet, and vanadium still is not yet made in large quantities or as a commercial product on a considerable scale.

While vanadium has lately been found to occur in certain iron ores, its effect on iron ores in the blast furnace has not been studied, and practically nothing is known about it. Consequently no standards have been established, and it is impossible to say whether the known presence of vanadium would add to the value of an ore, or detract from it. Further experiments are needed to give us information on this point. Ferro-vanadium has been made in Great Britain by the Baxeres' method. Experiments have

been made at the Krupp Works, in Essen, Germany; at the Creusot Works in France, and the Armstrong Works in England, but the results have not been made public; probably they are not complete as yet.

**Manganese in Iron Ore.**—At what point does the proportion of manganese found in iron ore cease to be a deterrent quality? And about what is the value per unit of the increase above that point?—C. A.

**Answer.**—Manganese ores—or rather manganiferous iron ores—carrying as low as 7 per cent manganese are used in making spiegeleisen. That would seem to be about the point where the manganese becomes an appreciable element in the value of the ore. Just where an ore ceases to be considered a manganiferous iron ore, and is a manganese ore properly speaking, is hard to decide, as the line is not very definitely drawn. About 40 per cent manga-

We have no doubt that inventors will be ready to communicate with these inquirers. Any letters sent in care of the ENGINEERING AND MINING JOURNAL will be forwarded to them.

#### WATER TANKS FOR MINING PLANTS

Reliability is the chief desideratum of a mining tank. Mine superintendents cannot afford to waste precious time with a tank that must be kept full to prevent shrinkage, or that must be watched to prevent leaks. Neither can they keep close watch over a tank that is likely to freeze in cold weather. They want tanks that they know will be ready when wanted, full to the brim if necessary.

The W. E. Caldwell Company, of Louisville, Ky., has been for a long time engaged in the business of



TANK OF 50,000 GALS. CAPACITY AT ALLENHURST, N. J.

nese is probably near the point. The manganese ores shipped from Leadville, Colo., carry from 18 to 32 per cent; 27 per cent manganese and 23 per cent iron is the average analysis of one of the ores most in demand.

As to price, the schedule of one of the large steel companies shows prices ranging from 21 cents per unit for ore carrying 28 per cent manganese up to 29 cents per unit for one carrying 49 per cent or over. From 4 to 6 cents per unit is paid, in addition, for the iron in the ore, while deductions are made for phosphorus in excess of 0.1 per cent, and silica in excess of 8 per cent.

**Gas Smelting Furnaces.**—We are open for a gas smelter for zinc, or a similar invention for copper and gold smelting. We would like to get into communication with inventors of such devices.—P. C.

**Answer.**—Zinc smelters using gas for fuel are in extensive use by the Cherokee-Lanyon and other companies at Iola, Kan., and on the natural gas belt near that place. Copper smelters using gas are employed in the Boston & Montana plant at Great Falls, Mont.

making such tanks, and believes that it has succeeded in meeting all the conditions. The company's tanks are now in use at mines located in every part of the United States, Canada, Mexico, Central and South America.

The chief reasons for the excellence of these tanks are the wood used and the manner of hooping. Red gulf cypress, grown on the shores of Louisiana makes the best tank wood. And of this, the Caldwell Company uses the most carefully selected wood, absolutely free from sap, knots and all imperfections. It is cut and shaped by men who have made a study of this work for a quarter of a century. It is wood that does not and cannot shrink or swell when the tank is full or empty. The kind of hoops and the method of applying them are just as important as the wood. The width and thickness are not matters of chance, but of close study and experiment. In all cases they are carefully calculated and adjusted to the probable work required of them.

The tank and tower illustrated are located at Allenhurst, N. J. The tower is 63 feet high and the tank has a capacity of 50,000 gallons.

**BRITISH IRON AND STEEL EXPORTS.**—Exports of iron and steel and their manufactures from Great Britain for the 9 months ending September 30 are valued by the Board of Trade returns as below:

	1900.	1901.	Changes.
Iron and steel....	£24,786,562	£19,003,025	D. £5,783,537
Machinery .....	14,650,540	13,425,301	D. 1,225,239
New ships .....	6,408,778	6,316,029	D. 92,749
Totals.....	£45,845,880	£38,744,355	D. £7,101,525

The decreases shown were both in quantities and values. In actual tonnage of iron and steel of all sorts the total this year was 2,188,698 tons, or 609,304 tons less than last year.

**IRON ORE IMPORTS OF GREAT BRITAIN.**—Imports of iron ore into Great Britain for the 9 months ending September 30 were 4,087,584 tons, of which 3,479,612 tons were from Spain. For the corresponding period in 1900 the total was 4,901,934 tons, showing a decrease of 813,850 tons, or 16.6 per cent, this year.

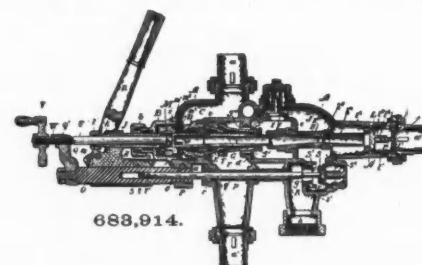
#### PATENTS RELATING TO MINING AND METALLURGY.

##### 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 October 18th, 1901.

683,914. INJECTOR; John Desmond, Cincinnati, O., assignor to the Lunkenheimer Company, same place. Combination of the operating stem bearing bracket therefor,



operating handle, a pivot stop, a pin on the stop and depressions in the face of the bearing for holding the stop locked in its open or closed position.

683,921. MAKING SEAMS OR JOINTS IN SHEET METAL CYLINDERS; Edward G. E. Ffolkes, Toronto, Canada. A riveting splicing strip for securing the edges of sheet metal, consisting of a strip of metal with two rows of rivet points projecting therefrom.

683,929. EXPLOSIVE COMPOUND; William A. Gill, Tarrytown, N. Y., assignor to Rendrock Powder Company, New York, N. Y. The explosive consists of marble dust, chlorate of potash, and a liquid nitro compound, mechanically united.

683,944. METHOD OF ROLLING SHEET METAL; Joseph W. Keffer and Charles B. Cushwa, Pittsburg, Pa. The method consists in reducing an ingot, billet or slab by rolling without reheating to a plate of a width approximately equal to the width desired in the finished sheets and from one-eighth to one-fourth of an inch thick.

683,961. ACETYLENE GAS GENERATOR; Thomas W. Marsden, Iliou, N. Y. In combination, a water tank, several separated parallel generator tubes secured to the tank and depending into the water therein, gas take-off pipes from the upper ends of the tubes, removable open-work carbide crates in the tubes, pipes extending from the exterior of the tank into the generator tubes, respectively, above the lower ends thereof, and provided with valves, for the introduction of an oil-flux into and the discharge thereof from any generator tube.

683,985. WHETSTONE MAKING MACHINE; Ignatius Reitz, Albert J. Reitz and Simon P. Reitz, Portsmouth, O. The machine consists of a frame having openings therein for receiving and retaining the blanks, and one of whose walls acts as a grinding or abrading surface, a revoluble table supporting the blanks in the frame and imparting a rolling movement thereto and means for revolving the table.

683,992. EQUALIZER FOR CRANES; Harry Sawyer, Muskegon, Mich., assignor to The Shaw Electric Crane Company, same place. A cast metal body, provided with a journal bearing between its ends, and with an axle bearing at each end, and wrought metal trussing bolts therefor.

684,022. TWYER IRON; John H. Wiestner, Philadelphia, Pa. A hollow valve having a series of blast delivering



ports in its face, in combination with a fire-box having an opening through its bottom, within which the valve operates.

684,032. PROCESS OF MANUFACTURING OBJECTS FROM ASBESTOS; Adolf Wunsche, Charlottenburg, Germany, assignor to Siemens & Halske Actiengesellschaft, Berlin, Germany. A process consisting in first fashioning the object and then submitting it to the action of silicon fluoride.

684,043. APPARATUS FOR COMMUNUTING METALS; Friedrich W. Buhne, Freiburg, Germany. The combination with means for supporting the metal to be comminuted, of a roller adapted to produce cavities and elevations in the surface of the metal, a cutter adapted to cut off the parts acted on by the roller.

684,048. ACETYLENE GAS GENERATOR; Alfred C. Einstein, St. Louis, Mo. The combination of a casing, a liquid reservoir, a liquid feed tube leading from the reservoir, an outlet member carried by the feed tube, a cap affixed to the outlet member, a tube mounted in the cap and extending into the member, and a pair of wires located in the tube.

684,049. PLATE SEPARATING DEVICE FOR ELECTROLYTIC TANKS; Elmer G. Elliott and Valentine Kishner, Perth Amboy. The combination of anode and cathode plates suspended in the tank, a movable support within the tank, projections of insulating material carried by the support, and means for moving the support and the projections and thereby inserting them between the plates, to separate the plates, and for withdrawing them therefrom, as desired.

684,062. RECIPROCATING CONVEYER; Lyman D. Howard, Columbus, O., assignor to Joseph A. Jeffrey, same place. The combination of a reciprocating hoe carrier, a hoe and a connecting device having two transverse hinges for the hoe interposed between it and the carrier.

684,079. WELL-DRILLING MACHINE; John W. Miller, Akron, O. A revoluble shaft bearing a winding drum and a gear wheel; a feathered counter shaft bearing a pinion arranged to slide thereon, and a ring connected with and arranged to move the pinion, of two pairs of links pivotally connected at one end together and with an interposed rod, forming toggle joints.

684,088. SEPARATOR; Benjamin B. Newman, Tampa, Fla. A separator, comprising a hopper, a fan-casing, a fan therein, a shaking feed board below the hopper, a revoluble cylinder with a yielding face arranged below the board, a breast arranged opposite the cylinder and having a yielding face, a shaking screen arranged below the cylinder and breast, and mechanism for driving the several parts.

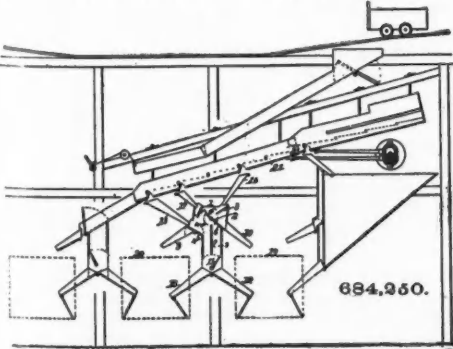
684,102. VALVE FOR REGENERATIVE FURNACES; Joseph Riddell, Bert H. Patterson, William Devlin and Archibald Smith, Sharon, Pa. A valve and valve chamber having internal upper and lower seats, a hollow valve disk having faces for co-operating with the seats, and a tubular valve stem screwed completely through the disk.

684,139. APPARATUS FOR HYDRAULICALLY TRANSPORTING SUBAQUEOUS SOLIDS. Charles Vivian, Islip and Harry R. Wheeler, Brooklyn, N. Y. The combination of a staging and a suction pipe, a branch pipe connected to the suction pipe and capable of universal movement, means carried by the staging for operating the branch pipe, a suction pump connected to the suction pipe, and a discharge therefrom.

684,164. ASPHALT PAVEMENT; Joseph H. Ames, Philadelphia, Pa., assignor of one-half to Charles Fremont Taylor, same place. The process consists in mixing granulated mineral matter with an inflammable oily composition, heating to an intense degree, then mingling with the hot mineral matter granulated asphalt, a fluxing agent and carbonate of lime.

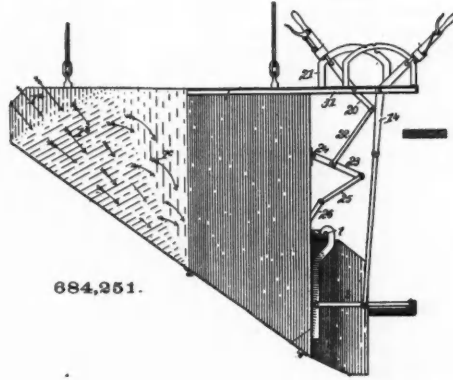
684,201. SUBBASE STRUCTURE FOR ENGINES OR GENERATORS; John Dick, Meadville, Pa. Comprising a masonry foundation, beams bedded therein and secured thereto, an engine frame resting on the beams and a sole plate for an outer bearing, secured to the beams.

684,250. DISTRIBUTER FOR COAL; Grant Holmes, Danville, Ill., assignor to Robert Holmes and Bros., same place. The combination of a hopper, oblique intersecting



partitions in the hopper, and a swingable plate at the intersection of the partitions to make either of the oblique partitions continuous.

684,251. WEIGH PAN FOR WEIGHING COAL; Grant Holmes, Danville, Ill., assignor to Robert Holmes & Bros., same place. A coal weighing pan having an open receiving end and a narrower discharge end, the bottom of the



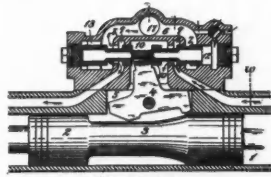
684,251.

pan inclining from the receiving end downward, while the edges of the sides of the pan are so arranged as to form parallel vertical side guides, vertical converging diverting surfaces and oblique chute surfaces.

684,288. HYDRAULIC MOTOR; John D. Murray and James Buchanan, Newcastle, Colo. A frame, crank shafts extended transversely of the frame, having each a double crank in its center and a single crank at each end, the double crank having an extensible and contractible section and means for locking the same, and the end cranks having slots, rods connecting the single cranks of one shaft to those of the other shaft, bolts for fastening such rods to the slotted portions of such cranks, a rod connecting the double cranks, and paddles on the connecting rods.

684,296. ELECTRIC FURNACE; Walther Nernst, Göttingen, and Ludwig Glaser, Coburg, Germany. A furnace comprising a working chamber constructed with a dry electrolyte, conductors for supplying the chambers with current and preheating means for exciting it.

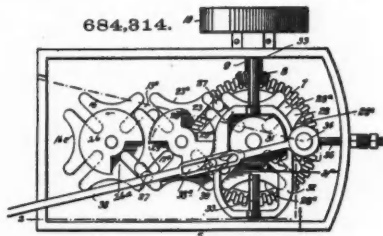
684,307. ENGINE FOR ROCK DRILLS; Patrick H. Reardon, San Francisco, Cal. A direct acting engine with a fluid-actuated piston and a distributing valve to control the



684,307.

motion of the piston and means whereby the pressure of the actuating fluid is removed from one end of the valve to permit the valve to move in one direction by fluid pressure.

684,314. ORE SAMPLER; Jesse Scobey, Denver, Colo. A device adapted to remove a portion of the stream of material to be sampled, and a lever connected therewith, an



684,314.

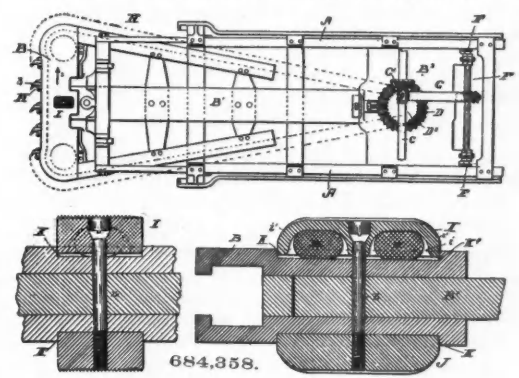
adjustable fulcrum for the lever, and a yoke mounted to reciprocate, and provided with a projection passing through a slot formed in the lever.

684,321. PISTON PACKING RING; William W. St. John, Binghamton, N. Y. The combination of the piston with the divided packing ring and a filling piece having a flange projecting therefrom and a rabbet in the packing ring, into which the flange of the filling piece is seated.

684,325. MOTIVE FLUID DRILL; Henry H. Vaughan, Chicago, and Charles H. Johnson, Chicago Heights, Ill. The combination of a plurality of cylinders arranged around a common center, each cylinder having a port at one end and also a plurality of ports located within the travel of its piston, one of the latter ports of each cylinder connected by a suitable passage with the end port of another cylinder of the series, a reversing valve interposed in the passages which connect the several cylinders, and a piston for each cylinder of the series, the piston having ports adapted to establish communication between the plural ports of the cylinder located within its travel.

684,333. DRIER; Herbert H. Wing, Buffalo, N. Y. A receptacle containing material to be heated and arranged within a chamber, a fireplace communicating with the chamber and a metallic diaphragm filling the entire passage between the fireplace and the chamber and provided with minute perforations to prevent the heated gases from passing through only a part of the diaphragm at one time and to secure a regenerating action by the diaphragm.

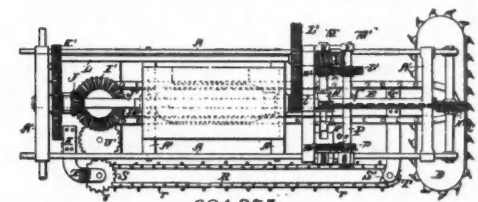
684,353, 684,354, 684,355, 684,356, 684,357, and 684,358. MINING MACHINE; Henry B. Dierdorff, and others Columbus, O., assignors to Joseph A. Jeffrey, same place. The combination with the bed, the carriage sliding thereon, and the cutters arranged to move laterally relatively to the car-



684,358.

riage, of the holding device having a laterally expanded surface adapted to bear upward against the upper wall formed by the main cutters above the carriage, and a horizontal wall of the main kerf, the holder being formed in two parts, of which one is adapted to yield vertically relatively to the other.

684,375. MINING MACHINE; Benjamin A. Legg, Canonsburg, Pa. An endless chain provided with cutters arranged to rotate throughout in horizontal planes, wheels for the chain at the ends of its cut, a driving sprocket wheel situated between the end wheels engaging directly with the



684,375.

endless chain, one or more cross bars supporting the wheels, a sliding non-rotary carriage rigidly secured to and supporting the crossbars, a bed for the carriage, means for moving the carriage forward and back, and means independent of the carriage moving devices for actuating the cutter chain.

GREAT BRITAIN.

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

Week Ending September 21, 1901.

9,731 of 1901. ELECTRO-DEPOSITION OF METALS; L. O. Cowper Coles, London. Improvements in inventor's system of electro-deposition on rapidly rotating mandrels, by projecting the electrolyte tangentially against the mandrels.

15,920 of 1900. ELECTRIC FURNACE; C. P. Steinmetz, New York, U. S. A. An electric furnace of lower temperature than the electric arc, but capable of being more easily controlled.

18,218, of 1900. MORDANT; A. Shearer, Manchester. A double salt of chromic acid and ammonia and soda for use as mordant.

19,076 of 1900. LIGHTING MINERS' LAMPS; J. C. Best, Morley. Improved method of igniting miners' oil lamps by means of electric spark.

19,316 of 1900. ALLOY; C. T. Hennig, Brooklyn, N. Y., U. S. A. An alloy of copper and zinc with ferromanganese.

21,357 of 1900. COMMUNUTING METALS; F. W. Buhne, Freiburg, Germany. A method of comminuting metals by rolling with a rough roller made of harder metal and then shaving off.

4,225 of 1901. CLEARING BLAST FURNACE GASES; B. H. Thwaite, London. Method of cleaning fans used in operating on blast furnace gases.

5,166 of 1901. BLAST FURNACE CHARGER; J. Kennedy, Pittsburg, U. S. A. Improved apparatus for charging blast furnaces.

13,876 of 1901. WASHING OUT BORE HOLES; H. Nagel, Hondam, France. A method for using the water in strata for washing the bore hole in deep boring.

## PERSONAL

Mr. P. C. Stoess, of Wallace, Idaho, has been examining mines in Southeastern Alaska.

Mr. F. M. Kernan will be general superintendent of the new steel plant at Monterey, Mex.

Mr. H. P. Gilbert, of Salt Lake, Utah, has been inspecting mineral properties in Lemhi County, Ida.

Mr. George H. Robinson, of Salt Lake, Utah, has returned from the East last week, and is now in Butte.

Mr. Arthur Jennings, of Wellesley, Mass., has been visiting Gilpin County, Colo., to look after mining interests.

Mr. G. J. Hothersall, a mine owner of Dawson, N. W. T., will remain in San Francisco, Cal., during the winter.

Mr. Arthur Hauman, recently metallurgist Los Animas Mine, near Llano, Mex., has returned to San Francisco, Cal.

Mr. John Berkin, of Butte, Mont., a well-known mining man of the Northwest, is in New York City for a few days.

Mr. B. F. Janes, who recently returned from South America, is to take charge of a mining plant at Placerville, Cal.

Mr. F. Hamilton, of Cripple Creek, Colo., was recently appointed manager of a large mining property near the City of Mexico.

Mr. P. A. Kimberley, of Sharon, Pa., was on the Mesabi Range, Minn., last week inspecting iron mines in which he is interested.

Mr. W. H. Hassinger, vice president of the Republic Iron and Steel Company, is recovering his health at Mount Clements, Mich.

Mr. Franklin Farrell, of Ansonia, Conn., who is conducting extensive operations in the East Butte mining district, is in Butte, Mont.

Mr. H. C. Mundy has returned to El Paso, Tex., from the State of Durango, Mexico, where he went to examine mining property.

Mr. E. Rammelmeyer, of Nelson, B. C., has been appointed superintendent of the New Fairview Mining Company, at Fairview, B. C.

Mr. A. C. Burrage, of Boston, Mass., is on a visit to copper mines in Upper Michigan, and may visit Montana before returning to Boston.

Mr. J. Allen Veatch, manager of the Darien Gold Mining Company, Limited, of Cana, Colombia, S. A., has been visiting mines in California.

Mr. Herbert Ransom has been made coal inspector of the Delaware, Lackawanna & Western Company's coal mines near Forty Fort, Pa.

Mr. George W. Small, mining engineer of Salt Lake City, is examining mining property in the State of Oaxaca, Mexico, for an eastern syndicate.

Mr. C. d'Autremont, of Duluth, Minn., has been visiting Hermosillo, Sonora, Mex. Mr. d'Autremont is a director of the Calumet & Arizona Company.

Mr. G. M. McDowell, a mining engineer representing Portland, Ore., men, is visiting San Francisco, Cal., on business relative to copper mines.

Senator Thomas Kearns, of Utah, owner of the great Silver King Mine and other large mines in Utah, is at the Waldorf-Astoria Hotel, New York City.

Messrs. Stillman F. Kelly and Richard F. Parker, of Boston, have gone to California to examine some mining properties in which Mr. Kelley is interested.

Messrs. W. D. Morse and J. Cooley, of Minneapolis, Minn., have been in Gilpin County, Colo., looking after mining property in which they are interested.

