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Mr. J. WINCHESTER HOLMAN, who formerly represented *Mining and Metallurgy* so satisfactorily to its customers and to the paper in the Middle West, has been appointed manager in that territory for THE ENGINEERING AND MINING JOURNAL, vice Mr. George S. Scott resigned. Mr. Holman's headquarters will continue to be in Chicago, with offices at 520 Monadnock Block, the premises formerly occupied by him. The offices heretofore occupied by THE ENGINEERING AND MINING JOURNAL, at 737 Monadnock Block, have been given up. Mining engineers and others connected with the mining or metallurgical industries, when visiting Chicago, are invited to have their letters addressed in care of THE ENGINEERING AND MINING JOURNAL, 520 Monadnock Block, and to make that office their headquarters.

SOMETHING OF the development of the export trade is shown in the report of the Bureau of Statistics of the Treasury Department from which it appears that we exported merchandise to the value of \$1,438,083,990 in 1901. A comparison of our foreign trade with that of Great Britain shows that in the six years from 1896 to 1901, there has been an increase of over 30 per cent in the exports from the United States while the appreciation in the trade of Great Britain was only 15 per cent. The growth in our foreign commerce is further emphasized by the fact that in 1901 our exports were only 17 per cent less than those of Great Britain, whereas in 1896 we were 33.4 per cent behind our trade rival. Our progress is due in large part to the heavy movement in mineral products, and their manufactures, notably iron and steel, copper and petroleum. On another page we publish a table giving some interesting statistics of these exports.

IN A PAPER read recently before the Civil and Mechanical Engineers' Society of England, Mr. A. S. E. Ackermann made some interesting comparisons between British and American coal mining, particularly in regard to the use of mechanical appliances. Mr. Ackermann has just completed a tour through the coal-producing regions of the United States and speaks from personal observation. He calls attention especially to a group of eight mines, operated by one company in Pennsylvania, where hand labor is reduced to a minimum, the mines being equipped with electric haulage, while all of the coal is mined by machinery. In these eight mines alone 220 coal-cutting machines are in use, whereas the total number of machines used in English coal mines in 1900 was only 311. The machine-mined coal product of the United States in 1900 was equivalent to 25 per cent of the total bituminous output; in great Britain only 1.8 per cent of the product was mined by machines.

THE OUTPUT of pig iron from the German blast furnaces for the full year 1901 has been published by the Union of German Iron and Steel Makers, and the figures are given below, in metric tons:

	1900.		1901.	
	Tons.	Per cent.	Tons.	Per cent.
Foundry iron.....	1,487,929	17.8	1,512,107	19.4
Forge iron.....	1,587,194	19.0	1,356,794	17.4
Bessemer pig.....	495,790	5.9	464,036	6.0
Thomas (basic) pig.....	4,780,829	57.3	4,452,950	57.2
Totals.....	8,351,742	100.0	7,785,887	100.0

It is somewhat remarkable that there should be an increase of 1.6 per cent in foundry iron, when the falling off in forge iron was 14.5 per cent. In steel pig the decrease was 6.3 per cent in bessemer, and 6.6 per cent in basic iron. The total decrease was 565,855 tons, or 6.8 per cent, nearly all of which was in the second half of the year. The production of iron last year was less than that of 1899, as well as 1900; the decrease being the first shown in Germany in any year of the past ten.

Since the opening of the year a slight improvement is reported in the German iron trade, but the production seems to be still greater than the consumption, and great efforts are being made to push the export trade.

THE LETTER from Johannesburg which we publish in another column gives some interesting particulars of present mining conditions in the Transvaal. Mines are under strict military regulation, and though Johannesburg is gradually filling up the number of men permitted to come to the mines is limited. There is no doubt that when the restrictions are removed there will be a great rush to the Transvaal, and probably a surplus of white labor for a time; a condition which anyone who is thinking of going to South Africa should consider carefully.

A frank and somewhat amusing admission of our correspondent is that mine managers generally believe that the whip is the only means of preventing petty offenses by the negro "boys" who constitute a very important part of the laboring force at the mines. From this point of view they prefer to have the Kafirs from Portuguese East Africa, because they are "stupid"; that is, they submit to the lash without objection, while the more sophisticated Zulus and Basutos of the Transvaal know that this form of discipline is illegal and are apt to make trouble. There would seem to be room for a black miners' union in the Transvaal.