Mr. William Abraham, a member of the British Parliament from Wales, is inspecting the coal-mining industry of Nova Scotia, and will visit Pennsylvania.

Mr. Thomas Pray, Jr., consulting constructing and mechanical engineer has removed his office in Boston, Mass., to 164 Federal Street, in the Edmund's Building.

Mr. J. E. Spurr, of the United States Geological Survey, who is now in the employ of the Sultan of Turkey, has begun his work in Macedonia and Albania.

Mr. W. G. Mosher, with the Minas Prietas Reduction Syndicate, of Sonora, Mexico, has gone to Central America for a company controlled by the same concern.

Mr. Clarence Hersey, assayer and metallurgist, of Leadville, Col., arrived in Salt Lake City, Utah, October 18, and visited Bingham before returning to Leadville.

Mr. Wayne Choate, mining engineer, of Detroit, Mich., is on a professional trip to British Columbia, Utah and Mexico. He will return to Detroit by Christmas.

Messrs. Stephen W. Dorsey, S. W. Taylor, of Denver; E. P. Etting, of Philadelphia, and R. J. Bright, of Indiana, recently visited the Picacho Mines near Yuma, Ariz.

Mr. Walter Douglas, superintendent of the Copper Queen Mine at Bisbee, Ariz., is East on a 6 weeks' trip; during his absence Mr. Stewart W. French will be in charge.

Mr. H. G. Williams, of St. Joseph, Mo., a stockholder in the Hillside Gold Mining Company, operating at Central City, Colo., was a visitor to the property last week.

Mr. T. F. Chandler, a former employe of the Copper Queen Company, at Bisbee, Ariz., has accepted a position with the Pearl Gold Mining Company at Dos Cabezas, Ariz.

Mr. R. Brendel, general superintendent of the mines of La Gran Fundicion Nacional Mexicana, has removed his office from Aguascalientes to Tepezala, State of Aguascalientes, Mex.

Mr. Guy R. Johnson, who was connected with the Duquesne Works of the Carnegie Steel Company, has been appointed furnace superintendent of the Sharon Steel Company, of Sharon, Pa.

Mr. Guillermo Yunge, mining engineer and Commissioner of Chile for the Pan-American Exposition, has been visiting the Pacific Coast before returning to Chile via Buffalo and New York.

Mr. L. T. Beecher, treasurer of the Tennessee Coal, Iron and Railroad Company, with headquarters in New York, has been to the Birmingham, Ala., district looking over trade conditions.

Senator W. A. Clark, of Montana, and Mr. Solon J. Vlasto, of New York City, are traveling through the West. They are now in California and later will visit Mr. Clark's properties in Arizona.

Mr. E. C. Crowther has resigned as general superintendent of the Hamilton Iron and Steel Company's plant, at Hamilton, O., to become manager of the new Minerva furnace at Milwaukee, Wis.

Mr. W. J. Root, formerly chemist of the two furnaces of the National Steel Company, Columbus, O., has been appointed manager of the plant. John S. Kristy has been appointed superintendent.

Mr. F. B. Mechling, formerly with the Cyclops Assay office, at Central City, Colo., has gone to Chihuahua, Mex., to accept a position at the San Domingo Placers, operated by a Mexican syndicate.

Mr. J. H. Lefevre, recently with the South Works of the Illinois Steel Company, has accepted the position of superintendent of the steel department with the Dominion Iron and Steel Company, Sydney, B. C.

Mr. Francis W. Harrell, the mining engineer, who has been made superintendent and general manager of the San Miguel Mining Company, has gone to Mexico to begin opening up the San Miguel group.

Mr. F. A. McDonald, formerly assistant chief engineer of the Pittsburg Coal Company, has been appointed chief engineer of the bituminous coal properties owned by the United States Steel Corporation.

Mr. George Westinghouse, president of the British Westinghouse Electric and Manufacturing Company, Limited, has gone to England, where he will inspect the progress on the company's new plant at Manchester.

Mr. Edward Peacock, who has been with the Big Five Ore Transportation and Reduction Company at Idaho Springs, Colo., has gone to Pioche, Nev., where he will be superintendent of the mines of the Bristol Copper Company.

Mr. Thomas Waddell, of Wilkes-Barre, Pa., who is in charge of the zinc mines in Missouri which he and Mr. George W. Waddell own, has returned to Pierce City, Mo., a short distance from the mining camp, after a visit to Wilkes-Barre.

Mr. C. E. Gault, of Montreal, Que., secretary and treasurer of the Virtue Consolidated Mines, and Mr. A. B. Porcheron, of Canada, a large stockholder in the same company, have been visiting the property at Baker City, Ore.

Mr. George W. Maynard, president of the Monitor Copper Mining Company, has returned from the company's mines on Alberni Canal, Vancouver Island, B. C., and is now at Winnemucca, Nev., where he will examine mining properties for Eastern men.

Mr. Julian Kennedy, according to rumor, will take up his residence for some time in Birmingham, Ala. He was recently called in by the Republic Iron and Steel Company to make estimates on the cost of a large steel plant at Thomas, Ala., 5 miles from Birmingham.

Mr. Henry Bellew has returned to Butte, Mont., from an 18 months' sojourn at Nome, Alaska. According to Mr. Bellew there are now but about 25 paying claims in the vicinity of Nome. There were about 12,000 people in Nome during the summer, but not over 2,000 may winter there.

Mr. Carlos Yensen, of Bilbao, Spain, is in the United States inquiring for machinery for the Spanish market. There is said to be a rapidly increasing demand for American machinery in the Bilbao District, owing to the mining activity there. Mr. Yensen was until recently United States consular agent at Bilbao.

Professor R. A. Smart has resigned his position in the Department of Experimental Engineering of Purdue University at Lafayette, Ind., and connected himself with the B. F. Sturtevant Company, of Boston, Mass., where he will be the head of a department of experimental engineering established to investigate all problems relating to blower practice and to develop new applications of the fan blower in all lines of industry.

## OBITUARY

William P. Hopkins, of Catasauqua, general manager and principal stockholder of the Slatington Rolling Mill, died October 17 at Allentown, Pa., in his 70th year. Mr. Hopkins made the first sheet of tin ever manufactured out of puddle steel, and made at Catasauqua, where he was for 25 years superintendent of the Catasauqua Rolling Mill, the first plate and sheet mill in the Lehigh Valley. Mr. Hopkins invented the water shield for cooling the front of furnaces.

William Rodgers, known as the father of the sheet tin, Russian and blue and planish iron industry in the United States, died recently at his home in Wheeling, W. Va. He was born in Wolverhampton, Eng., in 1827, and came to this country at the age of 30. In 1857 he built the Everson and Preston Works, the first sheet mills in Pittsburg. In 1863 he put 2 sheet mills in the old nail plant at Apollo, Pa., where he made the first black plate for tinning purposes. In 1870 he built 2 mills at Leechburg, Pa., making tin and sheet iron and tin plate. In 1871 he accepted a commission from Governor Geary, of Pennsylvania, to make a mineralogical research of great Britain and Continental Europe. He discovered the secret of manufacture of Russia iron, and after his return manufactured it for a short time at Leechburg. He was the first man to use natural gas for iron making.

## SOCIETIES AND TECHNICAL SCHOOLS

CORNELL UNIVERSITY.—The attendance, including 850 new students, is about 250 in excess of that of last year, and the total registration for the year, inclusive of the medical school in New York and the summer school at Ithaca, will be between 3,250 and 3,500. The registration on the campus, of students in regular courses, promises to be about 2,750. Sibley College has a total attendance of new students, in all classes and courses, of above 350, making the probable total registration for 1901-1902 about 750 in all grades. The College of Civil Engineering has increased 50 per cent, and the other colleges and departments report large additions.

HARVARD UNIVERSITY.—The freshman class numbers 552, a little more than that of last year, though the total for the college shows a decrease. Following are the official figures to date: Harvard College, 1,971; Lawrence Scientific School, 538; Graduate School, 291; Divinity School, 31; Law School, 584; Medical School, 498; Dental School, 104; Bussey Institution, 26; Veterinary School, 0; total, 4,043.

UNIVERSITY OF MAINE.—The following changes have been made in the scientific departments: Gilbert A. Boggs has been appointed instructor in chemistry; John E. Burbank, tutor in physics; Frank H. Mitchell, tutor in chemistry, and Geo. E. Poucher, assistant in physics.

## INDUSTRIAL NOTES

The De Lamar Copper Refining Works has now established headquarters at Carteret, N. J., and is preparing plans for its refinery. H. A. Prosser is manager.

The Nordberg Machinery Company, of Milwaukee, Wis., is at work on a monster hoist for the Tamarack Mining Company, a duplicate of the one recently furnished.

The Stanley Electric Manufacturing Company, of Pittsfield, Mass., has opened offices in the New England Building, Cleveland, O., with Alexander T. Moore, formerly of Pittsburg, as district manager.

The Lake City Engineering Works, of Erie, Pa., shipped last week two 12-in. dredging pumps and engines to the Lovegrove Company, of Philadelphia, and 9 steam water pumps to Frank Toomey, of that city.

The Lukens Iron and Steel Company, of Coatesville, Pa., has broken ground for a new 116-in. plate mill, which will increase the firm's capacity of sheared and universal plates to about 400,000 tons per year.

The F. W. Emerson Manufacturing Company, manufacturer of drafting tables and drafting-room furniture, at Rochester, N. Y., has removed its manufacturing department to new quarters, where they will have more than 3 times the old floor space.

The Buffalo, N. Y., plant of the Allis-Chalmers Company, will be removed to Milwaukee, Wis., within the next 12 months. The new plant under erection at West Allis, Wis., is so far advanced that the machinery may be installed within the next 60 days.

A number of Western workmen are said to be employed in the Lloyd Iron Works, one of the large British pipe mills, and a representative of the Russell Iron Works, near London, is reported to be on his way to the United States to engage several American mechanics for his plant.

Crane Company, of Chicago, Ill., recently secured a contract for \$20,000 worth of pipe, etc., for use in Russian Government mines in Siberia. The pipe varies from 4 in. to 24 in. The company is also turning out a \$10,000 lot of piping, valves, fittings, etc., for an electric plant at Lima, Peru.

Messrs. Tiffany & Company, gold and silversmiths of New York City, have been appointed jewelers and silversmiths to King Edward VII. and Queen Alexandra. During the past 20 years Tiffany & Company have received over a score of other royal appointments and decorations from the principal Courts of Europe.

The Green Engineering Company, of Chicago, Ill., maker of the Green traveling link grates, recently sold Green traveling link grates for 12,000 h. p. of boilers to the Metropolitan Street Railway Company, Kansas City, Mo.; also grates to the La Belle Iron Works, Lake Superior Power Company, and the Waukesha Sheet Steel Company.

Work is now under way upon the foundations for the immense new plant of the B. F. Sturtevant Co., at Hyde Park, Mass. The company states that the buildings can be completed none too soon for its urgent needs, as its present plant at Jamaica Plain, Mass., is now taxed to the limit and is running overtime, particularly in the engine and electrical departments.

In the United States District Court for the Western District of New York Judge Hazel has decided in the case of the Electric Smelting and Aluminum Company, of Cleveland, against the Pittsburg Reduction Company, of Niagara Falls, N. Y., for infringement of a patent for separating aluminum by an electrical process, that the defendant did not infringe the patents of the plaintiff.

The Gould Manufacturing Company, of Seneca Falls, N. Y., has recently shipped 2 of the 8 triplex pumps to be furnished the new Manhattan Railway Power Station in New York City. The pumps are all to be 9 by 12 in., direct connected with 65 h. p. General Electric motors, and each is to supply an 8,000-h. p. boiler. The other 6 will be shipped as fast as the contractors are ready to put them in position.

Charles T. Schoen, of the Pressed Steel Car Company, has been elected a director of the Tidewater Steel Company. The board now consists of C. E. Stafford, formerly of the Illinois Steel Company, president; Evans R. Dick, George McCall, George S. Graham, Charles A. Porter, Richard H. Rushton, F. W. Wood, president of the Maryland Steel Company; A. S. L. Shields and Charles T. Schoen. The sales agent of the company is James G. Lindsay.

At the recent annual meeting of the stockholders and directors of the Delaware Forge and Steel Company, at Wilmington, Del., the following officers were elected: John Fritz, of Bethlehem, Pa., president; Seward Babbitt, of Pittsburg, Pa., vice president; H. T. Wallace, of Wilmington, secretary and treasurer. The board of directors consists of John C. Osgood, of New York City; J. Ernest Smith, Wilmington; H. T. Wallace, Wilmington; John Fritz, Bethlehem, Pa.; Samuel Adams, Jr., Bethlehem, Pa.; J. B. Lawton, Wilmington; H. E. Smythe, Pittsburg, Pa.; William Gorman, Philadelphia, Pa., and Seward Babbitt, Pittsburg, Pa.

Besides the election of George F. Baer to the board of the Pennsylvania Steel Company in the place of John Lowber Welsh, there have been elected to the board Theodore N. Ely, superintendent of motive power of the Pennsylvania Railroad, and F. C. Smink, vice president and general manager of the Philadelphia and Reading Coal and Iron Company. These, with Frank J. Firth, president of the Erie and West-

ern Transportation Company, were recently elected to the board of the Cambria Steel Company as the Pennsylvania Railroad representatives in addition to Effingham B. Morris. Mr. Morris will now be at the head of the Executive Committees of both the Pennsylvania Steel and Cambria Steel companies.

The Ames Shovel and Tool Company, recently incorporated under the laws of New Jersey, with a capital of \$5,000,000, has elected the following officers: President, Hobart Ames; vice-president, Wm. J. Alvord; secretary, Wm. H. Ames; treasurer, Oliver W. Mink. The directors include the foregoing, together with Oliver Ames, Samuel Carr, Gilmer Clapp, Chas. H. Myers, Julius C. Birge, Howard Rowland and G. F. Timmerman. The new company includes the plants of the Oliver Ames & Sons Corporation, at North Easton, Mass.; the Rowland's Sons, incorporated; the St. Louis Shovel Company, of St. Louis, Mo.; the Wright Shovel Company, of Anderson and Elwood, Ind., and the H. M. Myers Company, of Beaver Falls, Pa.

The Spiral Riveted Tube Company has been incorporated under the laws of New Jersey to manufacture and deal in spiral riveted pipe machines, spiral riveted pipe, light and heavy iron work, brass and iron castings, including galvanizing in all its branches. The company is the owner of several recently granted United States patents on improved machinery for manufacturing spiral riveted pipe, which, it is stated, will enable it to manufacture pipe rapidly and with greater economy of labor. The factory will cover a little over an acre of land in Jersey City on the Newark branch of the Central Railroad of New Jersey, with a railroad siding running directly through the works. The building for the galvanizing department is nearly completed, and contains a modern galvanizing plant. This department will be ready for operation November 1, and it is said that the company has enough contracts already booked for outside work to keep it employed for many months. Pipe machines capable of turning out pipe of all sizes from 3 to 30 in. diameter are building at the works of Messrs. Geo. M. Ball & Son, of Brooklyn. The officers of the company are: President and treasurer, John A. Wilbur; secretary, A. Howard Abendroth; general superintendent, Frederick W. Stapf.

#### TRADE CATALOGUES

The A. Wyckoff & Son's Company, of Elmira, N. Y., is sending out copies of testimonial letters it has received calling attention to the merits of its acid-proof wood pipe for mine work.

The Shelby Electric Company, of Shelby, O., issues a 56-page pamphlet describing such patterns of incandescent electric lamps as it is prepared to furnish promptly at all times. All essential parts of these lamps the company makes under the supervision of its own chemists and electricians.

The Broderick & Bascom Rope Company, of St. Louis, Mo., is sending out circulars calling attention to some remarkable durability tests of its parent 8-steel ropes. A length of 2,650 ft. of 1½-in. rope at the salt plant of the Bevis Rock Salt Company, at Lyons, Kan., according to the president of the Bevis Company, was in use 6 years, notisting at the rate of 1,110 ft. in 25 seconds, and yet showed but 2 broken strands.

The Triumph Electric Company, of Cincinnati, O., issues a 6½ by 9½ pamphlet of 60 pages, containing neat half-tone cuts showing the various patterns and types of electric generators and motors that it manufactures, also the construction of armatures, field coils, brush holders, commutators, etc. The direct-connected generators are of the "Standard" engine type and the "Marine" type. As showing the wide range of work for electric motors, a cut is given of one direct-connected to a 500-lb. hammer and of another direct-gear to an egg-beater.

A new illustrated mining circular has been issued by the Sturtevant Mill Company, of Boston, Mass., fully describing its well-known roll-jaw mine crushers, which, the company states, reduce the hardest ores to ¼-in. without the use of screens. The pamphlet also gives information regarding its centrifugal crushing rolls. These, with descriptions of other mining machines, make a circular which should interest parties using this class of machinery. The Sturtevant Mill Company will be pleased to mail this circular to interested parties upon request.

Air compressors of improved design are shown in Catalogue 47, a 6 by 9 in. pamphlet of 20 pages, published by the Sullivan Machinery Company, of Chicago, Ill. These compressors are of the Sullivan straight-line type with single steam cylinder and compound air cylinders. The steam cylinders are fitted with the Meyer adjustable valve gear, which it is stated, enables the cut-off to be adjusted by hand when the machine is running. The air valves are operated by a cam attached to the crank-shaft. The action of the mechanism is claimed to apply spring

pressure to open the valve at the beginning of the stroke and spring pressure to close the valve at the end of the stroke, while in the interval the valve remains stationary.

#### GENERAL MINING NEWS

##### ARIZONA.

##### GILA COUNTY.

*Grand Prize Mining Company.*—This company is working 50 men at its mine, 8 miles from Pine, and about 30 men at the smelter site on the East fork of the Verde. The smelter will be supplied with ores from the Grand Prize and from the Cracker Jack mine, owned by the company. Custom ores will also be treated. All the available teams at Pine and Payson have been hauling machinery and brick for the smelter from Flagstaff.

*Old Dominion Copper Mining and Smelting Company.*—This company is experimenting with fuel oil at its smelting works at Globe to ascertain the cost of generating steam with crude oil-fuel.

##### GILA COUNTY.

*Black Warrior Copper Company Amalgamated.*—E. H. Benson, of Weymouth, Mass., who is to erect the acid plant for the company, has been at the mine. The 4 Herreshoff furnaces for the plant are being furnished by the Nichols Chemical Company, of New York City.

##### GRAHAM COUNTY.

(From Our Special Correspondent.)

*Barkdall & Spaulding.*—This company has its new steam shovel almost ready to begin work on the gravel beds at Walnut Grove.

*Floatrock and Blackrock.*—Many reports are coming from these 2 gold properties. The shafts, about 100 ft. deep, are said to show free milling gold ore.

*Shannon Copper Company.*—The Arizona Copper Company recently conveyed the Black Hawk, White Hawk, and 9 other claims to this company for \$750,000. An agreement was made by the two companies, whereby the ore within the side and end lines, carried down vertically, belongs to the company owning the surface; thus agreeing that the common law rule, which gives the owner of the surface the possession of the minerals beneath the surface of his land shall apply to their respective claims. This agreement obviates the possibility of any friction over apex rights. The company has finished 3 miles of railroad at the smelter, and its 500-ton plant is expected to be in operation by January 1st. A 500-ton concentrator is to be completed early next year.

The Shannon Copper Company was incorporated in 1899 for \$3,000,000, divided into 300,000 shares of a par value of \$10. It was organized by Wm. B. Thompson, formerly of Butte, Mont., and now Boston, Mass. Associated with him are E. A. Carter, of Springfield, Mass., the president of the company; John F. Alvord, of Torrington, Conn.; J. W. Hazen, and Geo. C. Gill, of Holyoke, and others. The stock is reported principally owned in New England, Michigan, and Montana. Philip Wiseman, formerly of Butte, is manager at Clifton. Paul O. Wels, formerly with the Boston & Montana Company, and the Anaconda Company, has charge of the smelter, and G. A. Overstrom, designer of the new Anaconda concentrator, is preparing plans for the concentrator.

The properties of this company are near Metcalf, Ariz., 7 miles from Clifton, at the terminus of the Arizona & New Mexico Railway. Systematic development only began about 2 years ago, and now over 3 miles of tunnels, winzes, etc., have blocked out much copper ore. The ore will be delivered to the railroad on Chase Creek, by a gravity incline 1,400 ft. long and thence by rail, 8 miles to the smelter on the San Francisco River near Clifton. This incline is built and is now being equipped.

##### MOHAVE COUNTY.

(From Our Special Correspondent.)

*Daggett.*—This gold property at Mineral Park is owned by Charles Fay, who has men working it.

*Elkhart.*—J. M. Stratton is superintendent of this Chloride mine. In the 500-ft. level the richest ore yet found in the property is reported cut, and the 200-ton concentrator is being put in order to start November 1. A supply of water for milling can be had from a deep well in the canyon.

*Merrimac.*—The 10-stamp mill is running day and night on ores from the 600-ft. shaft and the 450-ft. levels. The water in the lower workings is under control by the addition of more powerful pumps. The concentrating ore body in the northeast drift is the largest body ever found in the mine.

*Minnesota.*—E. T. Loy, superintendent of the Philadelphia-Arizona Company's mines, near Chloride, is confident that the new 200-ton concentrating plant will be running not later than November 15. The mill building is nearly completed. In the mine a large

force is busy and new cross-cuts and tunnels have been started. The main ore body is reported almost solid lead carbonates, averaging after concentration over 100 oz. silver per ton.

**Tennessee.**—This mine is shipping a car-load of concentrates daily, and the ore bodies in the 350-ft. and 500-ft. shafts are reported as good as a year ago. H. N. Botsford, the superintendent, at Chloride, has 80 men busy.

## YAVAPAI COUNTY.

**Grand Prize Mining Company.**—This company is about to blow in its furnace. The ore carries copper, gold and silver. The ore body will be tapped at a depth of 320 ft. by a cross-cut. The plant consists of a 35-h. p. hoist, boilers, pumps, furnaces, blowers, etc. The daily output is 70 tons, and 40 men are on the pay-roll. Dr. King is superintendent.

## CALIFORNIA.

## AMADOR COUNTY.

(From Our Special Correspondent.)

**Central Eureka Mining Company.**—The company has begun suit against the East Central Mining Company to determine the ownership of the Central Eureka Mine at Sutter Creek. It is the largest producer for the number of stamps in the county.

**Peerless.**—At this mine 2 1-2 miles south from Jackson, the west cross-cut on the 800-ft. level is 115 ft. and must go 30 to 50 ft. The outlook is improving.

## CALAVERAS COUNTY.

(From Our Special Correspondent.)

**Angels.**—This mine at Angels is developed by a 700-ft. shaft which opens the main ore body. The ledge is said to be 13 ft. wide. James V. Coleman, of San Francisco, is owner.

**Calaveras Mining, Water and Power Company.**—Work has been under way for several weeks on the ditch to carry water 30 miles from the Sierras to a chain of gravel claims about a mile from San Andreas. The work is hampered by a scarcity of labor.

**Del Monte.**—At this mine 5 miles from Railroad Flat, 50 ft. of drifts were run on the 200 ft. during September, and the drift is in over 200 ft. The ledge appears of good width in the bottom of the tunnel. Assays show from \$6 to \$120 per ton. The superintendent is to begin cross-cutting from the new tunnel site on Esperanza Creek during October. This tunnel will probably be driven 1,000 ft.

**Lookout.**—Col. W. T. Robinson, owner of this mine near San Andreas, has had a well-known pocket hunter prospecting the property. The lode is formed by the joining of the Gwin and Quaker City lodes and extends over 2,000 ft. through Lookout Mountain, from Chile Gulch to Calaveras River. The vein, it is claimed, will average over 100 ft. wide and is the most extensive surface find in the county. The Gottschalk Mine is upon the same vein to the south and the Spinola and Gold Hill Mines on the north.

**Napoleon.**—This copper mine at Telegraph City is going ahead. Several hundred tons of good ore are on the dump.

**Pyne Smelting Company.**—Several car-loads of copper slag have been shipped to the works at West Alameda. It is estimated that about 2,000 tons will be sent there. The company purchased the old Keystone Smelter at Copperopolis. The old coke bin there has been torn down and the lumber is being hauled to the copper mines at Copperopolis.

## EL DORADO COUNTY.

(From Our Special Correspondent.)

**Centgraf.**—This mine, near the American River, 8 miles east from New Castle, has resumed work after several months idleness. The shaft is being cleaned out and sinking will shortly start. A. B. Eastwood is superintendent.

**Josephine Group.**—A recent strike in No. 5 Tunnel at 480 ft. in and 400 ft. vertical depth shows ore carrying free gold and heavy galena sulphurets. The property, owned by a San Francisco company, is one of the oldest in the county, and is located on the east bank of the American River, opposite Volcano Canon.

## PLACER COUNTY.

(From Our Special Correspondent.)

**Azalca.**—The tunnel at this gravel mine, near Blue Canyon, is in 3,300 ft. The bed is soft and wet. An upraise is to be made to strike the channel.

**Bonnie Bec.**—Mill tests on ore from this mine gave returns from \$23 to \$8 per ton. The company expects to have its drilling machinery on the ground soon. A 10-stamp mill may be built in the spring.

**Eureka Consolidated.**—On its drift property, 3 miles north of Sunny South, the company is still prospecting the channel found at 4,223 ft. from the mouth of the tunnel, and is now following this channel upstream to get on the bedrock. There are good indications of another channel, which may prove to be the Dix Channel. If so, the company will strike it rich. Felix Chaplet is manager.

**Jupiter.**—At this gravel mine near Iowa Hill, the main gangway is being enlarged; 12 men are employed under H. F. Calenberg, superintendent.

## SAN DIEGO COUNTY.

(From Our Special Correspondent.)

**Golden Cross.**—This group of mines in the Cargo Muchacho Mountains, at Hedges, 25 miles northwest from Yuma, is reported to have been bonded to an Eastern syndicate for a large sum. The property has been operated by a receiver for some years. The plant consists of a 100-stamp mill, a 40-stamp mill and a large cyanide plant. Several hundred men are employed.

## SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

**Bullion Mountain Gold Mining and Milling Company.**—The mines belonging to this company 30 miles east from Bagdad, are to be equipped with a gasoline engine, steam hoist, an air fan, shafting, etc., which are now on the road. About 12 men are working day and night shifts. The ore assays \$50 per ton.

**El Dorado Railway Company.**—This company has surveyed a 60-mile road from Ibex to El Dorado Canyon, Lincoln County, Nev., through the Searchlight mining district. Grading, it is said, will start at once. The shops and headquarters are to be at Needles, the company having the use of the tracks of the Santa Fe from Needles to Ibex. At Searchlight the road will connect with the narrow gauge road of the Quartet Mining Company, which is being built to the Colorado River, about 40 miles above Needles.

## SHASTA COUNTY.

(From Our Special Correspondent.)

**Alta.**—This group of 10 gold claims on Sugarpine Gulch near Furnaceville on which a surface pocket was found 2 years ago, in the Cow Creek mining district, has been transferred to F. Gates.

**Bully Hill.**—The smelter is treating 150 tons of ore every 24 hours. The copper output has averaged 350 tons per month since June 1st, and has increased to 400 tons per month. At the mine there are 14 tunnels. Nos. 2 and 3 have each been driven about 1,100 ft. Ore bunkers are being built between the mine and the smelter and over 6,000 tons of ore have accumulated.

**Mammoth.**—This group of copper mines north of Redding is reported bonded to the Boston Exploration Company, of Boston, Mass., for \$250,000. The company will put a large force of men on development and if the mine holds up to reports a smelter will be erected. Some rich ore has been shipped. F. G. King and John Filius engineered the deal.

**Summit.**—This group of copper mines in the Backbone district has been bonded to F. E. Wade, a stockholder in the Mount Shasta Gold Mines Corporation, for one year. He has 4 men busy.

## SIERRA COUNTY.

(From Our Special Correspondent.)

**Oriental.**—At this mine at Alleghany, preparations are being made to start up with a large force of men. The power line will be ready in about 3 weeks.

## SISKIYOU COUNTY.

(From Our Special Correspondent.)

**Barton.**—The Eastern Company building a ditch from McKinney Creek to work this claim on the Klammath River at Buckeye Bar, will soon start operations. A hydraulic elevator will be used.

**Campbell.**—This old hydraulic mine on Sucker Flat, in Quartz Valley, comprising 1,500 acres, is now being operated by A. C. Brokaw with good results. Recently an extensive quartz ledge was found in Hull Gulch, and Mr. Brokaw is erecting a quartz mill.

**Cherry Hill.**—Work on the 300-ft. tunnel at this mine on Cherry Creek is progressing rapidly and will be completed in about 6 months. Machine drills are used.

**Lawry & Company.**—This mine at Rock Creek, 1 mile east of the City of Six, is installing new machinery and the shaft is being pumped out. Eight men are employed.

**North Star.**—This mine, near the Oregon line, owned and operated by Mrs. N. E. Hilt, is said to have developed some rich ore. The main body is low grade, but easily worked.

**Patterson Creek Mining Company.**—At the Sheba Mine on Patterson Creek a deep shaft is being sunk to ascertain the extent of the ledge. The property is equipped with a mill and hoist.

**Spengler Bros.**—This placer and hydraulic mine at the mouth of Humbug Creek, 12 miles northeast from Yreka, is well supplied with water from the creek, and may be able to keep a force at work until next July. The heavy rains early in September caused the start.

## TRINITY COUNTY.

(From Our Special Correspondent.)

**Sweepstake.**—About 250 men are now employed at this mine. A 10-mile trench has been dug, of which

7 miles is on the Canyon Creek side and 3 miles is on the East Weaver side. Pipe has been distributed for 2½ miles on Canyon Creek, and nearly all the pipe to West Weaver. At present 3¼ miles of pipe have been laid and covered. The right of way for both lines has been cleared and brushed out.

## TUOLUMNE COUNTY.

(From Our Special Correspondent.)

**Star King.**—At this mine on the south side of the North Fork Canyon of the Tuolumne River, a fine ore body has been discovered 20 ft. from the shaft on the 375 ft. level. The north tunnel at the 275 ft. is being driven for a pay shoot. A new drill has been put on the 200 ft. level. The 5-stamp mill is crushing ore from the 200, 275 and 375-ft. levels.

**Tanzy.**—At this mine in Sonora \$37,000 in gold was recently taken from a pocket. One-third of all the material taken out is said to have been gold.

## COLORADO.

## BOULDER COUNTY.

(From Our Special Correspondent.)

**Atlas Mill.**—The fine mill at the mouth of Boulder Canon, known as the Atlas or Delano, which was totally destroyed by fire recently, used a chlorination process and only worked during the day time. It was the largest structure in the county, and was considered profitable if enough ore could be procured. The loss is from \$100,000 to \$125,000 with about \$40,000 insurance. There is some talk of rebuilding.

**Cairo and Tennessee.**—These mones, also in Sunshine District, are being actively worked by leasers, who are taking out good ore.

**Cash.**—Pennsylvania parties, who have a lease and bond on this mine, are rapidly developing it with 3 shifts of men. Some very rich silvanite ore has been found while sinking, and the property promises to be a heavy shipper.

**Eldorado.**—The Pennsylvania Mill, at Sunshine, is being moved to Four Mile Creek below Salina, to treat the ores from the Eldorado Tunnel, in which a large number of veins have been cut. W. H. Nicholson is in charge.

**Pilot.**—This bonanza prospect, at Sunshine, which produced \$12,000 to \$14,000 clear in about 6 months, is now shut down because of litigation.

**Yellow Pine.**—Parties who have had an option on this famous mine and who have been blocking out ore, have closed down operations indefinitely. It is not known what will be done with the property.

## CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

**Aliunde.**—Four levels are being driven in this mine at Silver Plume. The ore body now showing in the 10th adit is about 2 ft. wide and shows 300 oz. silver per ton.

**Burns-Moore Tunnel.**—This Idaho Springs Company has put in 1,700 ft. of pipe to furnish power to 2 wheels, one of 30-in., to drive the dynamo, and one of 60-in., to drive the air compressor. The management is experimenting with electric drills, but these may be replaced by Leyners.

**John Owen Mining and Milling Company.**—John Owen has brought suit against Lombard Williams, of Boston, and Gibson T. Williams, of Buffalo, for the recovery of money advanced to work some mining property near Idaho Springs. Suit for salary is included.

**Monarch Company.**—The McClelland tunnel is being driven by contract with air drills. Boston people recently took over the property, comprising over 100 claims, including the Freeland Mine. The tunnel is to be driven over a mile. It is now in 850 ft., and advancing about 8 ft. per day.

**Newhouse Tunnel.**—The management has bought an electric mine locomotive, and is installing a dynamo at the mouth of the tunnel. The tunnel is in over 2 miles, necessitating rapid transportation. Five companies are working veins in the tunnel, which is going ahead 10 ft. per day and breaking down an average of 100 tons rock.

**Occidental Development Company.**—At the 6th level 2 ft. of \$60 ore are opened in the Fraction Mine at Idaho Springs. Work in the Harrisburg is also opening milling ore.

**Seaton Mining and Milling Co.**—Sinking of the winze-shaft has started below the tunnel level in the Seaton Mine, Idaho Springs. The ore body is 400 ft. long, and the pay streak about 2 ft. wide. It nets about \$40 a ton, and runs in lead, gold and silver. It is the intention to keep sinking on the ore shoot. Present depth is 800 ft.

## GILPIN COUNTY.

(From Our Special Correspondent.)

**Boodle.**—Messrs. Wrigley and Waters, of the mining firm of Waters Bros. & Kitchener, representing a British syndicate, have made the final payment of \$20,000. The price was \$40,000. A new boiler and pump have been installed and the purchasers will begin

development at once. W. J. Richards, Central City, is in charge.

**Bonanza.**—Leasers took out milling ore from the tunnel workings, giving returns of 10 oz. gold per cord, besides a good grade of tailings. Eastern parties are the owners, with S. A. Raun, of Central City, as manager.

**Clear Creek Valley Reduction Company.**—Dr. F. R. Carpenter, general manager of the Golden pyritic smelter has awarded a contract for \$30,000 worth of machinery for the smelter and the Saratoga Mine. A hot air furnace is to be added to the smelter and a new hoist with a capacity of 3,000 ft. installed at the mine. The smelter has again started after a shut down of over 2 weeks, while the water jackets were being repaired, and Manager Carpenter expects to keep it going steady. He says that the results on the Gilpin county ores have been very satisfactory and that there is no scarcity of ore.

**Delmonico Gold Mining Company.**—The company intends sinking the main shaft down 400 ft., making it 800 ft.

**Golden Wedge Group.**—This group of 5 claims in Lake and Russell district, has been sold by E. W. Williams & Co. to the Cashier Gold Mining and Reduction Company for \$70,000. The purchasers are interested in oil enterprises in the East and Wyoming and intend extensive development. The property has been a splendid and regular producer of smelting ore. B. L. Campbell, Central City, is in charge.

**Ingalls Gold Mining Company.**—This company is incorporated with a capital stock of \$15,000 in 1,500,000 shares of 1c. each, the directors for the first year being C. C. Griffin, W. R. Benzie, J. E. Hunter, J. M. Shrote and L. E. Drake. The company has taken a lease and bond on the Ingalls Mine in Illinois-Central District and will put up machinery at once. L. E. Drake, Central City, is in charge.

**Ridgewood.**—Sinking has started to go 200 ft., or 800 ft. deeper in all. Boston parties are interested with B. P. Hammond, Central City, in charge.

**Town Topics Gold Mining Company.**—A third dividend of \$5,000 has been declared, payable on November 1. The company is operating the East Notaway Mine on the tribute system. M. D. Draper, Central City, is manager.

**Tucker.**—Eastern parties have an option and are installing a 50 h. p. plant of machinery and putting up a new shaft building. The 200 ft. shaft will be sunk 200 ft. W. A. Wood, Central City, is superintendent.

#### GUNNISON COUNTY.

**Augusta.**—The new machinery for this mine, near Crested Butte, is in place. The Woods Investment Company, of Denver, owns it.

**Iron Bonnet.**—A. C. Brownell and a company of New York men are contemplating operating this property on Gold Hill in the Tin Cup District. An inclined shaft down 150 ft. shows ore said to assay \$140.

**Maid of Athens.**—This mine is shipping 200 tons a month. One body of ore is reported over 23 ft. across and assaying from \$20 to \$100 a ton in silver.

**Tilton.**—W. G. Tilton and associates are equipping this group on the Ceballa River with new machinery, and will use power drills. The tunnel is to be driven 3,000 ft., and will open the Carpenter vein. The company has a concentrating mill on the Ceballa.

**Wallace Mining Company.**—This company, representing Denver men, is pushing work on the Citizen Mine in the Pitkin District, near the Maid of Athens. Shipments aggregate about 300 tons a month.

#### HUERFANO COUNTY.

**Huerfano Coal Company.**—Work on this company's property, 3 miles south of Walsenburg, is being pushed by Messrs. La Belle and Murphy. New boilers are being placed. This is the only property in this county that will be operated through a shaft.

#### LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

**Caribou.**—In this, formerly the Bison Mine, Geo. Campion is now opening up a large manganese body and also a better grade of iron ore. Some very good lead values are also obtained while shipments of 200 tons a day are kept up. A new find of lead sand assays as high as 40 per cent. lead and 200 oz. silver.

**Denver Hill Consolidated Mining Company.**—This Yankee Hill property is worked by lessees who are making regular shipments from a good iron body.

**Empire Gulch Mining Company.**—The new ore body is developing nicely, and the bins are filled with good grade material.

**First National.**—The 200-ft. level is being extended to get underneath the main ore shoot. Meantime the tonnage is 25 tons a day from the lead sulphide shoot at the 150-ft. level.

**Forest City Leasing Company.**—This company controls the Forest City No. 2, the Chataqua, Chimeta and Lalla Rookh claims lying north of the New Monarch. On No. 2 Forest City at 250 ft. a fine copper-lead sulphide is cut. Pumps to control a heavy flow of water have been ordered. The strike is very important to the northwest slope of Little Eden Hill. G. W. Codrey, M. B., and L. B. Carpenter and Hon. Calvin Butler, all of Denver, are at the head of the new company.

**Gold Basin Mining Company.**—This local leasing company on the old Big Four territory in a drift at 235 ft. has opened a 4-in. vein similar to that in the old workings which yielded rich returns. The walls are quartz porphyry. Sample assays show a \$300 net value as follows: Gold, 12 1-2 oz.; silver, 126 oz., and lead, 13 per cent. John Walsh, formerly manager of the old Big Four Company, is in charge of the Gold Basin Company.

**Golden Eagle Mining Company.**—The reports presented at the annual meeting were satisfactory. The royalties for the year amounted to \$13,015. Three dividends of \$4,890.15 were declared while the expenses were only \$1,380. All of the company's territory that is worked is under lease. The royalties came from the Vinnie, the output from which was 2,688 tons of ore, worth \$59,241. The company elected the following officers: J. H. Weddle, president; George W. Skinner, vice-president; W. W. Davis, secretary; W. P. Sargeant, assistant secretary; C. T. Limberg, treasurer.

**Gordon Group.**—This includes the Mayflower, Sunflower, Carleton and half of the Oro City properties in California Gulch. The new lessees have started a new shaft after the rich silver-lead shoot caught in the Lime claim adjoining.

**Greenback Mining Company.**—Since tapping its new ore shoot this mine is producing 100 tons per day. The sulphide is of uniform grade, 300 ft. wide and 200 ft. deep from the upper level. This ore is free of zinc and carries a small percentage of lead and copper.

**Homer Placer.**—The new shaft of the Leadville Tunnel and Drainage Company has caught water at 160 ft. and sinking has ceased. A churn drill will be used to explore the ground below.

**Nayr Mining Company.**—The new drift at the 700 ft. on the old White Cap Mine has cut 3-ft. of lead sulphides carrying 50 per cent lead, 15 oz. silver and .06 oz. gold. This is the first discovery of the sulphide contact on that part of Iron Hill. The property can handle 100 tons a day from the new strike as soon as opened up. Adjoining territory will immediately prepare to catch the contact. The company is headed by Chicago and Denver men and the work has been in charge of James Shinn.

**New Elkhorn Mining Company.**—Prospecting is being carried on at 300 and 400 ft. under Manager Walter S. Kelley. So far nothing of shipping value has been found.

**Nora.**—This property adjoining the Dyer is worked by lessees who are following a streak of ore that gave returns of several thousand ounces of silver and 60 per cent lead, but which has not developed into an ore shoot.

**Ohio Gold Mining Company.**—This new gold belt property is making excellent headway. Local people are at the head of the company, which is backed by eastern men.

#### TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

**Ben Hur Mining and Milling Company.**—A circular, issued by the directors, calls the deferred annual meeting for November 11, when the stockholders will be asked to approve the sale of the Minnie H. and Moss Back claims to the Stratton Cripple Creek Mining and Development Company for \$12,000. The claims comprise about 3 1-2 acres, on Globe Hill, adjoining the other Stratton properties, but was so cut up into small parcels that it is practically impossible for the company to work extensively. The meeting will also elect directors.

**Consolidated Gold Mines Company.**—The new hoist on the Gleason shaft, of the Wild Horse Mine, is in use. The shaft will be sunk to the 1,000-ft. as rapidly as possible, when a new level will be run to cut the ore body and connect through the Uintah Tunnel with the Columbine Victor Tunnel.

**Doctor Jack-Pot Mining Company.**—The new pump has been put in at the 900-ft. level. The capacity is said to be 2,000 gal. per minute, or considerably more than that of any other pump in the district. The property has been bothered by water for some time.

**Doule-Burns Suit.**—This famous suit, which is being tried in Council Bluffs, Ia., has been continued for a month by Judge Macy to give the defendant time to prepare new evidence. The suit involves a large amount of stock of the Portland Gold Mining Company.

**Elkton.**—A new 250-h. p. boiler is being installed to allow the pumps to run full speed, and an attempt will be made to unwater the 100-ft. level.

**Golconda.**—This property, on Squaw Mountain, will be worked by Philadelphia capital, under the management of Mr. Argensinger. Unwatering the old workings is progressing rapidly, and the 640-ft. level has been reached. About \$1,000,000 worth of development has been done on the property.

**Magna Charta Gold Mining Company.**—Several months ago this company brought suit against the Colorado Gold Mines Company to recover its extensive acreage on Ironclad Hill, which the latter company had bought in at an absurdly low figure at a tax sale. The ground is said to be worth about \$100,000. A decision has been granted recently in favor of the Magna Charta Company.

**Mary McKinney.**—The Burke & Frye lease just terminated is called one of the best ever worked here. The lessees are said to have cleared about \$20,000. For the present no more leases will be granted on the ground.

**Mary Nevin Gold Mining Company.**—The directors have bonded the property for \$100,000, and leased it to L. H. Jansen for 18 months. The lease calls for 20 per cent royalty and 400 ft. of sinking in the shaft. The ground adjoins the El Paso Consolidated Company, and has shown some rich ore.

**Vindicator Gold Mining Company.**—The regular quarterly dividend of 3 c. a share on the 1,100,000 shares issued has been declared. Also an extra dividend of 2 c. a share. The mine is said to be in excellent condition with the value of the ore increasing.

**Woods Investment Company.**—The action of this syndicate in forbidding its employees to live in the city of Cripple Creek, is causing considerable comment. The Woods Company has a large number of employees who, until recently, have been allowed to live wherever they chose. The reason for the change is said to be that the Cripple Creek city council refused to grant the Woods syndicate a franchise for lighting.

#### IDAHO.

##### BLAINE COUNTY.

**Crocus Gold and Copper Mining Company.**—S. E. Riggs, of Spokane, Wash., has conveyed to this company the Crocus and Crocus Extension lodes and mill sites, 4 miles west of Hailey. The price is stated to be \$350,000.

##### IDAHO COUNTY.

**Gold Eagle.**—Returns from a car-load of ore recently shipped from this mine in the Neal District, operated under the management of Dr. W. D. Southworth, are reported an average net return of \$80 per ton. The ledge is large, and, it is said, one-fourth is shipping ore. The mill is running steadily.

**Sunbeam.**—This property, in Neal District, is reported to show rich ore carrying gold, silver and lead. A large crew of men is busy.

**Lucky Ben & Hornet.**—Jay A. Czizek, ex-state mine inspector of Idaho, is interested in this property at Warren, in connection with A. W. McCune, of Salt Lake. The ore is high grade, assaying well in gold and silver. The present owners are putting in a great deal of money in developing the property. The great trouble so far has been the lack of railroad facilities, but the Pacific & Idaho Northern will be completed as far north as Salmon Meadows next year, within 55 miles of the mine.