IN THE notice of the finding of platinum in Wyoming in a recent issue of the ENGINEERING AND MINING JOURNAL the name of the discoverer was incorrectly stated. The JOURNAL is informed by one of its trusted contributors that the discovery was made through the discrepancy in the assay reports of silver in the ores from the Rambler Mine. One of these reported an unusual amount of silver and another a little or no silver. Mr. E. E. Burlingame, of Denver, found that this discrepancy was due to platinum and made the first report to Dr. L. D. Godshall, of Encampment. Later assays were made by both Mr. Woods, also of Denver, and by Mr. Burlingame, and the presence of platinum was confirmed. This statement is made upon unquestioned authority.

The location of the mine from which the platinum was obtained is 45 miles southwest of Laramie in the Medicine Bow Mountains of Albany County, and is some 25 or 30 miles from the town of Encampment. In the previous notice it was stated that the mine was located in Carbon County. This, it appears, was erroneous.

### MARKET CONDITIONS.

The iron market continues to show uninterrupted activity, and the demand for finished material is fully

up to the capacity of the mills in most lines, while in a few it is running ahead. The principal feature during the past week has been the demand for structural steel, and it is evident that building operations on an extraordinary scale are planned for the coming summer in nearly all our large cities. Of course there is a good deal of comment on this state of affairs and a good many predictions that building is being overdone. This is quite possibly the case, but it must be remembered that we are now making up for several dull years and an excess in the other direction is to be expected. At present, however, there are no signs of a cessation in the movement.

After the large business reported last week the copper market seems to have suffered a slight reaction and is quieter with a small decline in prices. Foreign orders seem to have been supplied for the present, but may very probably be renewed a little later.

In lead business continues only fair with no special change. In spelter transactions have been good, and the demand appears to be very steady. There are again rumors that the proposed consolidation of smelting plants is to be carried through, but the promoters decline to make any positive statements, dealing only in general assertions and not too much confidence is felt in the final outcome. Tin continues in good demand and supplies are somewhat better.

The western coal trade continues to depend chiefly upon the railroads, and transportation has been somewhat interfered with by stormy weather. In Chicago supplies of soft coal are reported to be running short, and the same is the case in one or two other large western cities. This condition, however, will be past as soon as railroad tracks are generally clear from the effects of the late storms. Supplies in the Lake Superior District, however, are said to be getting low, and there is some discussion about the rates which can be secured for all-rail shipments to Duluth.

#### TITLES TO MINING PROPERTY.

A correspondent who has had long experience in mining in Montana calls attention to a condition of affairs which has caused and is causing much injury to the mining industry in that State. We may add that the same embarrassment is not unknown in other mining communities in the West.

During the past six months the applications for mineral surveys passing through the Surveyor General's Office at Helena, in Montana, have exceeded any like period in the history of the office. Many mining deals that otherwise would have gone through have fallen down simply because of the unsatisfactory state of the mineral title. Generally, claim holders are content to do work enough to cover the annual requirements as to hold the claims year after year. When capital is attracted by the mineral showing trouble begins. Nearly every prospector in a district is acquainted with the legal status of each individual location of the district. Nine out of ten of those prospectors stand ready to attack the validity of the location through some technicality. Any time previous to the appearance of the capitalist on the ground, the claim holder would have had no trouble in perfecting his title; the intention of the others is to hold up the moneyed man. A mining claim worth holding by doing the annual work required is worth patenting, thereby forestalling would-be blackmailers. If the State should require a locator to have the location surveyed within a reasonable time and properly recorded, the record being made to conform with the field notes of some competent surveyor, much of this blackmailing would be stopped. Our corres-

pondent's observation has been that three out of four declaratory notices posted by the average prospector on a claim are defective, either through carelessness or ignorance of the requirements of the law. While these defects are hardly ever vital, the courts being inclined to place a liberal construction on the law in the case, and on the good intent of the locator, much trouble might be saved by more care in making the location.

The average capitalist does not care to invest money unless he knows what he is buying. He wants at least a reasonable certainty as to the title of the property offered him, and above all he does not want to buy a lawsuit. Too often the party who is inclined to buy mining property is made to feel that he is considered fair prey for the whole district; and his natural inclination is to drop mining investments altogether. Our correspondent's warning is worth careful consideration.

#### THE UNITED STATES STEEL CORPORATION.

We gave last week a summary of the report of the United States Steel Corporation, showing its operations for the nine months from the date of its organization to the close of 1901, and then took occasion to commend the policy of full and open statements so strongly in contrast with that pursued by other corporations. A closer examination of the report impresses the reader with the magnitude of the figures involved in the statement. We do not so much refer to the capital stock exceeding one billion dollars, or the bonded debt of nearly \$363,000,000, but to the inventories showing the current assets of the corporation. These inventories represent raw material carried, iron and steel manufactured, or in process of manufacture, and finished material of all kinds in transit or in stock. The total amount of these items as given in the balance sheet was \$95,603,997. It is true that at the date at which the inventory was taken the stock of raw materials included the iron ores on hand for use during the season of closed navigation on the lakes, and was, therefore, somewhat larger than it would have been in the spring or summer. This difference, however, represents but a small portion of the total, and the fact remains that the company must, so long as it continues to do business on the present scale, carry between \$80,000,000 and \$100,000,000 in this inventory. This amount with the cash balance of about \$50,000,000 is the working capital which the company must always have on hand. No other corporation ever had such an enormous balance. The amount, indeed, would only a few years ago have been considered extraordinarily large as the total capital of a company. Another item which attracts attention is that of \$18,451,000 reserved for depreciation of properties, improvements and renewals, and this again shows the enormous scale on which operations are conducted.

The report indicates the directions in which it is proposed to effect economies in management through consolidation. The first of these is the systematization of the leading departments like ore mining, coal mining, coke manufacture, and the transportation of ores, which of course can be more economically and more efficiently conducted on the largest scale. The second economy in which considerable progress has already been made is in concentrating the manufacture of various products at the most favorable points for production and distribution, and the assignment of special lines of work to different mills. Perhaps the most important point of all, or, at least, that which will be most important in the future, is the fact that there has been established a system for constant interchange of views and information among the different plants so that every mill or plant operated by the company will

have at once the full benefit of any improvement or economy in production introduced at any one of the others. Instead of having a plant confined to the experience gained within its own limits, each one has the advantage of the combined experience of all.

#### THE ROSSLAND MINERS' STRIKE.

We have had occasion from time to time to chronicle various demands made by the Western Federation of Miners and various offenses against law and order, ranging from simple assault to arson or assassination, following the refusal of these demands by mine owners. We need recall only the bloody deeds in the Coeur d'Alenes, Idaho, from 1892 to 1898, ending with the destruction of the Bunker Hill and Sullivan Mill and certain strikes in Colorado, the last at the Smuggler Union Mine, near Telluride, a few months ago. Certainly the Federation has not been noted for moderation in its demands nor for gentleness in enforcing them. On the contrary, its history is a fair parallel in most respects to that of the Molly Maguires, who terrorized the anthracite districts of Pennsylvania some 30 years ago. We confess, therefore, to a certain amount of pleasure in learning that the last strike which the union precipitated has ended in absolute defeat, more especially as any yielding or compromise by the companies affected would have opened the way for a long series of troublesome disputes and petty wrangling such as seems likely to be the lot of the mines at Telluride, Colo., where the union won out. The British Columbia mine owners deserve to be congratulated on their firmness, and the mining towns of the province can look forward with confidence to freedom from labor disturbances for some time. In passing, it may be said that much of the credit for the result is due to the new management of the Le Roi Mining Company, and the other companies have reason to be grateful for its firm stand.

The termination of the strike is of such importance, not only to British Columbia, but from its moral effect, to Washington, Idaho and Montana, that a brief history of its cause, progress and final collapse is in order. We take pleasure, therefore, in summarizing from the admirable report of Mr. W. L. McKenzie King, of the Dominion Labor Department.

The Western Federation of Miners is a body composed of all persons working in and around mines, mills and smelters, organized into unions and paying a per capita tax to the federation. The territory covered by the federation is divided into six districts, five of which are in the United States, while the sixth comprises the territory north of the United States boundary. The Miners' Union, at Rossland, chartered in 1896, is represented in this sixth district.

In March, 1901, a smelters' union was formed at Northport, Wash., under the Federation. Shortly after, it is said, certain carpenters, members of this Northport union, were told by the smelter management that they would have to leave the union or the company's employ. The union, therefore on the ground of self-protection, declared a strike on May 24. The Northport Smelter is owned by the Le Roi Mining Company, and members of the Rossland Union were employed in the company's mines. On July 3 the Rossland Union decided that a vote should be taken the following day as to decide whether or not a strike should be declared for an increase in the wages of muckers from \$2.50 to \$3 a day. It is claimed that this decision was irregular and that the action of the meeting was directly contrary to the constitution and by-laws of the Western Federa-