##### OWYHEE COUNTY.

**Never Sweat.**—The owners are erecting a shaft house 20 by 50 ft. Work will be prosecuted at the mine all winter.

**Poorman.**—Sinking has been resumed in this mine at Silver City. The flow of water on the 1,000-ft. has diminished considerably, and by bulk heading, the flow has been retarded enough to resume work in the shaft. The property will soon be equipped with a large electric pump. Mr. Gerling is foreman.

**San Juan.**—Messrs. John and Fred Grete, owners of this group on War Eagle Mountain have arranged to open the old shaft on the White Phantom claim, which has been closed for 25 years. This claim is on the north end of the group.

**Trade Dollar.**—The compressed air plants at this mine at Silver City aggregate something like 225 h. p. The power is used for drilling, pumping, hoisting, etc.

**Sinker Tunnel.**—This tunnel under War Eagle Mountain is in 5,300 ft., and is progressing 10 1/4 ft. per day.

##### SHOSHONE COUNTY.

**Coeur d'Alene Mining Company.**—Dredging machinery is being hauled in from Sunset. A dredging plant may take the place of the hydraulic elevator which started in the fall of 1900, running until stopped by cold weather and again all spring and summer this year.

**Hercules.**—This lead-silver mine, near Butte, has commenced shipping. Regular shipments of about 2 car-loads a week are expected to be made.

**Ohio-Idaho Mining and Development Company.**—This company recently purchased the Orion Mine, in Pierce District. The company has begun development work, which will be continued throughout the winter. A large hoist will be installed, and the main shaft sunk to 300 ft. or more. Drifts will be run at each 100 ft. level. The machinery is nearly installed. There are now 14 men steadily employed. Horace Willison is in charge.

**Wild Rose.**—This mine, in Pierce District, shipped 200 oz. of gold bullion recently, returns of the last mill run. The ledge is reported 15 to 18 ft. wide.

## WASHINGTON COUNTY.

**Heath District.**—Prospects for the Heath District are reported bright. When the smelter at Vulcan is in operation at least five or six of the mines there will be prepared to ship. Just now the Stenwinder is the only mine doing development. A 300-ft. tunnel has been run, now on the lead. It is a concentrating proposition, and the company is arranging to put in a concentrating plant. A wagon road is being built to the Railroad Mine, and the Lookout Mine will soon start up again. The What Cheer Company has been reorganized and will commence operations. The Maxwellton and Dewey and Hobson mines have been bonded to Salt Lake parties, who will do some prospecting.

## ILLINOIS.

## HENRY COUNTY.

**Kewanee Coal and Mining Company.**—This company, at Kewanee, is pushing entry work, the daily output at present being about 150 tons, which will steadily increase.

## INDIAN TERRITORY.

The Cherokee Indian Nation, through its principal chief, Thomas M. Buffington, and treasurer, J. M. La Hay, has instituted equity proceedings against Secretary Hitchcock and other officials to enjoin them from granting leases of Cherokee lands for mining purposes. The court issued a rule against Secretary Hitchcock to show cause by October 31 why the injunction should not be granted. The Cherokees cite numerous applications of non-citizens, and claim that the Interior Department is about to grant a lease for 11,520 acres to the Cherokee Oil and Gas Company, out of the latter's application for 94,000 acres. They say the leases are in utter disregard of the treaties and patent of the United States, guaranteeing the Cherokees 7,000,000 acres and right to exclusive occupancy.

## KANSAS.

## WYANDOTTE COUNTY.

*(From Our Special Correspondent.)*

**Argentine Smelter.**—The Argentine Smelter which has been closed down for several weeks will be visited by Daniel Guggenheim, Barton S. Ewell, Simon Guggenheim and Anton Ellers, officers of the American Smelting and Refining Company, who are expected to decide whether work at this plant will be resumed or not. Over 800 men were employed and every effort will be made to secure a resumption.

## MICHIGAN.

## COPPER—HOUGHTON COUNTY.

*(From Our Special Correspondent.)*

**Copper Shipments.**—About 2,500 tons remain on the docks at Dollar Bay. Last week a single shipment of 2,800 tons was made, the largest cargo ever carried on the lakes. The wire and rolling mills at Dollar Bay are running full capacity.

**Atlantic.**—Recent developments at the exploratory shaft on section 16 indicate that the Baltic lode may be near at hand. The cross-cut has encountered a good copper-bearing lode. John Stanton, president of the company, is at the property.

**Calumet & Hecla.**—Enlarging and remodeling 5 refining furnaces at the smelting works at South Lake Linden is being pushed, and Superintendent J. B. Cooper expects to have the work completed by the close of navigation. Iron platforms on top of the furnaces to hold the copper will be put in, and the furnaces will be filled at the top. The new arrangement permits the copper to stand on the platform for 24 hours, thus giving time for considerable moisture to evaporate before it is dumped into the furnace. The new furnaces will have an increased capacity of about 50 per cent.

**Champion.**—The steel shaft and rock houses are about completed, and the machinery is being tested.

**Elm River.**—Two drills are opening up the new lode recently encountered in a 390-ft. cross-cut.

**Mayflower.**—A compressor and hoisting engine is moving to the site of the new shaft. Sinking will be under way with a large force in 2 weeks. The lode is 15 ft. wide.

**Mineral Range Railroad.**—The Houghton & Calumet branch has been rebalanced, new ties laid and new rails are being laid. The entire 60 miles of track will be made standard gauge. The rock ser-

vice between the Tamarack-Osceola mines and mills will also be improved.

**Old Colony.**—The lode encountered with the diamond drill will be explored by a shaft.

**Osceola Consolidated.**—The 4-head addition to the stamp mill on the shore of Torch Lake will likely be completed before January 1. The steel work was finished some time ago, and a large force of carpenters is now employed on the woodwork and the launders. The foundations have been completed for 2 heads, and the third is nearing completion. About 110 positive slow return jigs and 18 round slime tables have been installed. The 3 Wilfley tables are not in place. The steel boiler house, adjoining the mill at the back, is nearly completed. The foundations for the boilers are finished. A battery of 12 locomotive firebox boilers, having 2,500 h. p., will be installed. A brick-lined self-sustaining steel stack, 150 ft. high above its foundations and 9 ft. in diameter, has been erected.

**St. Mary's Canal Mineral Land Company.**—Diamond drill work for the Baltic amygdaloid lode continues on section 21.

**Winona.**—Work is practically confined to No. 2 shaft, which is sinking to the 5th level.

**Wolverine.**—The machinery for the pumping plant is arriving from the Snow Manufacturing Company, of Buffalo, N. Y.

## COPPER—KEWEENAW COUNTY.

*(From Our Special Correspondent.)*

**Mohawk.**—Sixty-eight jigs are being constructed at a Hancock foundry for the mill. A rock crusher with jaws 9 by 16 in. is to crush stone for concrete at the mill. Seventy-two jigs for the Wolverine Mill have arrived.

**Phoenix.**—This company has secured a lease of one head of the Arnold Mill for 2 years, and no mill will be built this year. The Hancock and Calumet Railroad will construct a branch line of 4 miles from the mine to the Arnold Mill.

## COPPER—ONTONAGON COUNTY.

*(From Our Special Correspondent.)*

**Adventure.**—Several hundred men are employed by the bridge and railroad companies and sub-contractors.

**Mass Consolidated.**—New ground is being rapidly opened in anticipation of the operation of the 2d head at the mill in January. Two drills are sinking the Ridge shaft to the 11th level, and 2 are sinking No. 3 shaft to the 10th level. The old Mass workings are pumped out for 400 ft. A new shaft is started on the Knowlton lode, and another will be started within a few months. It is expected that sinking in the Evergreen shaft will be resumed soon. At present about 400 men are employed at the mine and mill. At the mine there are 37 Rand drills in use, 20 in stoping, and the remainder in sinking, drifting and cross-cutting.

**Penn.**—Surface explorations are pushed. The 2 shafts have been cleaned out, one is down 70 ft., and the other 100 ft. Twenty-five men are employed under Captain W. A. Dunn.

## IRON—MENOMINEE RANGE.

Thomas J. Spencer has transferred his option on 400 acres of land near Norway to a syndicate represented by W. S. Shaw, of Norway. The land lies south and west of the new shaft of the Cragon Mine. A shaft now down 130 ft. is to be enlarged and sunk deeper. Orders have been placed for a boiler, hoist and compressor. The purchasers, it is said, will ship what ore they mine to a charcoal furnace to be built at Pine City. Thomas J. Spencer will have charge of mining work.

**Florence.**—About 60 men are now employed at this mine at Florence.

**Great Western.**—Three Wickes boilers are being installed at this mine near Crystal Falls. The shaft is being sunk 60 ft. per month.

**Hiawatha.**—The stockpile of this mine near Crystal Falls, about 25,000 tons of ore, has been sold.

## MINNESOTA.

## IRON—MESABI RANGE.

*(From Our Special Correspondent.)*

A tract of 400 acres in T. 59, R. 15, has just been taken for exploration by an Eastern steel making syndicate.

**Genoa Iron Company.**—The Genoa Mine has reduced shipments on account of damage to the steam shovel, and owing to rain.

**Minnesota Iron Company.**—The Auburn Mine will probably ship this year about 500,000 tons. The Auburn made a remarkable record in September, raising through its single shaft 80,865 tons. The shaft is equipped with a pair of 5-ton skips running in balance. The mine is a milling proposition, and ore is run to the shaft on a belt line road and trammed by hand. Almost the entire output was mined during the season of navigation.

## MISSOURI.

## JASPER COUNTY.

*(From Our Special Correspondent.)*

**Joplin Ore Market.**—The week closed with zinc ore \$2 higher. Lead remained unchanged with a strong demand at \$23.25 per 1,000 lb. The Missouri-Kansas Zinc Miners' Association has been very active during the week, and it is believed arrangements are being made for a large exportation of zinc ore before January 1.

Mr. Frank Nicholson, the mining engineer, who has offices here and in New York City, has returned from Europe and claims he is negotiating with the railroad companies for a freight rate of \$5 per ton for zinc ore from this district to Europe.

Much zinc ore is being held for \$30 and while last week's sales show a very large tonnage there is a great deal of high grade ore left unsold. The lead production was cleaned up, and the demand was very satisfactory.

The top price paid for zinc was \$29.50 per ton for 40 tons from the Excel Mining Company on a straight bid, but the assay showed it to exceed 64.5 per cent, or 1 per cent over any other assay reported for the week. The balance of the sales reported ranged from \$28.50 down.

During the corresponding week of last year the top price paid for zinc ore was \$28.50 per ton, and \$23 per 1,000 lbs. for lead. Last week's shipments exceeded those of the corresponding week of last year by 1,496,080 lbs. of zinc ore and 138,730 lbs. of lead ore.

Following is the turn-in by camps of the Joplin district for the week ending October 19:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,756,720	498,310	\$49,491
Cartersville	1,386,140	265,180	23,492
Galena-Empire	1,242,470	143,030	18,235
Aurora	1,080,110	30,440	12,077
Oronogo	725,520	36,830	9,971
Webb City	529,920	26,310	7,236
Zincite	403,670	13,940	5,778
Granby	347,000	87,000	5,115
Carthage	390,940	.....	5,278
Duane	238,700	40,370	4,042
Reading Springs	286,710	8,140	3,453
Carl Junction	523,450	.....	7,067
Spurgeon	140,500	34,950	2,188
Cave Springs	139,040	16,130	2,008
Wentworth	132,000	.....	1,732
Central City	93,510	7,860	1,295
Sherwood	92,380	.....	1,291
Ash Grove	.....	50,000	1,100
Total	10,518,330	1,258,490	\$180,740

Zinc value for week, \$131,950; lead, \$48,799; zinc value 41 weeks, \$5,449,656; lead, \$1,154,439.

**Ozark Oxide Company.**—At a recent meeting of the stockholders of this zinc oxide plant it was decided to enlarge the Joplin plant to almost double its present capacity. The plant, which is entirely new, has not started and as the addition is decided on, the furnaces now completed will not start until November 10.

## ST. FRANCOIS COUNTY.

*(From Our Special Correspondent.)*

The Sweringen syndicate, that has been prospecting some lands west of Bonne Terre, has shut down drilling for the season.

**Desloge Lead Company.**—This company is erecting a new smelting plant at its mine on Big River, which will be equipped with 5 Freiberg roasting furnaces and a water-jacket blast furnace. This is in addition to its plant of 5 Flintshire furnaces, the slag from which was sold in the open market. A new shaft, No. 4, is being sunk on the western end of the Desloge property, near Big River.

**Doc Run Lead Company.**—The company is sinking 2 new shafts, Nos. 7 and 8, on its Flat River property, one of which will relieve the main or No. 3 shaft, in which most of the pumps are located.

**Federal Lead Company.**—The new mill at Flat River is expected to be running by December 1. The company has purchased a large tract of land at Alton, where the new smelter is to be erected. The site possesses excellent railroad facilities, and is close to the Illinois coal-field.

**Nellie Mitchell Lead Company.**—This is a new St. Louis company that is prospecting some lands on Big River, about 5 miles west of Irondale, with a diamond drill.

## MONTANA.

## CASCADE COUNTY.

**Montana Stucco Company.**—This company whose plant, near Kibbey, was recently destroyed by fire, has decided to erect a new plant, of greater capacity, within the townsite of Monarch, near the railroad.

## CHOCTEAU COUNTY.

**Mission Peak Mining Company.**—This company's new 10-stamp mill at Landusky has made its first clean-up. The cyanide tanks will not be ready until next spring, and the mill is being run as a concentrator. The capacity is 25 tons per day, and the ore is reported about \$14 per ton. A small sum is saved at the stamps, but most of the value is in the concentrates. The company is employing 20 men.

## FERGUS COUNTY.

**Burke and Sweeney.**—These sapphire mines, it is said, about December 1, will become the property of

the American Gem Company, that under the name of the American Gold Mining Company, owns sapphire mines on Rock Creek, in Deer Lodge County. The syndicate is composed of the McLures and Paul A. Fusz. About 15 men are at present employed at the mines. P. T. Sweeney has charge.

## JEFFERSON COUNTY.

(From Our Special Correspondent.)

**Monarch.**—C. Crangle and associates, of Basin, have taken this mine at the head of Basin Creek under bond and lease, and are unwatering it.

**Ada.**—This property is again an active shipper. Twelve 6-horse teams are hauling ore to Basin from whence it goes to the Heinze smelter at Butte. It is said that the ore averages 4 per cent copper with a fair value in silver. Forty tons of ore per day are mined.

**Minah.**—This property, 2 miles northwest of Wickes, has been leased to N. W. Pearson, of Butte. He has a lease on Tunnels Nos. 1 and 2 and is to keep 15 miners at work after the first 30 days. The property is supposed to belong to an English company, but, pending an appeal to the Supreme Court, is in possession of J. O. Brisco, who was the vendor.

**Eva May.**—The mill shut down on account of a water shortage. The company contemplates sinking the 600-ft. shaft to 1,000 ft. and new hoisting machinery will be ordered.

**Buckeye.**—This property, at the head of Basin Creek, is being operated by C. J. Davis, of Michigan. The mill has been overhauled, and new sinking machinery will be installed at once.

## MADISON COUNTY.

(From Our Special Correspondent.)

**Copper Queen Mining Company.**—At the mine in Coal Canyon, the crosscut on the 200-ft. level has cut 2 ore bodies. The ore is malachite, azurite and black oxide of copper. The ore, which is sent to the smelters is said to average 15 per cent copper with small values of gold and silver. The ore goes to the cars at Iron Rod and is shipped to Butte. Mat Dorosia is superintendent.

**Red Chief.**—The concentrator, together with the mine, is closed temporarily pending a change of motive power from steam to electricity. The current will be taken from the Madison Power Company.

**Pole Creek Placers.**—Work under the management of G. W. B. Turner has ceased for the season with everything ready to start on a large scale in the spring. A Butte company holds a bond on the property.

**Watscka.**—Mitchell & Turner, of Butte, have sold this company a compound duplex Worthington pump good for 11,000 gal. per minute on a 600 ft. lift. This pump is to be placed at the 600-ft. station of the new shaft.

**Garrett Group.**—This property in Barton Gulch is under lease and bond to Butte parties who will have miners at work by November 1. The ledges show a fair per cent of copper.

## MEAGHER COUNTY.

(From Our Special Correspondent.)

**Home Copper Company.**—Twelve men are busy; a 30-ton lot of ore shipped to the Columbia Smelter at Butte samples 35 per cent copper, being principally cuprite. The shaft is 200 ft. deep. Machinery has been ordered and the shaft will be sunk to 500 ft. It is situated about 3 miles from Minden. J. J. Sullivan, of Butte, is in charge.

## SILVER BOW COUNTY.

(From Our Special Correspondent.)

The press throughout the State is generally supporting the suggestion of United States Senator W. A. Clark that \$50,000 be raised by popular subscription for a state mineral display at the Louisiana Purchase Exposition at St. Louis in 1904. Senator Clark will head the subscription list, and the Butte Board of Trade is expected to push the matter.

**Copper Mining Situation.**—The Parrott and Gagnon are about the only big mines employing the usual number of men. If the present conditions continue for any length of time it must result in a curtailment of output. It is said that the smelters have on hand large stocks of manufactured material, notably at Great Falls, where it is claimed there is stored 25,000,000 lbs. of copper, although I have not been able to verify this latter statement. That the smelters who handle custom ore feel a little uncertainty regarding the market is shown by their not paying as much by 1c. to 1 1-2c. per lb. for the copper contents of an ore as they were willing to pay some weeks ago.

**Bell and Speculator.**—By an agreement of the parties to the litigation, the action involving these mines has been settled. The suit arose over apex rights, and has since been the cause of numerous

other complicated suits. The action was brought originally by the Anaconda Mining Company, the owner of the Bell Mine, against James M. Dougherty, and others, the owners of the Speculator nearly 10 years ago. By the agreement it is decreed that the apex of the vein crosses the boundary line common to the Bell and Speculator lodes, and that to the west of the crossing point the apex is in Bell ground, and to the east is in the Speculator.

**Black Hawk.**—This silver property is under bond to Victor Hoffman. Some bunches of very rich ore ruby silver and silver glance have been found recently in a shaft near the east line.

**Parrott.**—Judge Knowles, of the United States Court, has sent back to Judge Clancy's department of the District Court, the receivership and injunction suit of John MacGinnis and Daniel Lamm against this company. The case will come up before Judge Clancy on a motion to appoint a receiver for the Parrot Company on the ground that it violated the anti-trust law of the State by uniting with the Amalgamated.

**Rarus.**—Two 8-hour shifts are at work; one shift being off temporarily, it is said.

**Snow Bird.**—The Supreme Court recently granted the application of the Anaconda Copper Mining Company for an injunction restraining F. Aug. Heinze and others from working this mine in Butte, pending the appeal from an order of Judge Clancy, of the District Court. The appellant's bond was fixed at \$25,000.

**Stockton Copper Company.**—This company has abandoned work on its Broadwater County properties and is developing the Ida lode situated near Columbia Gardens adjoining the Altona. A 2-ft. vein of sulphide ore is reported to have been found. Two shifts of miners are at work and development is pushed.

## NEVADA.

## ELKO COUNTY.

**White Rock Placer Company.**—At this company's property bedrock is reported reached. The hydraulic machine was put to work about 6 weeks ago and the first clean-up is soon to be made. Salt Lake men are interested and W. D. Higginbotham is superintendent.

## HUMBOLDT COUNTY.

**Golden Eagle Mining Company.**—At the annual meeting officers and directors for the ensuing year were elected as follows: J. P. Megeath, president; J. W. Langley, vice president and treasurer; S. O. Snyder, secretary. These, with E. W. Whitney, C. E. Hudson and E. D. Miller, comprise the new board. The property is about 20 miles from Winnemucca.

## LYON COUNTY.

(From Our Special Correspondent.)

**American Exploration Company.**—This company with headquarters at San Francisco, through one of its subsidiary companies, the La Frieta Gold Mining Company, will have its new mill on Carson River near Dayton, Nev., completed and at work crushing ore from the Lizard Mine by November 1.

## NEW JERSEY.

**Empire Steel and Iron Company.**—This New York City company has decided to make extensive improvements in its iron mines at Mount Hope and Port Oram, and in its mines and furnaces at Oxford. Facilities will be provided for mining 250,000 tons of ore annually.

## NEW MEXICO.

## BERNALILLO COUNTY.

**Jura-Trias Company.**—This company has completed its copper smelter at Senorita. The company is mining its own coal from a 14-ft. vein.

## COLFAX COUNTY.

**Ora Dredge Company.**—This company at Elizabethtown completed its dredge 6 weeks ago. Three clean-ups are reported satisfactory, and the dredge is now working a full force. The dredge is lit by electricity, and has a searchlight. Another plant may be built this winter.

## GRANT COUNTY.

**Clifton Copper Company.**—This company has started its mill near Ernest Station, on ore from the Wild Cat Mine. The machinery comprises a crusher, rolls, 2 Huntingtons, 2 Wilfley tables, and 2 "Standard" concentrators. John L. Burnside is manager.

**Log Cabin.**—This claim near Santa Rita has been sold by Julius Wellgehausen to J. Ritter, of Pueblo, Colo., who has men at work cleaning out the shaft.

**Missouri.**—At this mine near Central, owned by St. Louis, Mo., men, a 14 h. p. gasoline hoist has been installed. W. U. McAllister is superintendent.

**Shakespeare Mining Company.**—Sheriff Goodell has sold under execution at Silver City the Eighty-Six, Emerald, Nevada and Buck claims, located in the Virginia mining district and owned by the company. They were bought in by the execution plaintiff, the Roberts & Leahy Mercantile Company, for the amount of the judgment and costs.

## SOCORRO COUNTY.

**Alcazar Copper Company.**—This company has filed incorporation papers, capital \$1,000,000. The company will work the Banner, Calumet, St. Marc, and Exchange mining lodes at Alcazar in the Chloride District.

## TAOS COUNTY.

The Red River placer mines have been sold to eastern men who will soon begin work.

**Coal Production.**—The annual report of the United States Mine Inspector shows that the total coal output of the Territory for the past fiscal year ending June 30, was 1,217,530 tons, with an estimated value of \$1,606,174, an increase of 30,196 tons over last year. Scarcity of miners restricted production. The number of mine employes is 1,870. There were 9 fatal accidents during the year.