tion of Miners. However, a secret ballot was taken on July 4, at which time there were between 700 and 900 resident members in good standing in the Rossland Union. The officers in charge of the ballot stated that 354 votes in all had been cast, and that there were four or five votes in excess of the three-quarters required to declare a strike. The union, however, did not as required by its constitution give 15 days' notice to the executive board of the federation and justified the irregularity of its acts by the statement that the situation was urgent and that secrecy was desirable. It is said, however, that by another ballot only a short time before the decision of the union had been against a strike, and it is openly charged that the final decision was obtained by fraud. An increase in the wages of muckers was made the immediate cause of the strike, but a strike would probably have come any way as the union for some time had suspected that the mining companies were determined to break up the organization, and it would have strengthened the hands of the companies if miners had kept at work in Rossland when a strike was on at Northport. There were, therefore, three causes for the strike: (1) A sympathetic strike in favor of the Northport men; (2) a settlement of the demand for an increase of muckers' wages from \$2.50 to \$3 per day, and (3) the resolve to end future discriminations by the companies against union men—this last being undoubtedly the most important cause.

When the strike was declared on July 11 over 1,000 men were called out, including all classes of employees about the Le Roi Mine, the War Eagle and the Center Star mines, and several smaller properties. The mines closed entirely and remained closed some time. The managers stated from the first that the companies were not able to grant the increase in wages and that they were unwilling to recognize the union in any manner. At the same time they would not discriminate between union and non-union men, but simply refused to have anything to do with the officers of the union. Several attempts by individuals or by representatives of various interests to effect a settlement proved fruitless. The Le Roi Company began as soon as possible to fill the places of those on strike, taking on any applicant who was competent. The War Eagle and Center Star companies decided to keep their mines closed for a while.

As summer and autumn passed a large proportion of the strikers drifted away to other camps, until by November there were less than 200 of the strikers still at Rossland. A few attempts by some hot-headed strikers to intimidate non-union men had been promptly suppressed by the civil authorities. Mr. King states that on November 11 he received communications from Messrs. Frecheville and McDonald, of the Le Roi Company, and Mr. Kirby, of the War Eagle, stating that there was then an abundant supply of labor and that it was useless for the companies to discuss a condition of affairs which no longer concerned them. The officials of the Rossland Union, when interviewed by Mr. King, were unwilling to call a meeting at which the communications of the mine managers might be read, nor were they willing that the union should take a vote on continuing the strike, justifying themselves by the statement that it would not do to declare the strike off without receiving some definite acknowledgment from the mining companies as to increased wages.

The union officials maintained this attitude several months and the companies continued to employ what applicants they needed, having no apparent trouble in getting a sufficient supply of labor. Finally, on January 24, the secretary of the Rossland Miners' Union announced that the strike was settled by an

agreement satisfactory to both parties. The men were to return to work according to the terms of the agreement, "which by mutual consent are to be withheld from the public. Negotiations not yet completed are being carried on with other mining companies, but are not yet completed." Evidently such a statement is a plain confession of absolute defeat and the members of the union still in Rossland return to work at the company's terms.

A defeat like this evidently is of far-reaching effect. It is scarcely probable that the Western Federation of Miners will be able to do much in British Columbia for some years, and the professional agitators and riot inciters will find small use for their services there. This view is confirmed by the results of recent municipal elections in Nelson and other cities, where the labor tickets and the representatives of disorder were signally defeated. The result is of importance to the Coeur d'Alene country also, and in view of certain recent occurrences in connection with the Butte copper mines it is by no means impossible that Butte may not have labor troubles before the year is out. If such troubles arise it is to be hoped that the management of the larger interests in Butte will show a Le Roi firmness in dealing with the infamous gang that has controlled for its own ends an organization which could have promoted fair dealing between miners and employees and have advanced the prosperity of the whole Rocky Mountain region. As it is, the Western Miners' Federation has so often shown a narrow, cruel and cowardly spirit that it is recognized generally as a curse to mining in the Northwest, and its final defeat and disruption will be a cause for general congratulation.



#### IMPROVEMENTS AT THE GRANBY SMELTERS, BRITISH COLUMBIA.

The smelting works of the Granby Company, at Grand Forks, in British Columbia, have already been described in our columns. The latest addition to these works is a converting plant, which was put in operation January 13. Previous to this the works have shipped the copper and other metals in the form of matte, but now shipments are made as blister copper, which is sent to eastern works to be refined and have the gold and silver values separated. Including the matte from the Granby furnaces with that from the Greenwood smelter and the Hall mines, it is expected that about 1,200 tons of blister copper will be shipped monthly. This will be increased to 1,500 tons when the two additional furnaces, now under construction at Grand Forks, are completed.