**Red River Copper Company.**—This company at Red River received a new diamond drill, engine, and piping recently, and is starting work on the Anaconda group of copper claims. The company will also resume work on the old workings and push development. The company has taken a bond and lease on another copper property adjoining the Anaconda, owned by J. W. McCullom, formerly of Glorieta and Santa Fe.

## NORTH CAROLINA.

## ASHE COUNTY.

(From Our Special Correspondent.)

All the well known magnetic iron ore deposits of this county are being purchased by Richard Wood and associates of Philadelphia. A railroad is to be built in from West Virginia when sufficient tonnage will justify.

**Ore Knob.**—At this copper mine men are erecting a Garretton smelter plant and otherwise making ready for work on a large scale.

## CABARRUS COUNTY.

(From Our Special Correspondent.)

**Fritz Honeycut.**—This gold mine, adjoining the Whitney Reduction Company's mine, has been sold for \$12,500 to that company, which will develop it by a drift from their 500-ft. level. The Whitney company has made surveys, and will erect a large reduction works on the Yaddin River, where it is preparing to develop 40,000 h. p., to be transmitted to the adjacent towns of Salisbury, New London, Albemarle and Charlotte.

## ROWAN COUNTY.

(From Our Special Correspondent.)

**Gold Hill.**—At this copper mine the water is kept down to the 500-ft. level in anticipation of resuming operations. The mine has thousands of tons of gold-copper ore exposed. It is reported that the president, Walter G. Newman, is expected at once.

**Union Copper Company.**—This company, under the management of Carl Henrich, is turning out high grade copper-gold matte, which is shipped north. James McCormick, formerly of Pride of the West Smelter in Arizona, is in charge of the furnaces. Captain W. Murdock Wiley is the financial agent.

## STANLEY COUNTY.

(From Our Special Correspondent.)

**Parker.**—This gold mine is to be opened by local men, who will develop a large vein of ore that shows well in gold.

## PENNSYLVANIA.

## ANTHRACITE COAL.

**Dickson.**—This shaft, of the Delaware & Hudson Company, at Scranton, has shut down temporarily to permit extensive mine and breaker improvements. The company will furnish the employes work at its adjoining mines so far as possible.

**Dodge.**—This colliery, near Scranton, is about to resume work after 3 months' idleness. New screens, elevators and conveyors have been put in place. An electric motor in the mine will do away with hauling by mules. A new boiler plant is nearing completion, from which steam will be supplied to both the Dodge and the Bellevue collieries. There are 5 batteries or 20 boilers. This plant will take the place of 2 old plants.

**Pettebone.**—Ground has been broken and plans drawn for the erection of a large washery at this colliery of the Delaware, Lackawanna and Western Company, near Wilkes-Barre.

**Pine Brook.**—This colliery near Scranton has resumed work.

**Pond Creek Coal Company.**—New York men are negotiating for this company's property near White Haven. The present small breaker will be enlarged in case the deal goes through.

**West Shenandoah.**—At this colliery of the Philadelphia & Reading Coal and Iron Company the new breaker is completed and 10 tubular boilers are in place. The trestle from the slope to the breaker is

finished and the rope haulage to connect with the Turkey Run Colliery is nearly ready.

#### BITUMINOUS COAL.

**Shoenberger Coal Company.**—Captain Alfred Hicks, president of the Allegheny Iron and Steel Company, and W. A. Lewis, of Pittsburg, have sold the property and charter of the company to J. W. Baillie, of McKeesport, H. A. Kuhn and D. W. Kuhn, of Pittsburg, and a Boston syndicate that will shortly reorganize the company. The consideration was \$240,000. H. A. Kuhn is a mining engineer. The company, as operated by Capt. Hicks and Mr. Lewis, owned 600 acres a few miles beyond Monongahela City on the Monongahela River, on the Pittsburg, Virginia & Charleston Railroad. A plant of modern mining machinery was in active operation before the sale to the new syndicate. The property extends  $\frac{3}{4}$  of a mile along the river. The coal is in a 6-ft. seam.

#### UTAH.

(From Our Special Correspondent.)

**Bullion and Ore Settlements.**—The settlements at Salt Lake for the week ending October 19 are: Gold cyanides, \$16,700; gold, silver, lead and copper ore, \$290,801; Germania Smelter bullion, \$67,900.

#### BOX ELDER COUNTY.

**Brooklyn Mining Company.**—This company is putting up buildings and has started work on its tunnel, where work is to be pushed all winter.

**El Amigo.**—The tunnel is being pushed as rapidly as possible by Superintendent William Dix.

**Gold Standard Company.**—This company has begun operations. During the winter the ledge will be opened through a tunnel to be driven under the direction of D. E. Young, formerly foreman at the Brooklyn Mine at Bingham. W. H. Weyher is manager at Park Valley.

#### GRAND COUNTY.

**Tornado.**—Through Sam N. King, Judge J. W. Burton has closed a deal for the purchase of this and the Indiana properties on Mineral Mountain, in the La Sal District, the vendor being M. I. Fowler, of Basin. The first payment on the \$16,000 purchase price has been made, and development will begin at once.

#### GRAND COUNTY.

(From Our Special Correspondent.)

The La Sal region continues to attract attention. At Miners' Basin are the Green Mountain, Tornado, High Ore, Sunrise, Iowa and Corsair, which are all gold producers. In Beaver Basin the International Copper Company has let a contract for a 20-stamp mill with improved concentrators.

#### IRON COUNTY.

**Johnny Gold Mining Company.**—President C. O. Newell, of Stateline, has sold his 70,000 shares in this corporation to Messrs. W. J. Halloran and F. D. Clift, of Salt Lake. Final payment on the purchase will not be made for a few weeks, and pending the closing up of the transaction Mr. Newell will remain at the head of the company, that is now preparing to sink to the 300-ft. level.

#### JUAB COUNTY.

**Carisa.**—The main workings of the mine are on the 250-ft. level, but a winze had been sunk 35 ft. below that, where a drift had been sent out 92 ft. through a body of ore.

**Eagle & Blue Bell.**—At the annual meeting of this Tintic company secretary and treasurer W. R. Wallace's report showed that the company had run behind during the 12 months \$4,392.92. Counting the indebtedness that was outstanding one year ago, the company now owes \$15,806. It cost to run the mine during the year \$13,578, and \$7,576 worth of ore was sold, while \$1,070 was realized from the sale of treasury stock, making the total receipts \$8,647. There are still 6,750 shares of stock in the treasury. During the year a new level below the tunnel, the 400, has been opened and some very fine ore has been struck. The old board of officials was elected, as follows: Sara A. McChrystal, president; J. H. McChrystal, vice-president; W. R. Wallace, secretary and treasurer; these, with J. C. and A. H. McChrystal completing the board.

**Humbug.**—The deal involving the south half of the Humbug, and other property belonging to the Uncle Sam Consolidated Company is off. Dr. Franklin, it is stated, let the matter drop on account of ill health.

**Wabash.**—The triple compartment shaft on the Park City property is down 35 feet, and the buildings are under way. The Wabash is operating about 2,000 ft. south of the Ontario hoisting works, and the new shaft is to be put down to a depth of 600 ft. before cross-cutting starts.

(From Our Special Correspondent.)

**Tintic Ore Shipments.**—Forty cars of ore were shipped in the week ending October 18th, as follows: Ajax 1, Carisa 8, Eureka Hill 11, Godiva 3, Lower Mammoth 2, Mammoth 1, May Day 4, Star Consoli-

dated 2, Tesora 4, Utah 1, Yankee Consolidated 3; also 4 cars of concentrates from the Tesora Mill.

#### SALT LAKE COUNTY.

**New England-Utah Mining Company.**—This Chicago, Ill., company has been incorporated at Dover, Del., with a capital stock of \$1,000,000. Ex-Postmaster-General Don M. Dickinson, is the president of the corporation, which has acquired lands near Bingham, adjoining that of the United States Company, known as the Last Chance property. The directors are: Don M. Dickinson, ex-Senator R. R. Kenny, of Delaware, John J. Abbott and others.

#### SUMMIT COUNTY.

**West End Mining Company.**—For approximately 100,000 of the 107,000 issued shares in this company, John Rhoden has paid \$25,000 and is in possession of the property. The ground comprises 6 patented claims that adjoin the Jupiter and Silas Reed groups on the southwest, and covers the divide between Uintah and Big Cottonwood Districts. Over 800 ft. of tunneling was done by the early owners. A force of men is now putting the buildings in shape for winter.

#### UINTAH COUNTY.

**Bromide Mining Company.**—This company is hiring teams to work at its property on Douglas Mountain. It is the intention of the management to start up the smelter in the near future.

**Dyer.**—This smelter, near Vernal, recently completed a 7 days' run, the result being 108,000 lbs. of copper bullion.

#### BEAVER COUNTY.

(From Our Special Correspondent.)

**Cactus.**—This group of copper claims near Frisco has been acquired by Samuel Newhouse for \$200,000, a check for which was passed through McCornick & Co.'s bank at Salt Lake City, on October 19, to the representatives of Demochy & Seilliere, the Paris bankers. In addition a check for about \$90,000 passed to the owners of the large springs in Wah Wah Valley; the springs are believed to furnish water for a concentrating mill of 1,000 tons capacity.

#### MILLARD COUNTY.

(From Our Special Correspondent.)

The mines claimed to have been worked by the Spaniards long ago, near Kanosh, are being opened by a Boston company of which Dr. Charles E. Watkins is president. From the old stopes small pieces of ore showing free gold and tellurium have been taken. A tunnel now in 70 ft. is expected to cut the lowest chamber in 30 ft. more. Several small streaks of ore have been cut.

#### SUMMIT COUNTY.

(From Our Special Correspondent.)

**Park City Shipments.**—The ore shipments during the week ending October 19 are as follows: Daly West, 1,390,000 lbs.; Quincy, 1,350,000; Ontario, 955,000; Anchor, 265,000; California, 120,000; Daly, 65,000; Barnes Bros., 50,000; Silver King, 1,259,300; total, 4,314,300 lbs.

#### WEST VIRGINIA.

**Braxton Coal Company.**—United States Senator Elkins, R. C. Kerns and Fairfax Landstreet, of the Davis-Elkins coal interests, have been at Parkersburg to close a deal for 25,000 acres of coal lands situated in Gilmer, Braxton and Lewis counties and owned by this company, for which they paid \$500,000. This gives the Davis interests nearly 40,000 acres of coal land in the Parkersburg section.

#### WYOMING.

#### LARAMIE COUNTY.

**Sunrise.**—Ore from mines of the Colorado Fuel and Iron Company at Sunrise is being handled by the Burlington Railroad.

#### UINTAH COUNTY.

**Tully Copper Mining Company.**—This company has men at work on its property near Pearl. A shaft house 24 by 36 ft. is being erected, and a whim will be installed. Five new claims have been added to the Tully group, making 10 claims in all. J. D. Tully is superintendent.

### FOREIGN MINING NEWS.

#### SOUTH AMERICA.

#### BRITISH GUIANA.

**Gold Production.**—The Mines Department reports the gold production of the colony in September, on which royalty was paid, at 8,683 ox. The total in September, 1900, was 9,499 ox.; showing a decrease of 816 oz. this year.

**Diamonds.**—A parcel, said to contain 160 diamonds, has been received at Georgetown by Mr. L. Henery, representative of the syndicate which is exploring the Massaruni field.

#### AFRICA.

#### CAPE COLONY.

**De Beers Consolidated Company.**—Announcement is made of the plan for readjustment of the capital stock of this company, which is to be submitted to a

meeting of the stockholders to be held in Kimberley shortly. The present capital stock is £3,950,000, divided into 790,000 shares, of £5 par value. The new stock will be £4,500,000, divided into 800,000 shares of preferred stock of £2 10s. par value, and 1,000,000 shares of deferred or common stock of the same par value. This will make £2,000,000 preferred and to £2,500,000 common stock. The preferred stock will be entitled to dividends of 40 per cent yearly, while the common stock will receive the profits in excess of the preferred dividend. The new stock, it is understood, will be divided as follows: To holders of present stock, 790,000 preferred and 790,000 common shares in exchange for their present stock, and 50,000 common shares as a dividend; to reserve for future use, 10,000 preferred shares; to the life governors, 160,000 shares in exchange for their present rights, under which they are entitled to 25 per cent of the profits in excess of 36 per cent on the stock. This purchase of the life governors' rights will settle a question which has been under discussion for several years.

It is reported that contemporaneously with the new arrangement the conditions between the company as a producer and the syndicate that has contracted to take the diamonds produced over a series of years has been modified, and that the De Beers Company will, after a certain percentage of profit has been made by the diamond-purchasing syndicate, receive one-half of any surplus profit of the syndicate.

There are also reports that negotiations are nearly completed for the purchase by the De Beers Company of the Jagersfontein Mine, the only diamond mine of considerable value in South Africa outside the De Beers' properties.

#### NATAL.

**Coal Production.**—The Mines Department reports that in August there were 14 collieries in operation, employing 175 white men, 1,208 East Indians and 2,118 negroes; a total of 3,501 persons, of whom 1,147 worked on the surface and 2,345 underground. The total coal raised was 50,353 tons. The Natal coal exported and sold to steamers at Durban was 25,077 tons.

#### RHODESIA.

**Gold Production.**—The report of the Rhodesia Chamber of Mines shows that in August there were seven companies operating mines, four in Matabeleland and three in Mashonaland. In the 7 mills there was a total of 160 stamps, while two companies operate cyanide plants. The total tonnage of ore crushed was 20,327 tons; of tailings cyanided, 4,424 tons. The total product was: From mill, 13,658 oz.; from tailings, 1,076 oz.; total, 14,734 oz. gold bullion. The total output for the eight months ending August 31st was: 111,940 oz. gold bullion, which compares with 51,831 oz. for the corresponding period in 1900, showing an increase of 50,109 oz. The total this year was equal to 91,791 oz. fine gold, or \$1,897,320.

#### TRANSVAAL.

**Gold Production.**—The Transvaal Chamber of Mines reports the gold production of the working mines in September at 31,936 oz. fine. The total for the five months since work was resumed in May has been 113,626 oz. fine gold, or \$2,348,649.

**Geldenhuis Deep, Limited.**—This company reports that for the month of September there were 60 stamps in use in the mill, running the full 30 days. The ore worked in the mill was 7,726 tons; concentrates cyanided, 5,768 tons; slimes located in slimes plant, 2,326 tons. The total yield was, in fine gold: Mill, 2,584 oz.; cyanide works, 1,070 oz.; slimes plant, 212 oz.; total 3,866 oz. The average return was therefore 0.5 oz. to the ton milled. The average work done per stamp per day was 4.29 tons.

#### MEXICO.

#### CHIHUAHUA.

(From our Special Correspondent.)

**Dragoon Mining Company.**—This company's mines at Terrazas, are reported averaging 50 tons daily, and with a steam hoist, which has been ordered, the quantity will be increased.

#### COAHUILA.

(From Our Special Correspondent.)

**Jimulco District.**—This copper district is attracting much attention and important transactions are pending.

#### DURANGO.

**Avino.**—Word from these mines is that another large body of high grade copper ore has been struck.

**Mexican Mining and Smelting Company.**—This company has been incorporated under the laws of the State of New York with a capital of \$10,000,000, to operate mines in Durango. The principal offices of the company will be in New York City. The directors are: Thomas H. Watkins and Clarence D. Simpson, of Scranton, Pa.; Walter B. Devereaux, J. Roger Maxwell, Thomas B. Manson, Samuel P. Peters, William B. Stow, Henry H. Hollister and Girard C. W. Bowrey, of New York City, and E. Cooper Shapley and Charles F. Jones, of Philadelphia. Henry



H. Brady, Jr., of Scranton, subscribes for \$9,850,000 of the stock.

NUEVO LEON.

(From Our Special Correspondent.)

There is great activity at the site of the new steel works. The plant is fast nearing completion. Work on the railroad to the so-called iron mountain has begun.

**Compania Fundidora y Afinadora.**—This Monterey company, commonly known as Smelter No. 2, has recently installed the Moebius system of separating its gold and silver. The plant is at present producing a 1-2 ton of pure silver per day, which is sold to the Mexican Government.

**La Grand Fundicion Nacional Mexicano.**—This plant at Monterey, a part of the American Smelting and Refining Company, is now working full blast.

**La Voladora.**—This mine on Mitre Mountain near Monterey, which was recently sold to the Torreón Smelting Company, has opened up large bodies of fine smelting ore and is putting in an overhead cable to connect with the Mexican International Railroad.

**Norias de Bajou.**—This Monterey mine is keeping up its shipments of high grade silver-lead ores, and is said to be paying \$40,000 per month.

**San Antonio.**—F. W. Leedom has recently reopened this mine, which in past years was one of the heavy producers of the Monterey District.

**San Pedro Mines.**—The company operating these silver-lead producers is changing its overhead cable to a gravity system. The mines are 12 miles from Monterey, on the Mexican National Railroad. The output is sold to the Guggenheim plant of the American Smelting and Refining Company.

SONORA.

A fine deposit of mica is reported located in the Altar District, by Richard Johnson.

**La Fortuna.**—Work on this property at La Colorado, purchased by the Creston-Colorado Company, is being done preparatory to stoping ore to hoist through the Creston shaft.

MINING STOCKS.

Complete quotations will be found on pages 544 and 545 of mining stocks listed and dealt in at: Boston. San Francisco. Montreal. Colo. Springs. Soc.ane. Mexico. New York. London. Paris. Philadelphia. St. Louis. Toronto.

New York Oct. 25.

Speculation in the copper group has quieted down. On Monday Amalgamated was up to \$92½, but later sold down to \$89½, and on Wednesday, when stock offered—it was reported by insiders—the price fell to \$88, and closed weak. Anaconda has not changed much, and sales were small at about last week's closing prices. On curb there have been sales of Tennessee copper at \$14, White Knob, \$14; British Columbia, \$14½, and Union, of North Carolina, at \$14½. The sales were about 500 shares each.

Utah silver stocks show steady investment buying. Trades in Ontario have been made at \$11½ @ \$11¾. The company has just declared a 30c dividend, payable in December, making this year's distribution \$90,000, the same as last year. Horn Silver has advanced to \$2, and closes strong.

In the California section Standard Consolidated is supported at \$4, while large sales of Brunswick are forced at 11@12s. Transactions in quicksilver common are noted at \$4@4¼, while the preferred is featureless at \$10@10½, as holders are not willing to sell in anticipation of further dividends.

The Cripple Creek, Colo., shares have been strengthened by reports of a better gold output and a rich strata in the Elkton property. Isabella is up to 48c in sympathy with the Western market, and also owing to the decision of the company to lease a portion of its property. Bids for Elkton are made around \$1.70, with no offers, as the uncovering of a rich chimney promises a continuance of the quarterly dividends. The company is now paying 12 per cent annually. Small sales of the Leadville stocks have been made at fair prices. Of these, Breece, a 5c quarterly dividend stock, rose from \$1.25 to \$1.30.

The Comstocks—those that have collected the bulk of their regular assessments—are higher. Consolidated California and Virginia sold at \$1.85@1.95, and Ophir at 85@92c.

At auction, 50 shares of Doe Run Lead Company, Mo., sold at \$125 per share. This stock pays 6 per cent in dividends annually. The company has distributed altogether \$477,072, or nearly 48 per cent on its capital stock. Other sales were \$100 first mortgage income bonds scrip of the Comstock Tunnel Company at \$10, and 100 shares of the stock at \$7; 5 shares Stony Creek Red Granite Company (\$100 par) at \$1; 100 shares Summit Branch Railroad (\$50 par), and 600 shares Casco Consolidated Mining Company (\$10 par) at \$1 for lot; 12,500 shares

Huuden Fortune Gold Mining Company (hypothecated) for \$150.

Boston

Oct. 23.

(From Our Special Correspondent.)

The market for copper shares continues discouraging. There were symptoms of a better condition of affairs late last week, but they soon faded away. Considerable inspiration was derived from the sharp advance in Amalgamated Friday and Saturday last, but this was soon dispelled, and the market is again dragging along in a monotonous way. Thus far Mr. Rogers' visit to Boston has resulted in a very incipient boom.

Some significance was given Lawson's utterances Saturday, in which he claimed there was no fight on between himself and the Standard Oil people, and that all was harmony; but somehow even Boston people are skeptical of points from this source. However, the sharp traders are ever ready to bid up stocks, while the public enjoys the spectacle. Commission houses are doing little except in a few stocks.

Reports are current that Calumet & Hecla has been marketing copper at 16½c. In many quarters the continued weakness of the share market is looked upon as presaging a cut in copper sooner or later. A great many people have liquidated their stocks, believing that by January 1 Amalgamated Copper people will yield a point and meet the conditions as they exist.

Atlantic took a spurt to above \$40 on reports that a strike had been made on Section 16 of this property, but the movement soon lost headway on denials from President Stanton. Arcadian continues to hover just above \$6, and it is thought that some large holder is lightening his load. President Burrage has been at the property this week. Reports were current that the mill would be shut down as a result of his visit. There is quite a request for Guanajuato, and some strong houses are noted as buyers around \$7.50. Treasurer Cogswell, who was here last week, states that the company is netting about \$1,000 per day from the ore being shipped to the smelters. The company expects to have 60 stamps operating early next year.

The plan for consolidation of Copper Range, Trimountain and Baltic has not materialized as yet, although it has been promised for many months. Evidently its promoters are awaiting a favorable market before launching it. Copper Range moved up to \$63½, but hovers around the \$60 mark. Baltic and Trimountain sell together at \$41. As proposed, these will go into the consolidation in the ratio of 1½ shares each of Baltic and Trimountain for 1 of Copper Range.

The New England Exploration Company is a Boston enterprise, owned principally by Calumet & Hecla officials. One of its properties is the Smuggler-Union Mining Company. For the year ended April 30 this company earned \$1,125,759 gross, and carried \$23,865 over after all charges and dividends. The company had \$58,796 cash on hand April 30. The company was handicapped last year by a strike in the early Summer.

Another reminder of the zinc mining boom of 1898 and 1899 is that the Boston & Little Circle Zinc Company has leased its property for 10 years at a royalty of 10 per cent. A shrinkage in the capital has been made from \$1,000,000 to \$100,000 by reducing the par from \$10 to \$1.

San Francisco

Oct. 19.

The market has been fair this week, with trading a little more active, and no further drop in prices. There was no special incident to affect business, but some stiffening up was apparent. The special demand was for the North End Comstocks, and Consolidated California & Virginia brought \$1.85; Ophir, 87c.; Mexican, 20c.

Some other quotations noted are: Caledonia, 30 to 31c.; Sierra Nevada, 19c.; Hale & Norcross, 18c.; Chollar, 8c.; Crown Point, 7c.

The financial statements of the mining companies, as filed according to law, show cash on hand October 1, as below, with all expenses paid up to date, unless otherwise noted: Alta, \$52, with debts amounting to \$2,752; Andes, \$1,717; Alpha Consolidated, \$897; Belcher, \$785, with September expenses partly unpaid and debts amounting to \$7,415; Best & Belcher, \$5,460; Bullion, \$31; Caledonia, \$12,395, with September expenses unpaid; Confidence, \$1,686, with September expenses unpaid; Chollar, \$2,913; Crown Point, \$78, with September expenses unpaid and a debt of \$1,000; Consolidated California & Virginia, \$54,971; Consolidated New York, \$16; Consolidated Imperial, \$1,329; Challenge Consolidated, \$520; Exchange, \$243; Gould & Curry, \$862, with liabilities amounting to \$14,962; Hale & Norcross, \$4,134; Justice, \$1,441, with liabilities of \$6,455; Mexican, \$3,374; Ophir, \$6,348; Overman, \$4,381, with September expenses unpaid; Potosi, \$997, with \$1,000 indebtedness; Savage, \$4,408; Silver Hill, \$15,241; Segregated Belcher, \$23; Sierra Nevada, \$4,831; Standard Consolidated, \$150,355, with September expenses unpaid and September clean-up not completed; Syndicate, \$3,280; Union Consolidated, \$7,260; Utah

Consolidated, \$201.

The following companies have assessments in process of collection: Andes, Bullion, Confidence, Chollar, Crown Point, Challenge Consolidated, Gould & Curry, Potosi, Savage and Union Consolidated—10 in all.

On the Producers' Oil Exchange trading was better and buyers showed more interest. Prices were generally firm. Some quotations noted are: San Joaquin Oil and Development, \$8; Thirty-three, \$7; Peerless, \$5 to \$5.50; Home, \$3.45; Monte Cristo, \$1.65; Twenty-eight, \$1.60; Sterling, \$1.35; Reed Crude, 42c.; Four Oil, 40c.; Oil City, 25c.; Monarch, 21c.; Lion, 7 to 8c.

The heaviest business done was in Sterling, Reid Crude, Oil City, and Peerless, with a special demand for the last named stock.

Paris

Oct. 13.

(From Our Special Correspondent.)

The temporary scarcity of money, which has affected speculation, has almost passed away. It was not due to any lack of actual funds, for the balance at the Bank of France continues enormous, but to lack of confidence and to temporary demands from London and Berlin.

There are, however, two influences depressing the market, and affecting speculation in mining and metallurgical stocks unfavorably.

The first of these is the great depression in Russian shares, which are held here so largely. The industrial crisis in the Empire has told very heavily on the Russian companies, which have been financed from Paris and Brussels. These shares are now depressed as unreasonably as they were at one time inflated. To show the losses of investors, I give below the quotations of a few of the more prominent in January, 1900, and at the present time; some of them are coal, and others iron and steel companies:

	Jan., 1900.	Aug., 1901.	Fall.
Almaznala	Fr. 895	Fr. 390	Fr. 505
Donitz Steel	1,475	708	767
Briansk, steel	1,485	550	935
Nicolaeff	1,320	215	1,105
Drieptovienne	4,450	2,180	2,280
Dombrowa	1,165	957	908
Huta-Bankova	4,525	3,622	3,638
Haut-Volga	605	60	635
Krivoi-Rog	2,785	1,590	1,195
Ouvai-Volga	700	40	600
Rakhmanovka	850	110	740
Sud-Russe	1,290	570	720
Volga-Vichera	412	73	339

The list might be much extended; but the instances given will suffice.

The other influence affecting the market unfavorably, the possibility of a general strike of the coal miners. Whether this will take place is still uncertain. It is sure, however, that serious trouble is impending at Montceaux-les-Mines, and the outbreak there may bring on the general movement. The latter will necessarily disorganize industry and have most disastrous effect upon trade and on the Bourse.

The movement of gold and silver in France for the 8 months ending August 31 is reported by the Ministry of Commerce as below:

Gold:	(Imports.)	(Exports.)	(Excess.)
	Francs.	Francs.	Francs.
1901.....	235,089,000	54,371,000	Imp. 180,718,000
1900.....	321,736,000	40,962,000	Imp. 280,774,000
Silver:			
1901.....	69,903,000	94,698,000	Exp. 24,763,000
1900.....	119,469,000	135,769,000	Exp. 16,300,000

The imports of nickel and copper coins, taken at their face or coinage value, were 76,000 fr. this year, and 41,000 fr. to the corresponding date in 1900. Exports of such coins were 236,000 fr., against 245,000 for last year.

The report that a new Russian loan would be placed here has been promptly denied, which does not prevent many people from believing it. AZOTE.

ASSESSMENTS.

Name of Company.	Location.	No.	Delinq.	Sale.	Amt.
Alblon	Utah	2	Oct. 11	Oct. 29	.05
Badger	Ore.	4	Nov. 6	Nov. 30	.05
Bullion	Cal.	59	Oct. 24	Nov. 14	.03
Century Oil	Cal.	5	Oct. 19	.....	.05
Horseddy	Cal.	..	Nov. 12	.....	.10
Challenge Con.	Cal.	32	Oct. 21	Nov. 12	.05
Crown Point	Cal.	83	Oct. 9	Oct. 30	.05
Goleta Con.	Cal.	3	Oct. 30	Nov. 28	.10
Gonyon	Utah	..	Nov. 1	Nov. 22	.00 1/4
Gould & Curry	Cal.	98	Oct. 22	Nov. 11	.10
Marina Marcellano	Cal.	25	Oct. 14	Nov. 4	.01
Mariposa Com'l & Mg.	Cal.	24	Oct. 21	Nov. 11	10.00
Nugget Placer	Cal.	1	Oct. 14	Nov. 7	.10
Oseola Con.	Cal.	12	Oct. 5	Oct. 28	.01
Mountain View	Cal.	..	Nov. 8	.....	.01 1/2
Thorpe	Cal.	11	Nov. 16	Dec. 9	.01
Savage	Cal.	104	Oct. 8	Oct. 29	.10
Sharp	Utah	4	Nov. 11	Dec. 2	.00 1/4
Tamara	Cal.	..	Nov. 4	.....	.10
Utah Oil	Cal.	1	Oct. 11	Oct. 29	.02
Union Con.	Cal.	62	Oct. 10	Oct. 29	.10
Yellow Jacket	Cal.	9	Oct. 22	Nov. 27	.10

DIVIDENDS.

Name of Company.	Latest Dividend			Total to date.
	Date.	Per share.	Total.	
Aberdeen Cop...N.M.	Nov. 4	\$1.00	\$32,175	\$32,175
Alaska-Treadwell	Oct. 28	.37½	75,000	4,820,000
Allis-Chalmers, pf.	Nov. 1	1.75	284,375	568,750
Amalgamated Cop.	Oct. 28	1.50	2,308,319	15,869,491
Calumet & Hecla, Mich.	Oct. 31	15.00	1,500,000	71,350,000
Com. Mercur, Utah	Nov. 1	.12½	125,000	485,000
Flat Top C. Land Assn.	Nov. 1	1.00	37,141	352,840
FL. Top C. Land A. pf.	Nov. 1	1.00	37,141	2,098,450
San Carlos Minillas	Oct. 31	6.86	17,150	1,778,860
Ontario Silver, Utah	Dec. 20	.30	45,000	14,737,500
Gwin, Cal.	Oct. 15	.05	5,000	261,000
Ingham Con., Col.	Oct. 28	.00½	3,393	37,389
Int'l Steam Pump, pf.	Nov. 1	1.50	132,750	1,194,750
Pacific Coast Borax	Oct. 30	1.00	19,000	952,500
Parrot Copper	Oct. 28	1.00	229,850	5,658,000
Shawmut Oil	Nov. 1	.50	25,000	100,000
Sta. Mar. de Guadalupe	Nov. 10	4.58	11,450	281,375
Home Oil, Col.	Oct. 21	.07½	7,500	245,000
Union Mill, Mexico	Oct. 8	2.29	4,580	346,080
Rambler-Carliso, B. C.	Oct. 30	.01	12,500	130,000
Town Topics, Colorado	Nov. 1	.00½	5,000	15,000
U. S. Steel, com.	Dec. 20	1.00	5,082,347	10,142,462
U. S. Steel, pref.	Nov. 6	1.75	8,929,049	17,824,962
West Shore Oil, Cal.	Oct. 31	.05	5,000	10,000
Penn. Steel (new, pf.)	Nov. 1	3.50	577,500	577,500

\*Monthly. †Quarterly. ‡Semi-Annual.

COAL TRADE REVIEW

New York Anthracite

Oct. 25.

The anthracite coal trade continues to show conditions that must be very satisfactory to producers. Coal is selling at full list prices, with no prospect of any break in quotations for months. Demand in the West is calling for a very heavy tonnage, and the movement of coal at Eastern points, considering the large amounts taken by dealers last spring and in the early summer, is certainly encouraging.

In Lake Superior territory receipts of coal are not what were expected some weeks ago. The close of navigation is but about a month away, and the outlook for enough coal being rustled forward to prevent a shortage this winter is very poor. In Chicago territory retail demand has improved. The arrivals of all rail coal are light, as is the movement to inland points. The car famine is the cause. At lower Lake points and in Canadian territory trade is active. Along the Atlantic seaboard demand is naturally better than it was a month ago, and the movement of coal is steady enough to take all the output of the collieries that is not wanted in the West. Pea coal is the size most difficult to get for prompt delivery. The October list prices for free-burning white ash, f. o. b., New York Harbor shipping ports are: Broken, \$4; egg, \$4.25; stove and chestnut, \$4.50.

BITUMINOUS.

The Atlantic seaboard soft coal trade shows no slackening of the heavy demand that has been the marked feature of the past 2 weeks, and dealers are still unable to meet the requests of consumers. Car supply, which now varies around about 50 per cent of the tonnage wanted at the mines, is the chief factor in the situation. Were car supply sufficient the present pressure on producers might be fully relieved. All producers are after the main line roads for more cars, but their efforts seem likely to have little effect, as the general feeling is that the present car famine is widespread and enough cars simply cannot be had. It is thought that the market situation is somewhat exaggerated by consumers, giving the same orders to different concerns in the hope of getting some coal anyway, but this duplication of orders does not offset the undoubted urgency for coal.

Trade in the far East is taking a good tonnage, but consumers there, on account of large arrivals at the shipping ports late in September and early in October, are thought to be better off than those at points west of Cape Cod. Along Long Island Sound demand is very heavy, and none of the shippers are apparently unable to meet all requests from that territory. New York Harbor trade is active and is receiving about all the coal needed. Shippers are slightly behind in deliveries. There are some shoppers going around in this district who seem to have trouble in getting just the grades they want. All rail trade is very active, and most producers have ordered their agents to postpone orders from this trade as far as possible.

Transportation from the mines to tidewater is fairly good. Car supply at the mines is about half of what most producers need. In the coastwise vessel market there is a great fleet of vessels to eastward, and the tidewater shipping ports are reporting no vessels, while coastwise freight rates remain firm. We quote as follows from Philadelphia, Providence, New Bedford and the Sound, 60c.; Boston, Salem, Portland and Portsmouth, 70c.; Wareham, 85c.; Lynn, 80c. @ 85c.; Newburyport, 85c. @ 90c.; Bath, 75c.; Bangor, 90c. @ 95c.; Gardiner, 80c., and towages; Saco, \$1, and towages; Dover, \$1.15, and towages.

Prices for the higher grades of coal are full circular figures, and outside buyers are paying premiums of 10c. per ton more. The poorer grades of Clearfield, which were selling at \$2.35 f. o. b. New York

Harbor shipping ports in the early Summer, now being from \$2.45 to full list price. There have been a few cases of coal sold at low prices lately, but these were due to individual conditions not connected with the market.

Birmingham, Ala.

Oct. 21.

(From Our Special Correspondent.)

There is considerable activity in coal circles in Alabama and much of the product is being mined. The railroads are now finding a little difficulty in furnishing all the cars demanded for a prompt removal of the product from the mines and there is some complaint as to the scarcity of cars. During the past week the Alabama Consolidated Coal and Iron Company acquired the properties of the Mary Lee Coal and Railroad Company, located about 5 miles from Birmingham. The Alabama Consolidated Company has owned a controlling interest in the properties for more than two years but litigation has kept its development back. The property is now cleared of all encumbrances. There are more than 3,000 acres of coal lands and the mines have a capacity now of 500 tons a day. The 130 coke ovens have a monthly output of about 4,000 tons of coke. There is a large coal washer, besides houses for employees and a railroad line 4 miles in length. This acquisition brings the possessions in coal lands of the Alabama Company up to nearly 40,000 acres. It will now have an output of about 500,000 tons of coal and 225,000 tons of coke yearly.

Cleveland, O.

Oct. 23.

(From Our Special Correspondent.)

The coal trade has been very dull during the week. The lake shippers have been struggling with a car shortage, and are not able to accomplish much in the way of getting their material up the lake. Some have reported a slight relief from the strenuous conditions, while others make the assertion that the situation is worse rather than better. The best report that has been made this week is that a shipper or so is able to move about 66 per cent of the normal amount, while others report that they cannot get half of the coal they ought to have. This is compounding the situation for the latter part of the season of navigation, and already owners are beginning to talk of better rates to be received when the shippers shall have received their supply of material. Not much relief is in sight for the railroads are not offering any better car supply for two or three weeks.

The movement of domestic coal is extraordinarily heavy, and the dealers are experiencing the same delay due to car shortage as is seen in the lake trade. The extraordinarily heavy business along manufacturing lines is naturally creating an enormous demand for fuel, and the business is brisk. The Ohio Coal Traffic Association held a meeting in this city during the week and talked over rates. No changes were made. The members, however, agreed to maintain tariffs on coal into Michigan territory about which some dispute arose a short time ago, as one or two roads were doing some secret cutting.

Pittsburg

Oct. 23.

(From Our Special Correspondent.)

Coal.—The demand for coal is increasing and the combinations and independent producers are crowded with orders. As a result prices are firmer than at any time during the year. Independent operators who have been shading prices during the past two months are now quoting the same prices established by the Pittsburg Coal Company. Some contracts were placed in the Pittsburg District this week by Chicago concerns, who formerly secured their entire supply from West Virginia and Ohio fields. There is still a shortage of railroad cars, which is retarding shipments. Despite this fact reports indicate that the output from this district will be much heavier than any former year. It is estimated roughly that the shipments so far this year exceed those of the first 9 months of last year by probably 1,000,000 tons. The combination and independent companies are adding to their equipment of individual railroad cars. The new shops of the Pittsburg Coal Company, at Montour Junction, 13 miles from this city, are completed, and will be put in operation on November 1. Railroad and mining cars are to be built at these works, and in addition repair work on cars and locomotives is to be conducted.

Connellsville Coke.—There was an improvement in the coke trade last week. The production was about 9,000 tons greater than the previous week, and the shipments were heavier. Prices are firm but unchanged. Standard Connellsville coke is quoted at \$2 for furnace and \$2.50 @ \$2.75 for foundry. Of the 21,733 ovens in the region, 19,463 are active, and 2,270 are idle. The shipments for the week aggregated 11,096 cars, distributed as follows: To Pittsburg and river tipples, 4,015 cars; to points west of Pittsburg, 5,000 cars; to points east of Connellsville, 2,081 cars. This was an increase of 196 cars compared with the shipments of the previous week.

Foreign Coal Trade

Oct. 25.

Inquiries for coal for foreign shipment continue to be received. As usual, the main question is the rates at which vessels can be secured. The shipments to Germany, noted last week, are exciting much interest, and the results will be looked for anxiously. As noted on another page the general strike of the coal miners in France is postponed for the present.

Exports of coal—including coke and briquettes—from Great Britain for the nine months ending September 30 are given by the Board of Trade returns as below, in long tons:

	1900.	1901.
Russia	2,712,714	2,145,599
Sweden and Norway	3,281,629	3,065,557
Denmark	1,536,669	1,594,963
Germany	4,425,454	4,388,771
Holland	1,439,143	855,768
France	6,268,444	5,816,283
Spain and Portugal	2,447,672	2,578,503
Italy	4,006,826	4,206,983
Other countries	8,216,372	8,247,403
Total	34,332,923	32,879,830
For steamers in foreign trade	8,753,829	10,050,070
Total	43,086,752	42,929,900

The decrease in exports was 1,453,093 tons, or 4.2 per cent; the increase in shipments for the use of steamships engaged in foreign trade, 1,296,241 tons, or 14.8 per cent; leaving a decrease of 156,852 tons, or 0.4 per cent, in the total shipments of British coal abroad.

The British Admiralty has placed contracts for 60,000 tons best Welsh smokeless coal, to be delivered in November and December. The prices range from \$3.96 to \$4.10 per ton, f. o. b. Cardiff.

Messrs. Hull, Blyth & Co., of London & Cardiff, report under date of October 12, that prices of coal at Cardiff show a still further decline, dock room being very scarce. Quotations are: Best Welsh steam coal \$4.20 to \$4.44; seconds, \$3.96; thirds, \$3.60; dry coals, \$3.36; best Monmouthshire, \$3.48 to \$3.60; seconds, \$3.12 to \$3.24; best small steam coal, \$2.28; seconds, \$1.92; other sorts, \$1.56.

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 2.5 per cent discount.

Freights still continue in a very comatose condition all around, with little doing. Some rates from Cardiff are: Algiers, \$1.20; Marseilles, \$1.25; Genoa, \$1.26; Naples, \$1.32; Port Said, \$1.20; Singapore, \$3.60; Las Palmas, \$1.44; St. Vincent, \$1.62; Rio Janeiro, \$3.12; Santos, \$3.36; Buenos Aires, \$3.24.

Shanghai, China SEPT. 18.

(Special Report of Wheelock & Co.)

Coal.—Very little doing. Arrivals during the fortnight were 19,867 tons. We quote, per ton: Welsh-Cardiff, 19 taels (\$12.73); Australian Wollongong, 12.50 taels (\$8.38); Japan, Takasima, Namazuta, and Miike, all contracted for; but other sorts, 6 to 8 taels (\$4.02 to \$5.36); Chinese, Navy, \$16; locomotive, \$13; Household, \$12; No. 1, slack, \$10; No. 2, slack, \$7.75, and No. 3, slack, \$7.

Kerosene Oil.—Very large demand, especially for Devoes. Market advanced 3 or 4 points and a fair business has been done at the Tea Shops at 1.74 taels per case, while importers have parted at 1.77 1-2 taels, less 2 per cent. On the other hand the demand for bulk oil is very small and at lower prices. Batum is steady. Stocks are 226,500 cases American; 942,750 cases Russian, and 199,700 cases Dutch; total, 1,368,950 cases. We quote, per case, as follows: American Devoe's, 1.74 taels (\$1.16); Russian, Anchor Chop, 1.56 taels (\$1.04); Star & Crescent Chop, 1.51 taels (\$1.01); Horse Chop, 1.53 taels (\$1.02); and bulk oil, loose, 1.06 taels (\$1), and in 2 tins, 1.43 1-2 taels (96 c.); Dutch, Langkat, Dragon Chop, 1.50 taels (\$1.01); bulk oil, same as Russian.

CHEMICALS AND MINERALS

New York

Oct. 25.

Buying for immediate delivery is small, but for the future it is large in most lines. Two features are the great strength of brimstone, and the discouraging weakness of nitrate of soda. With few exceptions prices are unchanged.

Brimstone.—Very strong, as there is little on spot, and the market abroad is in better control by the syndicate. Importers quote spot best unimixed seconds at \$28 per ton, and shipments at \$23 @ \$23.50, and thirds, \$20.25 @ \$23, according to position.

Imports of brimstone into Great Britain in the 9 months ending September 30th were 17,657 long tons, as against 18,133 tons last year; a decrease of 476 tons, owing to a smaller consumption by the alkali trade.

Heavy Chemicals.—The usual season contract deliveries occupy much of the attention of the trade,

and only occasionally is an export order filled. Bleaching powder is easier. The domestic production is still small and of an off-test (about 30 per cent chlorine), of which sales are reported at \$1.40 to \$1.50 per 100 lbs. Further 1902-3 contracts for domestic high test caustic soda are noted at quotations below.

Prices per 100 lbs. are as below:

Articles.	Domestic.		Foreign.	
	F. o b Works.	In New York.	In New York.	In New York.
Alkali, 58%	77½ @ 82½			
Alkali, 48%	82½ @ 87½			
Caustic Soda, high test.	\$1.90 @ \$1.92½		\$2.25 @ \$2.50	
powd. 60%		2.75		
70% 74%		2.85 @ 3.00		
98%		3.25	3.75	@ 4.00
Sal. Soda.		.55		.67½
Sal. Soda conc.	1.25 @ 1.50			1.75
Bicarb. Soda.	.95 @ 1.00		1.37½ @ 1.75	
Bicarb. Soda, extra.	3.25 @ 3.50			
Bleach. Pdr.: Eng. prime.			1.90 @ 2.00	
Other brands.			1.75 @ 1.90	
Chl. Pot. cryst.	8.25 @ 8.37½		9.75 @ 10.00	
Chl. Pot. powd.	8.37½ @ 8.62½		10.25 @ 10.75	

Tin Crystals.—Cheaper raw material has reduced the price of tin crystals 20@20½c. per lb.

Acids.—Market shows an improved demand for most acids. Oxalic continues weak, and sales over next year are noted at \$4.87-1-2 to \$5 per 100 lbs. Blue vitriol is firm.

Exports of copper sulphate from Great Britain in the 9 months ending September 30 were 34,664 tons, against 38,994 tons last year, a decrease of 4,330 tons, owing to the smaller buying by the vineyards in the Mediterranean countries.