The converter building is a steel, fireproof structure, 160 by 68 feet, its height in the main portion being 35 feet. This building contains two stands of converters of the horizontal-barrel type. The shells are 72 inches in diameter by 100 inches in length. A 40-ton traveling crane, worked by electricity, handles the shells and matte, and a 20-ton reverberatory tilting furnace. The plant also comprises a quartz-crushing machine and grinding pan for mixing the converter linings. There are three mould carriers under each converter stand, and they are operated back and forth by a hydraulic ram.

Adjoining is the engine room, containing the blowing engine for blowing the converters, as well as the hydraulic pump that furnishes the pressure to operate the plant in the converter building. The blowing engine is run by a belt from a 200-h. p. alternating motor. It is of the power type, has an air cylinder 36 by 36 inches, and has a special unloading device attached, so that when the pressure reaches a maximum of 12 pounds the valves remain open, and no power is used when the converter is not using air.

A 10-ton traveling electric crane connects the converter building with the furnace building, 100 feet

distant. The crane takes the molten matte and conveys it to the converter building, where it automatically pours the matte into the tilting reverberatory furnace. When the converter is ready for a charge the 40-ton crane places a large matte ladle in front of this furnace and by hydraulic power the furnace is tilted until there is enough for a charge.

The large crane then transfers this hot matte to the converter, into which it is poured. The converter is thereupon turned into an upright position, and the blast turned on. The blast pressure is 10 pounds per square inch, and it is maintained until such time as sufficient slag has formed. Then the blast is turned off and the slag skimmed into a large ladle. This ladle is then carried by a crane, and the slag is poured hot into the tilting furnace. The converter is next blown for a short time, when the matte is converted into metallic copper, still retaining its gold and silver values.

The moulds on the carriages are now brought into position by the hydraulic ram, and the copper is slowly poured out of the converter into the moulds. The converter is now ready for another charge.

The time occupied in converting a charge into metallic copper varies from 2 to 4 hours, depending upon the grade of copper matte. This process effects a saving of 50 per cent in the weight of metal that has to be shipped to the refinery. Each member of the set of converters has a capacity of from 50 to 70 tons of matte daily.

The plant in the power house has been increased by a 250-h. p. horizontal turbine waterwheel and a 250-h. p. electric generator, directly connected with the water wheel.

For the purpose of supplying water to granulate the slag, there have also been installed two additional triplex power pumps, each with a capacity of 750,000 gallons daily.

The construction and installation have been under special charge of Superintendent A. G. W. Hodges, to whom credit is due for many details of the plant, as well as its general design.

#### CLAY IN INDIANA.

BY OUR SPECIAL CORRESPONDENT.

State Geologist Blatchley is in receipt of numerous inquiries from over the country as to the natural resources of Indiana and the opportunities for investing capital. In answer to a recent inquiry from New York he said that during the last three years a large amount of capital has come into the State for investment in clay, oil, stone and coal mining industries and that these industries are attracting more attention from capitalists out of the State than from Indiana's wealthy men.

The investments in clay have been large, and there is not one of these industries in Indiana that has for three years been able to keep up with orders. Clay mines and clay-working plants have been opened and established recently at Hillsdale, Terre Haute, two at Brazil and two at Montezuma. Chicago capitalists have large investments in these concerns. Three years ago Indiana stood thirteenth in the lists of States that turned out clay products. It now stands sixth and will likely push to the front. The clay mined in the State is made into brick of various kinds and purposes, sewer pipe and conduits. The plants and mines that are now in operation have only scratched the clay deposits of Indiana, and some of the most valuable beds are untouched, according to Mr. Blatchley. In some localities the companies are not only getting clay in valuable quantities, but beneath the deposits coal is also found, which is used to burn the clay into the manufactured product.

**SULPHATE OF AMMONIA IN GREAT BRITAIN.**—The production of sulphate of ammonia in Great Britain in 1901 was: From gas works, 148,500 tons; iron works, 16,000 tons; shale oil works, 36,500 tons; coke ovens, etc., 19,000 tons; total, 220,000 tons; showing an increase of 7,000 tons over 1900.

## THE MINING DISTRICT OF GUANAJUATO, MEXICO.

SPECIAL CORRESPONDENCE.

In order that the conditions existing in Mexico as a country, and of Guanajuato as a mining camp, may be the better understood, a condensed account of such historical, political, and statistical matters as have a direct bearing upon the standing of the country and of this camp to-day should be given, even though some well known facts are repeated.