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:

Acetic	\$1.80	Nitric, 42%	\$4.37½
Blue Vitriol	4.62½ @ 4.75	Oxalic	5.25 @ 5.50
Muriatic 18%	1.25	Sulphuric, 60% bulk,	12.00 @ 14.00
Muriatic, 20%	1.37½	Sulphuric, 60%	1.50
Muriatic, 22%	1.50	Sulp., bulk, ton	16.00 @ 18.00
Nitric, 36%	3.62½	Sulphuric, 66%	1.10
Nitric, 38%	3.87½	Sulp., bulk, ton	19.00 @ 21.00
Nitric, 40%	4.12½		

Pyrites.—Sulphuric acid makers are ordering freely, and prices continue firm.

We quote, per ton, as follows: Mineral City, Va., lump ore, \$4.90 per long ton, and fines, 10c. per unit; Charlemont, Mass., lump, \$5, and fines, \$4.75. Spanish pyrites, 12@14c. per unit delivered ex-ship New York and other Atlantic ports. Spanish pyrites contain from 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Imports of pyrites into Great Britain in the 9 months ending September 30, amounted to 46,363 tons, as against 65,201 tons in the corresponding period last year; a decrease of 18,838 tons, or 29 per cent.

Sulphate of Ammonia.—Quiet at \$2.77 1-2 @ \$2.80 per 100 lbs. for gas liquor.

Nitrate of Soda.—Wrecker. Spot is quoted at \$1.89 per 100 lbs., while futures are nominal at \$1.92 1-2. During the next three months arrivals are expected to be large and in excess of consumptive demand, assuring low prices for some time to come. On the coast the market is quiet but firm. Ocean freights have declined noticeably, and as low as 21s. 3d. is reported, as compared with about 36s. last year, showing a fall of 15s. Some producers have placed freight contracts over the first quarter of next year around 25s.

Concerning the Chilean nitrate of soda market, Messrs. Jackson Brothers, of Valparaiso, write us under date of September 7 that the great scarcity of disposable nitrate for this year's delivery sustains the market, and exporters have been obliged to pay higher prices. Transactions have been effected at 6s. 7½d. @ 6s. 8d. alongside for October-December, 6s. 7d. for January, 6s. 6d. for January-March, and at 6s. 4d. for April-December deliveries. Due to the national holidays transactions have been limited, and only amount to about 600,000 quintals. The production of nitrate up to August 31 of this year amounted to 18,644,000 quintals, against 21,037,500 quintals during the same period of 1900; the consumption of the world being 16,427,000 quintals and 15,849,000 quintals respectively. We quote 95 per cent, October-December, 6s. 8½d., and January-March, 6s. 6½d.; and 96 per cent, October-December 6s. 9½d., all ordinary terms, sellers. The price of 6s. 8½d., with an all round freight of 27s. 6d., stands in 8s. 10d. per cwt. net cost, and freight without purchasing commission.

Phosphates.—Fewer orders from abroad are reported. An authority estimates the stocks of high grade rock in Florida at 146,000 tons, which is a much larger quantity than has been carried for years. Pebble phosphates are cheaper. Tennessee and South Carolina rock are unchanged.

Imports of phosphates into Great Britain in the 9 months ending September 30th were 266,619 long tons, against 274,399 tons last year; a decrease of 7,780 tons. Of this year's imports about 10 per cent was Florida high grade rock.

We quote prices as below:

Phosphates.	Per ton F. o. b.	C. i. f. Un'd Kingdom or European Ports.	
		Unit.	Long ton.
* Fla. hard rock (77@80%).	\$6.50@7.00	6½ @ 7½d	\$10.53 @ 10.92
* Fla. land pb. (68@73%).	3.00 @ 3.25	5 @ 6d	7.00 @ 8.40
* Fla. Peace Riv. (58@63%).	2.25 @ 2.50	5 @ 5½d	6.00 @ 6.60
† Tenn. 78@80%, export.	3.25	6½ @ 7d	10.53 @ 10.92
† Tenn. 75% domestic.	2.75 @ 3.00		
† Tenn. 70% domestic.	2.10 @ 2.25		
† So. Car. land rock.	3.50	5 @ 5½d	6.00 @ 6.60
† So. Car. river rock.	2.75 @ 3.25		
Algerian, rock (63@70%).		6 @ 6½d	8.04 @ 8.70
Algerian, rock (58@63%).		5 @ 5½d	6.00 @ 6.60
Tunis, Gafsa (58@63%).		5 @ 5½d	6.00 @ 6.30
* Ferdinandia. † Mt. Pleasant.			† On vessels Ashley River.

Freight rates from Florida ports are about as follows: To Baltic ports, \$5; Continental, \$3.24 @ \$3.60; Mediterranean, \$4.20 @ \$4.56; United Kingdom, \$3.84. From Savannah, Ga., to Continental ports, \$3.18.

Liverpool

Oct. 15.

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

There is no special activity in heavy chemicals, but, at the same time, there is a fair, steady, business passing in most lines. Soda ash is well maintained and makers are well employed with orders. Nearest spot range for tierces may be called about as follows: Leblanc ash, 48 per cent, £5 15s. 6d. @ £6; 58 per cent, £6 2s. 6d. @ £6 7s. 6d. per ton, net cash; Ammonia ash, 48 per cent, £4 10s. @ £4 15s.; 58 per cent, £4 15s. @ £5 per ton, net cash; Bags, 5s. per ton under price for tierces. Soda crystals find a ready outlet and for most quarters the price is steady at £3 7s. 6d. per ton, less 5 per cent for barrels or 7s. less for bags; with special terms for certain export markets. Caustic soda is in fair request and quotations are unchanged, as follows: 60 per cent, £9 @ £9 5s.; 70 per cent, £10 @ £10 5s.; 74 per cent, £10 10s.; 76 per cent, £10 15s. @ £11 per ton, net cash. Bleaching powder is firmly held at £7 @ £7 5s. per ton, net cash for hardwood packages; with special terms for Continental markets. Chlorate of potash is in moderate demand at 3@31-8d. per lb., net cash. Bicarbonate soda is selling at £6 15s. per ton, less 2 1-2 per cent for the finest quality in 1 cwt. kegs, with usual allowances for larger packages, also special terms for a few favored markets. Sulphate of ammonia continues quiet, but without alteration in quotations which remain at £11 @ £11 2s. 6d. per ton, less 2 1-2 per cent, for good gray 24@25 per cent in double bags f. o. b. here. Nitrate of soda is selling to a moderate extent on spot at £9 10s. @ £9 12s. 6d. per ton, less 2 1-2 per cent for double bags f. o. b. here, as to quality and quantity.

SLATE TRADE REVIEW.

New York.

Oct. 15.

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

Size, Inches	Monson or Br'nville.	Bangor.	Bangor Ribbon.	Alb'n or Jackson Bangor.	Chap'n Keystone.	Peach Bottom.	Sea Gr'n.	Unfed g Green.	Red.
24 x 14	6.50	3.50	3.00	3.00	5.10	3.00	3.00	3.00	
24 x 12	6.60	3.50	3.00	3.00	3.80	5.25	3.00	3.75	
22 x 12	6.60	3.50	3.25	3.00	4.00	5.25	3.00	3.75	
22 x 11	6.50	3.75	3.25	3.00	4.00	5.25	3.00	4.00	
20 x 12	6.90	3.75	3.00	3.00	5.25	3.00	3.75		
20 x 11	6.80	3.75	3.25	3.00	5.25	3.00			10.50
20 x 10	6.80	4.25	3.50	3.25	4.00	5.35	3.00	4.25	
18 x 12	6.80	3.75	3.00	3.00	5.25	3.00	3.50		
18 x 11	7.00	3.75	3.00	3.00	5.25	3.00	3.75		
18 x 10	7.00	4.25	3.50	3.25	4.00	5.35	3.00	4.00	10.50
18 x 9	7.00	4.50	3.50	3.25	4.00	5.35	3.00	4.25	10.50
16 x 12	6.80	3.75	3.00	3.00	5.25	3.00	3.50		
16 x 10	7.00	4.00	3.50	3.25	4.00	5.25	2.90	4.00	10.50
16 x 9	7.00	4.25	3.25	3.00	5.35	2.90	4.25	10.50	
16 x 8	7.00	4.50	3.50	3.25	4.25	5.35	2.90	4.25	10.50
14 x 10	6.60	3.75	3.25	3.00	5.25	2.70	3.75	10.50	
14 x 9	6.50	3.75	3.00	3.00	5.25	2.70	3.75	10.50	
14 x 8	6.60	3.75	3.25	3.00	4.00	5.10	2.70	4.25	10.50
14 x 7	6.40	3.75	3.25	3.00	3.75	5.10	2.50	4.25	10.50
12 x 10	5.75	3.75	3.00	3.00	5.25	2.50	3.25		
12 x 9	5.90	3.75	3.00	3.00	5.25	2.50	3.25		
12 x 8	5.50	3.50	3.00	2.85	4.85	2.50	3.50	9.00	
12 x 7	5.00	3.25	2.85	2.85	3.25	4.85	4.00	3.50	9.00
12 x 6	4.80	3.25	2.85	2.85	3.25	4.75	2.00	3.50	8.50

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

Roofing slate dealers report a better demand, but the stock of desirable sizes in the hands of quarrymen have delayed many shipments. Prices continue good. Manufactured slate moves in moderate lots at satisfactory prices. Export trade is quiet.

IRON MARKET REVIEW

NEW YORK, Oct. 25, 1901.

Pig Iron Production and Furnaces in Blast

Fuel used	Week ending		From Jan., '00.	From Jan., '00.
	Oct. 26, 1900.	Oct. 25, 1901.		
Anthracite and F'ces.	Tons.	Tons.	Tons.	Tons.
Coke	182	215,550	221	300,675
Charcoal	31	8,325	25	7,475
Totals	213	223,875	246	308,150
			11,750,068	12,785,319

Business in all lines of the iron and steel trade continues very large. Our local reports show the placing of large orders for forge and foundry irons, as well as bessemer and basic pig, with some increases in quotations. Southern foundry and basic irons are in demand. It is evident that large consumers have made up their minds to secure supplies for the next year, for many of the contracts lately placed run over the first half of 1902. Small buyers who need iron for immediate use, are having a hard time of it.

In steel billets the situation is much the same. Small buyers cannot get short deliveries, and mills which depend on purchased billets find hardly any in sight before the second quarter of next year.

In finished material demand continues very large. Structural steel, plates and bars are all in demand and very few mills can promise early deliveries. The rail mills are almost full for next year. In rails the placing of the Pennsylvania Railroad order for 170,000 tons is the event of the week; while some other large orders are reported to be pending.

With such strong home demand little is heard of export trade, and few foreign orders are now being placed. The mills are not disposed to make any concessions to secure them.

Birmingham, Ala

Oct. 21.

(From Our Special Correspondent.)

The pig iron and steel markets in this State are strong. There are indications that the furnace men will shortly be demanding another advance of 50c. per ton on pig iron. Several good orders were placed during the past week and orders for delivery during the first three months of the coming year are being given in this district.

The production in Alabama has been increased by the blowing in of a furnace by the Sloss-Sheffield Steel and Iron Company during the past week. This was the City Furnace which recently was put through a thorough repair. The same company will have North Birmingham Furnace ready for the torch within the next four weeks. Trussville Furnace, which was recently leased by C. E. Buck, will probably be put in operation within the next two weeks.

The report of the Southern Iron Committee for the month of September showed that Alabama and Tennessee shipped out 123,522 tons of pig iron and 13,703 tons of cast iron pipe. The Birmingham District alone shipped 58,209 tons of pig iron and 6,683 tons of cast iron pipe. With the exception of the pipe there is a slight difference as compared to the shipments during the month of August, but there is a good increase over shipments made in September, 1900. In addition, 3,583 tons of steel were shipped from this State during September.

Pig iron shipments by districts were as follows: Anniston, 16,377 tons; Birmingham, 58,209 tons; Nashville, 8,271 tons; Sheffield, 19,182 tons; Middleboro, 4,210 tons; Chattanooga, 17,273 tons; total, 123,522 tons. Cast iron pipe by districts: Anniston, 4,259 tons; Birmingham, 6,683 tons; Chattanooga, 2,761 tons; total, 13,703 tons. Total shipments of pig iron from Tennessee and Alabama during 9 months of the year were 1,108,926 tons; cast iron pipe, 124,122 tons; steel, 42,415 tons.

The following quotations are given in this district: No. 1 foundry, \$11.50 @ \$12; No. 2 foundry, \$11; No. 3 foundry, \$10.50; No. 4 foundry, \$9.75; gray forge, \$9.50 @ \$9.75; No. 1 soft, \$11.50 @ \$12; No. 2 soft, \$11.

The demand for finished iron and steel continues good and a number of special orders are being worked on in the rolling mills. The demand for steel is large, and the steel plant of the Tennessee Coal, Iron and Railroad Company at Ensley has been operating some of its departments with a night shift. The plant of the Alabama Steel and Wire Company is doing considerable work, all departments except the rod mill having a night shift. The owners of this plant are making preparations looking to the addition of a large amount of machinery.

Buffalo

Oct. 23.

(Special Report of Rogers, Brown & Company.)

There is no let-up in the demands upon furnaces tributary to this territory for shipments on existing contracts and a shortage of cars added to the shortage of iron keeps furnaces busy in an endeavor to satisfy their customers' wants. Prices for immediate deliveries are absolutely in the hands of sellers, buyers in need of prompt shipment iron being so numerous that the question of price is a secondary matter, the main question being ability to furnish. There is considerable difference in the views of buyers in regard to placing orders for future delivery. Some are anxious to get their contracts closed, others are firmly holding back with an idea that prices will be lower before being higher, and still others are undecided and hesitating. Business in general is very satisfactory and a review of the week's trade shows a number of heavy sales. We quote below on the cash basis, f. o. b. cars, Buffalo:—No. 1 strong foundry coke iron, Lake Superior ore, \$15.50; No. 2, \$15; Southern soft No. 1, \$15.75; No. 2, \$15.25; Lake Superior charcoal, \$18.25; coke, malleable, \$15.50.

Cleveland Oct. 23.

(From Our Special Correspondent.)

**Iron Ore.**—The lake vesselmen were able to break a combination of shippers here to-day, and as a result a contract for the movement of 300,000 tons of ore has been placed on the basis of \$1 from Duluth to Ohio ports. This is an advance of 10c. on the ton. The Escanaba rate has also been advanced during the week to 70c. to Ohio ports. These are the first movements of wild ore for the last week or 10 days due to that peculiar condition of affairs which has been brought about by the car shortage, where shippers and vesselmen alike were pushing contract tonnage to the fore. The Marquette rate has remained unchanged, due practically to the absence of any active business. There is not much talk now of ore sales, and the quotations are nominal at \$4.25 for bessemer and \$3 for non-bessemer and Mesabi.

**Pig Iron.**—Further contracting for pig iron has been done during the last week, and some of the contracts entail deliveries for the first half of next year. The selling for spot delivery has been so heavy that it is almost impossible now to get material before the first of the year. The market is now strong, on a quotation of \$14 for No. 2 in the Valley. Southern foundry is selling quite heavily now, and the quotation remains firm at \$11 at Birmingham. The expected advance has not been charged up so far. Bessemer and basic are selling well for immediate delivery, although there is an absence of business for the period following January 1. The possible supply for the month of December has been pretty generally disposed of. The prices do not change in the least, holding firm at \$15.25 in the Valley for bessemer and \$14.25 at furnace for basic.

**Finished Material.**—The sales of rails keep up well for next year's deliveries, and there is still a good bit of business in sight. The price does not change, as all of the contracts taken are on the basis of \$28. Billets are at a premium and are hard to obtain, especially those of bessemer quality. In many instances open-hearth billets are sold in the place of bessemer grades, even though at higher prices, because the bessemer billets are not to be had. The demand for structural material keeps up well, and the selling has been heavy enough to insure a continuance of the present activity in the market until after the winter season has passed. As this will tide the mills over the dull season all are satisfied. The prices hold firm at 1.70c. on beams, channels and angles, with some of the smaller sizes almost off the market. Small-sized plates are also off the market, but the larger sizes are not much in demand. The mills engaging in rolling the plates of heavier grade are in fact looking for business right sharply, and the market is inclined to be a little weak. The price holds at 1.70c. Sales of sheets are still very satisfactory, and the mills are reporting orders in excess of their ability to make prompt delivery. The prices remain stable. Bar mills are noting some relief from the stress which has prevailed. This is due to the opening of certain mills and the rapid work done by others. The prices are now easier, with deliveries possibly in shorter time than since the opening of the big strike. Iron bars are quoted at 1.55c., Pittsburg; bessemer steel bars at 1.50c., Pittsburg, and open-hearth steel bars at 1.60c., Pittsburg.

**Old Material.**—Prices have eased up some, but nominally hold at the old quotations. The quotations therefore are as follows: Heavy steel, \$17; steel rails, \$17; old iron rails, \$22; old car wheels, \$14; old steel axles, \$19; stove plate, \$10; cast scrap, \$13; No. 1 wrought, \$16.50; cast borings, \$8.

Philadelphia Oct. 23.

(From Our Special Correspondent.)

**Pig Iron.**—The agitations in Western Pennsylvania and the movements of so many western pig iron users to secure Alabama iron, have had a stimulating effect on local consumption. Since Monday quite a lot of pig has been contracted for, and mostly by the smaller consumers throughout our territory. The larger consumers seem to be pretty well fixed and are less concerned. But even in this class there are a few who are asking for 1902 deliveries, evidently alarmed at the unexpected strength of pig iron. The mill people have in several instances had understandings with furnace men regarding iron. The only disappointment encountered by some buyers is that the special brands are out of the market indefinitely. The greatest activity has been in basic iron at \$14. Bessemer is very strong at \$14.50@15; No. 1 foundry is \$14.50@16; No. 2 foundry, \$15@15.50; No. 2 steam, \$14.50; standard ledge, \$14; ordinary, \$13.50.

**Billets.**—Buyers believe the market is entering upon conditions which will radically reduce prices. The only local authorities here do not admit that there is not so much to be expected in this expected increase in supply; in other words, they believe billets will not drop much. They point to the high position of bessemer at Pittsburg. Business has been done as low as \$25.50, but urgent requirements cannot be filled at any such

price. The situation may be clear to makers, but it is not understood here in view of very recent transactions at the mills which rumor states involved sales of January billets at a material drop.

**Bars.**—All bar iron and steel makers who could be seen or reached this week give information that agrees on one point, viz., that prices are strong one reason is that the car building demand is again felt. But the rush of orders from small buyers is phenomenal and they want the iron at once. Refined sold up to 1.70c. this week and even to 1.75c. The pressure on bar mills seems to be increasing.

**Nails.**—Our nail people say business is excellent and that the drop in wire has not made any difference.

**Skelp.**—The strain for skelp does not seem to fall off; our mills are under contract for enough skelp to enable them to run for weeks to come. Prices are strong and while production in the West is larger our people think there will be openings enough for all that will be made up to the close of the year.

Pittsburg Oct. 23.

(From Our Special Correspondent.)

The heavy purchases of bessemer and other grades of pig iron during the past few weeks have not only created a scarcity for delivery this and next month, but have resulted in an advance in prices. While no sales of bessemer iron were made at an increase, a better price than \$15.25. Valley furnaces, was offered for spot shipment, but it was not possible to obtain deliveries. Gray forge and foundry iron prices have advanced from 25 to 75 cents a ton, and several thousand tons were sold at the increase. Bessemer and open-hearth billets are still scarce, and no sales have been made. All of the iron and steel mills in this district have sufficient business on their books to keep them in continuous operation until the end of the year. Some orders will not be filled until the new year. The leading steel interest outside of the big corporation has orders that will run into the first quarter, and it will begin the year 1902 with a more prosperous outlook than for many years past. The consumption of structural material is remarkable, and many large buildings have been delayed on account of the inability of the mills to promptly fill all orders. A large amount of business taken for this year will not be delivered before January or February. Despite the continued heavy demand for finished iron and steel products, there has been no change in prices, which remain firm and are likely to be continued into the first and second quarter of the coming year. Many inquiries are being received for steel for next year's delivery, but the leading concerns are not quoting prices on some lines that promise to be scarce. The plate market is unchanged, and while a satisfactory amount of new business has been taken during the week manufacturers are able to make deliveries on plates more promptly than on any other line. The agreement on prices among the manufacturers which recently expired has been renewed for another year. W. C. Temple, of this city, has been made commissioner of the pool, as it is called. He is also commissioner of the beam pool, which regulates the prices of structural material. Sheets continue scarce, and prices are still high. The American Sheet Steel Company does not appear to be catching up very rapidly on the business that was tied up by the steel workers' strike. All the mills are crowded with orders that will require several months to fill. So far as can be learned at present the demand for steel rails for delivery next year will exceed the capacity of the mills of the country. It is generally believed that prices will soon be advanced to at least \$30. Orders to date, it is estimated, aggregate about 1,200,000 tons taken at \$28, in addition to about 350,000 tons that will be carried over. This is more than one-half of the capacity of the mills. The starting of the rail mill of the National Steel Company at Youngstown several weeks ago adds about 1,500 tons a day to the production, and probably 400,000 tons will be turned out at this plant next year. The Pennsylvania Railroad Company, it is reported, has placed contracts for 170,000 tons, of which 70,000 tons will be made by the Pennsylvania and Cambria steel companies.

**Pig Iron.**—Sales of bessemer pig iron during the week are said to have exceeded 30,000 tons for delivery during the last quarter at \$15.25, Valley furnaces. Gray forge is scarce this week, and the price is higher; several thousand tons were sold at \$14.25, Pittsburg. Foundry No. 2 is in good demand, and is quoted at \$15@15.25, Pittsburg. Probably 4,000 tons were sold.

**Steel.**—Bessemer and open-hearth steel billets continue scarce. The former are quoted at \$28 for this year's delivery, but no sales were made. A number of inquiries have been received for billets for next year that remain unanswered. The leading steel interest is said to have accepted some orders for billets for 1902 at \$27. Business in bars and plates is satisfactory, and prices are unchanged.

**Sheets.**—There is but little change in the sheet steel situation. The combination is still behind in deliv-

eries, and is not accepting any business for immediate shipment. Prices are unchanged, 4c. being quoted for spot and 3.25@3.35c. for future delivery for No. 28 gauge. Galvanized sheets are still quoted at 70 and 10 per cent off, and for immediate shipment 65 and 5 per cent off is asked.

**Ferro-Manganese.**—Domestic 80 per cent is quoted this week at \$55, and a few sales were made.

New York Oct. 25

**Pig Iron.**—Demand is strong, and an increasing number of consumers are placing orders for the first half of next year. We quote for tidewater delivery: No. 1X foundry, \$15.50@15.65; No. 2X, \$14.65@15.15; No. 2 plain, \$14.15@14.65; gray forge, \$14@14.50. For Southern iron on dock, New York, No. 1 foundry, \$15.50@15.75; No. 2, \$14.75@15; No. 3, \$14.25@14.50; No. 4, \$13.75@14; No. 1 soft, \$15.50@15.75; No. 2, \$14.50@14.75.

**Bar Iron and Steel.**—Buying continues active at full prices. We quote 1.53c. for common bars in large lots on dock; refined bars, 1.63c.; soft steel bars, 1.65c.

**Plates.**—Demand continues steady and strong, with prices the same. We quote for tidewater delivery in carloads: Tank, 1/4-in. and heavier, 1.78c.; flange, 1.88c.; marine, 1.98c.; universals, 1.78c.

**Steel Rails and Rail Fastenings.**—A number of Eastern railroad systems have placed orders for next year, and others will soon place orders. There is no report of any change in prices. Standard sections are quoted at \$28 at Eastern mills; light rails at \$28@30, according to weight. Spikes are 1.80c.; splice bars, 1.55c.; bolts, 2.60@2.70c.

**Structural Material.**—Consumption continues active, with no change in prices. We quote for large lots at tidewater as follows: Beams, 1.75c.; channels, 1.75c.; tees, 1.80c.; angles, 1.75c.

METAL MARKET.

New York Oct. 25.

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At All United States Ports in September and Year.

Metal	September		Year	
	1900.	1901.	1900.	1901.
Gold Exports..	\$806,572	\$162,912	\$52,604,921	\$35,136,681
Imports..	7,861,553	11,642,070	39,989,110	35,186,681
Excess ..	1,705,481	1,111,479	12,615,811	2,456,562
Silver Exports..	5,723,708	4,835,153	47,501,891	41,488,370
Imports..	4,171,935	2,469,820	30,270,430	22,765,737
Excess ..	1,551,773	2,365,333	17,231,461	18,722,634

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 Oct. 24th, 1901, and for years from January 1st, 1901, 1860, 1899, and 1898.

Period.	Gold.		Silver.		Total excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week .....	\$ 40,760	\$ 401,845	\$ 95,146	\$ 265,939	E. \$ 265,939
1901 ..	\$26,108,329	4,055,363	25,524,190	3,146,985	E. 44,430,281
1900 ..	36,631,703	4,839,872	32,440,473	3,930,651	E. 60,301,153
1899 ..	11,648,120	13,129,057	23,683,040	3,038,220	E. 10,161,889
1898 ..	7,274,687	91,301,209	28,019,569	2,493,117	E. 1,615,000,170

There were no exports of gold during the week; imports were in small lots, from various sources. Exports of silver were chiefly to London; imports were from Mexico and Central America.

FINANCIAL NOTES OF THE WEEK.

Business continues good and general trade is losing none of its activity. A sharp rise in exchange is noted, which is generally understood to result from an insufficient supply of commercial bills to meet the demand for remittances to London. The situation in Paris and Berlin is not good, and both cities have been drawing heavily on London and New York. It is stated that some large loans made abroad have to be settled in the next two weeks, and some shipments of gold may be necessary.

Notwithstanding the demand for silver the price seems to be a declining one; and apparently it requires a conjunction of orders from the East as well as a Continental demand to give buoyancy to the market.

The statement of the United States Treasury on Wednesday, October 23, shows balances in excess of outstanding certificates as below, compared with the corresponding day last week:

	Oct. 16.	Oct. 23.	Changes.
Gold .....	\$100,995,136	\$101,935,485	I. \$940,349
Silver .....	18,084,918	15,357,472	D. 2,727,444
Legal tenders .....	7,634,875	7,573,400	D. 61,475
Treas. notes, etc.....	57,364	53,422	D. 3,942
Totals .....	\$126,772,291	\$124,919,779	D. \$1,852,512

Treasury deposits with national banks amounted to \$110,583,692, showing a decrease of \$168,410 over last week.

The statement of the New York banks, including the 63 banks represented in the Clearing House—for the week ending October 19—gives the following totals, comparison being made with the corresponding week in 1900 and 1901:

	1899.	1900.	1901.
Loans and discounts.....	\$700,543,900	\$797,849,200	\$874,939,200
Deposits .....	768,375,700	846,432,800	945,114,100
Circulation .....	15,727,400	30,431,300	31,376,700
Specie .....	143,674,300	156,654,200	181,941,900
Legal tenders .....	49,890,700	57,901,700	69,802,400
<b>Total reserve.....</b>	<b>\$193,535,000</b>	<b>\$214,555,000</b>	<b>\$261,744,300</b>
Legal requirements.....	192,093,925	211,608,200	236,278,525
Balance, surplus....	\$1,441,075	\$2,947,700	\$15,465,775

Changes for the week, this year, were increases of \$4,038,500 in loans and discounts, \$2,425,200 in deposits, and \$392,900 in circulation, decrease of \$560,000 in specie, \$851,100 in legal tenders, and \$2,071,400 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.

Banks:	1900.		1901.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'n.....	\$156,654,200	.....	\$181,941,900	.....
England .....	187,367,455	.....	185,885,645	.....
France .....	456,404,680	\$223,332,585	470,404,430	\$219,052,385
Germany .....	124,465,000	64,115,000	132,310,000	68,180,000
Spain .....	68,445,000	83,345,000	70,025,000	74,475,000
Neth'lds .....	24,350,000	27,500,000	28,776,500	28,484,500
Belgium .....	13,805,000	6,905,000	15,203,335	7,601,665
Italy .....	77,060,000	8,370,000	79,725,000	9,842,500
Russia .....	356,150,000	32,060,000	331,910,000	29,580,000

The returns of the Associated Banks of New York are of date October 19, and the others October 17, as reported by the "Commercial and Financial Chronicle" cable. The New York banks do not report silver separately, but the specie carried is chiefly gold. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to October 10, 1901, are reported by Messrs. Pixley & Abell's circular as follows:

	1900.	1901.	Changes.
India .....	£4,726,272	£6,172,910	I. £1,446,638
China .....	971,352	590,212	D. 381,140
The Straits .....	496,794	296,034	D. 200,760
<b>Totals.....</b>	<b>£6,194,430</b>	<b>£7,059,156</b>	<b>I. £864,726</b>

Arrivals for the week, this year, were £188,000 in bar silver from New York, £30,000 from the West Indies, £9,000 from Chile, and £2,000 from Australia; total, £229,000. Also £63,000 in Mexican dollars from Vera Cruz, and £30,000 from New York; total, £93,000. Shipments were £210,000 in bar silver to Bombay, £22,677 to Hongkong, and £8,361 to Penang; total, £241,638.

Indian Exchange has been fairly steady and the Council bills offered in London were taken at an average of 15.97d. per rupee. Demand for bills is not so heavy, but is still good.

Imports of specie at San Francisco for the nine months ending September 30 are reported as follows:

	Gold.	Silver.	Totals.
Coin .....	\$8,469,072	\$362,485	\$8,831,557
Bullion .....	3,327,030	1,898,295	5,225,325
<b>Totals.....</b>	<b>\$11,796,102</b>	<b>\$2,260,780</b>	<b>\$14,056,882</b>
Totals, 1900 .....	13,411,119	2,141,940	15,553,059

The imports this year were from the following countries: British Columbia, \$106,030; Mexico, \$2,721,447; Central America, \$83,450; South America, \$114,797; Australia, \$8,294,253; Japan, \$2,677,813; China, \$43,775; other countries, \$15,312.

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

	1900.	1901.
Imports .....	£379,187,642	£384,460,711
Exports .....	266,514,753	259,902,939
Excess, imports .....	£112,672,889	£124,557,772

The increase in imports was £5,273,069, or 1.3 per cent; the decrease in exports was £6,611,814, or 2.5 per cent, leaving an increase of £11,884,883, or 10.5 per cent, in the excess of imports. The gold and silver movement for the nine months was as follows:

Gold:	Imports.		Exports.		Excess.
	1901.	1900.	1901.	1900.	
1901.....	£17,306,608	£7,350,289	Imp.	Exp.	£9,956,319
1900.....	20,948,483	10,685,853	Imp.	Exp.	10,262,630
<b>Silver:</b>					
1901.....	8,760,707	8,831,086	Exp.		70,359
1900.....	9,424,698	9,614,875	Exp.		190,177

Of the silver imported this year a total value of £7,434,124, or 84.8 per cent of the total, is credited to the United States.

OTHER METALS.  
Daily Prices of Metals in New York.

October	Silver—			Copper—			Spelter—			
	Sterling Exchange	Fine oz. Cls.	London Pence.	Lake Cts. per lb.	Electrolytic per lb.	London £ per ton.	Tin, cts. per lb.	Lead cts.	N-Y. cts.	St. L. cts.
19	4.85%	57%	26%	@16	16 1/2	25 1/2	@4.37 1/2	@4.27 1/2	@4.12 1/2	4.10
21	4.85%	57%	26	@16	16 1/2	64 1/2	@4.37 1/2	@4.27 1/2	@4.12 1/2	4.10
22	4.86%	57%	26 1/2	@16	16 1/2	62 1/2	@4.37 1/2	@4.27 1/2	@4.12 1/2	4.10
23	4.86%	57%	26 1/2	@16 1/2	16 1/2	63 1/2	@4.37 1/2	@4.27 1/2	@4.12 1/2	4.10
24	4.86%	57 1/4	26	@16 1/2	16 1/2	64 1/2	@4.37 1/2	@4.27 1/2	@4.12 1/2	4.10

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.

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 is without any new feature. Confidence, which was already apparent a week ago, has since made further progress. The scare which had come into the market a few weeks ago has given way to a belief that the prices which we have seen for a considerable time past, will be maintained. This, in turn, has resulted in greater activity, quite a large business having been consummated for early, as well as future, delivery. We quote Lake copper at 16 1/2 @ 16 1/4; electrolytic in cakes, wirebars and ingots at 16 1/4, in cathodes at 16c.; casting copper at 15 1/2 c.

The market for standard copper in London, which closed last week at £63 15s., opened on Monday at £64 10s., but broke sharply on Tuesday to £62 10s. Since then, however, matters have improved quite considerably, the closing price to-day being: £64 7s. 6d. @ £64 10s. for spot, and £62 15s. @ £62 17s. 6d. for 3 months.

Refined and manufactured sorts we quote: English tough, £71 5s. @ £71 15s.; Best selected, £72 5s. @ £72 15s.; Strong sheets, £80 @ £80 5s.; India sheets, £77 10s. @ £77 15s.; Yellow metal, 6 1-4 @ 6 3-8d.

Exports of copper from New York during the current week were: To Holland, 390 tons; Germany, 162; England, 375; Austria, 235; France, 150; Italy, 50; total, 1,352 tons. Also 290 tons matte to England.

Imports were 390 tons copper from Mexico, and 30 tons from England; total, 420 tons. Also 2,433 tons ore from Tilt Cove.

Imports of copper into Great Britain for the 9 months ending September 30 are reported as below, the totals giving the approximate equivalents in fine copper. The figures are in long tons:

	1900.	1901.	Changes.
Copper ore .....	82,616	73,900	D. 8,716
Matte and precipitate.....	64,834	65,313	I. 479
Fine copper .....	55,411	50,304	D. 5,107
<b>Totals, fine copper.....</b>	<b>96,090</b>	<b>90,351</b>	<b>D. 5,739</b>

Of the totals this year, 767 tons ore, 13,497 tons matte, and 15,030 tons fine copper, were from the United States.

Tin has been dull and lifeless. Transactions are very small, buyers continuing to cover only their immediate wants. At the close spot tin is selling at 24 3/4 @ 24 1/2, December at 24 @ 24 1/4 c.

The foreign market has ruled within narrow limits. It opened on Monday at £114 5s., being an advance of about £1 over last week's close; declined to £113 5s., but became firmer towards the end of the week, and the closing quotations are cabled as £114 2s. 6d. @ £114 5s. for spot, and £7 10s. lower for 3 months.

Imports and exports of tin in Great Britain for the 9 months ending September 30 are reported as below, in long tons:

	1900.	1901.	Changes.
Straits .....	17,178	19,274	I. 2,096
Australia .....	2,080	2,197	I. 117
Other countries.....	3,831	4,631	I. 800
<b>Total imports.....</b>	<b>23,089</b>	<b>26,102</b>	<b>I. 3,013</b>
Exports .....	18,604	20,447	I. 1,783
Balance .....	4,425	5,655	I. 1,230

The exports given are of metallic tin only, and do not include the tin exported in the form of tin-plates.

Exports of tin from the Straits for the eight months ending August 31 are reported as below, in long tons:

	1900.	1901.	Changes.
U. S. .....	10,612	12,552	I. 1,940
Great Britain .....	15,670	16,614	I. 944
Other Europe .....	1,585	3,853	I. 2,268
China and India.....	1,060	1,856	I. 796
<b>Totals .....</b>	<b>30,927</b>	<b>34,875</b>	<b>I. 3,948</b>

The increase this year has been large, 12.4 per cent, and is shown in the shipments to all countries.

Lead is quiet and unchanged. We quote St. Louis 4.25c. @ 4.32 1-2c.; New York, 4.32 1-2c. @ 4.37 1-2c.

The foreign market is steadier, Spanish lead being quoted at £11 10s. @ £11 11s 3d., English lead 2s. 6d higher.

Imports of lead into Great Britain for the nine months ending September 30 are reported as below, in long tons:

	1900.	1901.	Changes.
United States.....	29,562	34,196	I. 4,634
Spain .....	64,967	71,254	I. 6,287
Australia .....	38,775	43,243	I. 4,468
Other countries.....	10,407	10,250	D. 157
<b>Totals .....</b>	<b>143,701</b>	<b>163,949</b>	<b>I. 20,248</b>

The lead credited to the United States is chiefly Mexican lead refined here in bond. Exports of lead for the 9 months were 28,482 tons, against 28,607 tons last year.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Pig lead presents no novelty. Missouri lead is a shade easier, selling as low as 4.25c.; chemical lead is 4.27 1/2 c. asked, and 4.25c. bid. Desilverized metal is unchanged at 4.32 1/2 c.

Spelter again displayed considerable strength. Careful inquiries reveal the fact that the stocks in first hands are comparatively small, while the demand for both galvanizing and brass purposes, seems to be better than it has been for a long time past. The ruling quotations are 4.10 @ 4.12 1-2, St. Louis; 4.25 @ 4.27 1-2, New York.

The foreign market is also firmer, good ordinaries being quoted at £17, specials 5d. higher.

Imports of spelter or metallic zinc into Great Britain for the nine months ending September 30 were 50,031 long tons. For the corresponding period in 1900 the total was 53,732 tons; showing a decrease of 3,701 tons, or 6.9 per cent this year.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is strong and advancing; the latest sales are on basis of 4.10c., East St. Louis.

Antimony has been in fair demand. We quote Cookson's at 10c.; Hallett's, 8 3-8c.; Hungarian, Italian, Japanese, and U. S. Star at 8 1/4 c.

Nickel.—The price continues firm at 50 @ 60c. per lb. according to size and terms of order.

Platinum.—Consumption continues good and prices are strong. Ingot platinum in large lots brings \$20 @ \$21 per ounce in New York. In London prices are about on a parity with the New York rate.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 82c. per gram.

Quicksilver.—The nominal quotation in New York continues \$51 per flask, but the metal can still be had for somewhat less, \$49.50 for large orders. In San Francisco the quotations are \$47 @ \$48 per flask for domestic trade, and \$43 @ \$44 for export. The London quotation is £9 per flask, with the same price quoted from second hands.

Quicksilver receipts at San Francisco in September were 1,679 flasks; for the nine months ending September 30 they were 15,184 flasks, against 15,257 in the corresponding period of 1900. These receipts do not represent the California production, as they do not include shipments from mines direct to consumers. Shipments from San Francisco by water for the nine months were: New York, 50 flasks; British Columbia, 32; Mexico, 2,886; Central America, 808; Japan, 24; Korea, 12; Siberia, 2; total, 3,814 flasks, against 5,698 for the corresponding period last year.

Imports of quicksilver into Great Britain for the nine months ending September 30 were 2,573,595 lbs., against 402,278 lbs. for the corresponding period of 1900. Exports were 1,557,965 lbs., against 1,236,874 lbs. in 1900; showing an excess of imports of 1,015,630 lbs. this year, against an excess of exports of 834,596 lbs. last year.

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

	Per lb.	Per lb.	
Aluminum, No. 1, 99% ingots.....	33 @ 37c.	Ferro-Tungsten (37%)..... 28c.	
No. 2, 90% ingots.....	31 @ 34c.	Magnesium .....	\$2.75 @ \$3
Rolled sheets .....	42c. w.	Manganese (over 90%).....	\$1.00
Alum-brone .....	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 (over 90%).....	1.00	Phosphorus .....	50c.
Copper, red oxide.....	50c.	Copper, American .....	70c.
Ferro-Molyb'dum (50%).....	\$1.25	Sodium metal.....	50c.
Ferro-Titanium (10%).....	50c.	Tungsten (Best).....	62c.
Ferro-Titanium (20%).....	\$1.10		

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

LATE NEWS

BY TELEGRAPH.

(From Our Special Correspondent.)

Butte, Mont., October 23.—It is announced that Senator W. A. Clark will break ground within the next 30 days for a new copper smelter and refinery at some point in the State not fully decided upon.

Butte, Mont., October 24.—The breaking of the main driving shaft at the Lower works concentrator has caused a temporary shut-down of the Anacosta Hill Mines.

STOCK QUOTATIONS.

Prices of Foreign Coins.

Table with columns: Bid., Asked., Mexican dollars, Peruvian soles and Chilean pesos, Victoria sovereigns, Twenty francs, Twenty marks, Spanish 25 pesetas.

Average Prices of Metals per lb., New York.

Table with columns: Month, Copper, Tin, Lead, Spelter, 1901, 1900, 1901, 1900, 1901, 1900, 1901, 1900.

The prices given in the table for copper are the averages for electrolytic copper. The average price for Lake copper for the year 1900 was 16.52c.; for the month of January, 1901, it was 16.77c.; for February, 16.90c.; for March, 16.94c.; for April, 16.94c.; for May, 16.94c.; for June, 16.90c.; for July, 16.61c.; for August, 16.50c.; for September, 16.54c.

Average Prices of Silver, per oz., Troy.

Table with columns: Month, London, N. Y., 1901, 1900, 1899, Pence, Cents, Pence, Cents, Pence, Cents.

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

UNITED STATES.

Table with columns: Articles, Long tons, August, Eight months, Imports, Exports, Domestic.

The figures for copper are those given by the Treasury Department. The statement made by Mr. John Stanton for the Associated Copper Companies will be found monthly in our metal market. These figures give the exports for August as 6,840 tons; eight months, 61,691 tons.

Import Duties.

Metals.—The duties on metals under the present tariff law are as follows: Antimony, metal or regulus, 3c. a lb. Lead, 1 1/2c. a lb. on lead in ores; 2 1/2c. a lb. on pigs, bars, etc.; 2 1/2c. on sheet, pipe and manufactured forms. Nickel, 8c. a lb. Quicksilver, 7c. a lb. Spelter or zinc, 1 1/2c. a lb. on pigs and bars, 2c. on sheets, etc. Copper, tin and platinum are free of duty. Minerals.—Duties are: Asphalt, crude, \$1.50 per ton, and refined \$3 per ton. Coal, bituminous, 6c. long ton; coke, 20c. ad. val. Cement, Roman Portland and hydraulic, in bulk, 8c. per 100 lbs. and in packages 7c. Copper sulphate, 4c. a lb. Salt in bulk, 8c. per 100 lbs. and in bags, etc., 12c. Brimstone, antarcatic coal, graphite, phosphate rock, pyrites and nitrate of soda are free of duty.

NEW YORK

Table with columns: Company and Location, Par val., Oct. 18, Oct. 19, Oct. 21, Oct. 22, Oct. 23, Oct. 24, Sales.

Coal and Industrial Stocks

Table with columns: Am. Agr. Chem., Am. Agr. Chem pf., Am. Car & Fdy., Am. Car & Fdy. pf., Am. Sm. & Ref., Am. Sm. & Ref. pf., Col. & H. C. & I., Int'l S. Pump, Int'l S. Pump pf., Mong. R. Coal, Mong. R. Coal pf., National Lead, National Lead pf., National Salt, National Salt pf., Pittsburg Coal, Pittsburg Coal pf., Pressed Steel Car, Republic I. & S., Republic I. & S. pf., Sloss-Shef S. & I., Sloss-Shef S. & I. pf., Standard Oil, Tenn. C. I. & R. B., U. S. Steel Corp., U. S. Steel Corp. pf., Va.-Car. Chem., Va.-Car. Chem. pf.

Total sales, 554,635 shares.

BOSTON, MASS.

Table with columns: NAME OF COMPANY, Par. Val., Shares listed, Oct. 17, Oct. 18, Oct. 19, Oct. 21, Oct. 22, Oct. 23, Sales.

†Assessment Paid.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Acela, Alamo, Am. Con., etc., with columns for Par. val., Oct. 14, 15, 16, 17, 18, 19, and Sales.

Total sales 771,113 shares.

Colorado Springs by Telegraph.

Table of stock quotations for Colorado Springs by telegraph, listing companies like Acela, Alamo, Am. Con., etc., with columns for Par. val., Oct. 17, 18, 19, 21, 22, 23, and Sales.

PHILADELPHIA, PA.

Table of stock quotations for Philadelphia, Pa., listing companies like Am. Alkali, Am. Cement, Beth Iron, etc., with columns for Par. val., Oct. 17, 18, 19, 21, 22, 23, and Sales.

Total shares, 47,084 shares. Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia.

LONDON.

Oct. 12

Table of stock quotations for London, listing companies like Alaska Goldfields, Anaconda, Am. Con., etc., with columns for Name of Company, Country, Authorized Capital, Par. value, Last dividend, and Quotations.

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver. \*Ex-dividend.

MEXICO.

Oct. 12

Table of stock quotations for Mexico, listing companies like Durango, Guanajuato, Augustas, Pozos, etc., with columns for Name of Company, Shares, Last div'd, Bid, Ask, and Prices.

MONTREAL, CANADA.

Oct. 21.

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, Can. Gold Fields, etc., with columns for Name of Company, Par. val., H., L., Sales, and Prices.