This camp is so old that its discovery dates back almost to the year when the country was conquered by the Spaniards, and it is necessary therefore to start from the date of the conquest.

So far as possible references to the authorities quoted will be given, but in many cases this will not be possible, as the general facts have been gathered from a six years' residence in the country, and much of the information is the result of long miscellaneous reading of Spanish and Mexican books and periodicals and conversation with well informed people.

### HISTORICAL AND POLITICAL.

From the years 1520 to 1530, A. D., the Spaniards were occupied in conquering the original inhabitants of Mexico, and their position was too precarious to permit them to explore the country outside the city of Mexico. After the latter date, however, a settled Government became established, Mexico becoming a province of Spain, governed by a Viceroy, and the conquerors spread themselves over the country establishing farms and mines at such points as recommended themselves. Although the Spaniards intermarried with the Mexicans, it became the rule of the Spanish Government (continued during the entire three centuries during which Mexico remained under Spanish control), never to appoint even to subordinate offices any person born in Mexico. Every official was appointed from the mother country, and brought with him the old world prejudices and convictions and a contempt for all Mexicans, even though they might be of Spanish descent. In other words, Mexico was used as a feeder for Spain, and in addition to being governed by men whose only object was to quickly attain a fortune and return to Spain, it was also taxed to the utmost limit for the benefit of the Spanish Crown. Under these circumstances its development was naturally slow, and had it not been for the immense natural advantages of the country, the result would have been its depopulation and abandonment. Nature, however, has made Mexico one of the richest countries on the globe as regards the productiveness of its soil and its mines, and the Spaniards who came to Mexico as emigrants and had no connection with its government speedily realized this fact. These were the ancestors of the Mexicans of to-day. From the very start these people realized the tyrannical nature of the Spanish Government, to escape which they began at once to spread out to more distant portions of the country where they might settle and lead an undisturbed life, although the immediate vicinity of the city offered ideal conditions for settlement. They stood the oppression of the Spaniards for three centuries, but finally followed the example of our forefathers and threw off the burdens of a monarchical government.

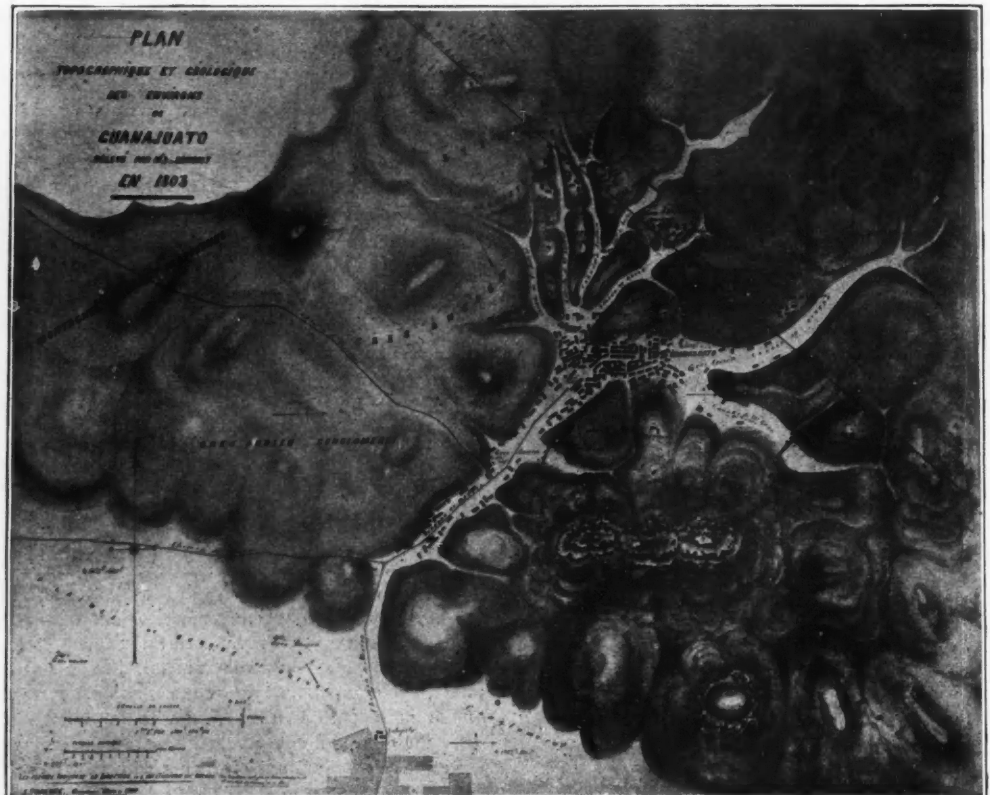
The Mexican revolution lasted from the years 1810 to 1825. As a result of 15 years of war, the country was in a chaotic state, and the men who had come to the front in military affairs speedily began to quarrel among themselves as to who should govern it, and from this condition of affairs arose the constant revolutions which changed the form of government from year to year, and naturally prevented progress.

Revolution succeeded revolution until the year 1862, when Napoleon Third, taking advantage of claims against Mexico held by some of his subjects, began the war of the French Intervention, which lasted until 1866. From the French standpoint this

was never a successful war, and in many points bears a strong resemblance to the English-Boer war; the fighting was constant, and never for more than a few months at a time did the French control any points outside of Mexico City, and never for a moment did the Mexicans abandon their form of Republican Government, although constantly compelled to move its seat from place to place.

At the termination of our war of the Rebellion, this affair attracted the attention of the authorities in Washington, and as belief in the Monroe Doctrine was as strong then as now, immediate steps were taken to settle matters properly. Diplomacy having failed in France an American army of 100,000 men began to move toward the Mexican border, the war of the French Intervention became a thing of the past, and the French troops retired from Mexico. Napoleon Third did not come into contact with a victorious army of 100,000 men. The Republican Government of Mexico at once took control of affairs again, and as time progressed revolutions became fewer.

the finances of the country, furnishing means for the education of the masses and finally convincing the people that a policy of peace and a strong government were the means by which prosperity might be secured. To-day Mexico occupies a unique position among the Latin-American Republics as a result of Diaz's 20 years' government, and all Americans residing here felt convinced that the people of this country are so well satisfied, that upon the death of General Diaz the strong men whom he has in his Cabinet ready to succeed him and continue his policy, will find no difficulty in carrying on affairs along the lines mapped out by him, and no disturbance is anticipated. The result of this policy, continued for 20 years, has been to attract foreign capital to invest in a country whose natural resources, while so well known, have not been attainable in the past, on account of the revolutionary condition of the country. This inflow of foreign capital has been steadily increasing until last year statistics collated by prominent financial institutions in the city show that for every month



HUMBOLDT'S DRAWING OF GUANAJUATO DISTRICT, MADE IN 1803.

Among the Mexican generals during the war with France, the most prominent and successful was Porfirio Diaz, a man of the people with much Indian blood in his veins. Born in Oaxaca of poor parents, he made himself a lawyer, but upon attaining his majority abandoned a legal career for that of a soldier, and fought for his country during the French Intervention, speedily attaining prominence as a most successful organizer and fighter. When peace ensued he was elected by his district to Congress, and at once showed equal ability there. His first terms as President was in the later seventies. He at once showed administrative abilities, and indicated his desire to put the country on a peace basis and on the road to prosperity. The principal obstacle to this course was the state of brigandage existing in the country and the lack of communication between Mexico City and distant points of the country by which troops might be moved quickly to points where revolutions might spring up. The cure was the building of railroads by which this condition of affairs could be done away with and at the same time means furnished by which the products of the country might be cheaply transported.

President Diaz has steadily pursued this policy, nipping every revolution in the bud, naming honest men for all subordinate positions, straightening out

of the year 1900, \$10,000,000.00 of foreign capital entered the country to be invested in one form or another.

In order to trace the history of mining in the country it is necessary to go back to the period referred to in the beginning of this article, when the Spaniards began to spread out from Mexico City in search of points for settlement. The quantities of gold and silver found in the possession of the Indians by the Spaniards during the conquest indicated a richly mineralized country and but little time was lost in locating the mines best known to the Indians. The first mines opened up were within easy distance of Mexico City, mostly to the south and in the present States of Mexico and Guerrero. From 1530 to 1540, however, the conquest having been carried further north and the settlers and miners following its track, the mines of Zacatecas were discovered, located about 200 miles north of Guanajuato. In 1547 these had become so productive that a train of carts was established by an enterprising Spaniard between Mexico City and Zacatecas, a distance of nearly 500 miles. The road followed by these carts took them through the present La Luz section of the Guanajuato mining district, and in the year 1547, while halting for the night at this point, their camp fires disclosed a rich vein of silver



This discovery attracted attention to Guanajuato, and while some of the early miners worked at this first discovered point, others prospected the surrounding district with the result that in 1557 the Mother Vein of Guanajuato was discovered, and work was begun at the point covered by the present Rayas Mine, which owes its name to the discoverer. Here the immense vein crops out, showing in the present open cut a width of more than 300 feet, with good values at the surface. For many years the only method of mining known was that of building fires against the quartz of the vein, cracking off the rock by heat, and not for 50 years did drills and black powder come into use. In the early part of the seventeenth century this mine passed into the hands of a man named Sardeneta, and the title to the mine still remains in the hands of his

only ones worked. The region north of Cata was considered to be barren up to this time.

The means by which the great Valenciana Mine, which is north of the Cata line, was opened up are stated by Baron Alexander Humboldt, in his political essay on New Spain, from page 44, volume 2 of the Spanish edition, from which the following is quoted:

"In 1760 a Spaniard who had arrived as a very young man in America, began to work the vein at one of the points which until then had been considered barren. Obregon, as this Spaniard was called, was poor, but enjoyed a good reputation for honesty and secured friends who from time to time loaned him small amounts to continue his work. In 1776 his workings had reached a depth of 260 feet and the expenses were still in excess of the production. But Obregon, as devoted to mining as others of his race are to gambling, subjected himself to all kinds

The total production of the Valenciana Mines from 1760 to the present date, as taken from its own records, is about \$300,000,000. Its production during certain periods will be found in the annexed tables.

The principal shaft of the Valenciana Mine is 1,686 feet vertically, the inclines from it bringing the total depth of the mine to over 2,000 feet, at which point it was left in ore worth \$40 per ton, but which with the means at command was not pay ore.

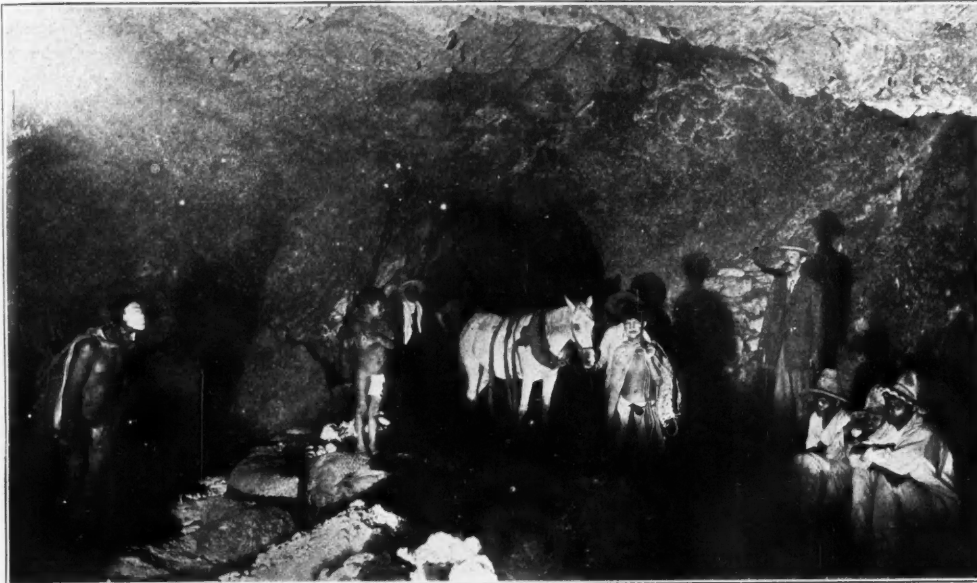
There are also on the mine six other vertical shafts varying in depth from 550 feet to 1,200 feet. This mine, as well as those of Secho and Cata to the south, is in the possession of the heirs of Miguel Rul, one of the descendants of the original Obregon and is still producing.

The striking of the bonanza in Valenciana caused prospecting to be carried further north and the mine of Alizos, now included in Valenciana, sunk the Alizos shaft to a depth of 700 feet, cutting the vein in good ore and producing largely, but other prospects further north after sinking 200 or 300 feet and encountering only low grade ore were abandoned, and this portion of the vein to the north of Valenciana remained unexplored until 1895, when a Mexican stock company was organized to work the Esperanza Mine, about half a mile north of Valenciana. At a depth of 850 feet this mine has \$50 ore about 18 feet wide.

North of this mine comes the Buena Vista in the same formation as the Valenciana and Esperanza, viz:—syenite and diorite on the hanging wall of the vein, and schist on the foot, and there is no possible reason why proper investigation of this mine should not disclose a repetition of the great Valenciana Mine. The conditions are the same, and with modern mining and treatment charges the results should be much more profitable.

In addition to the Mother Vein, Guanajuato has two other vein systems which have produced and are producing large amounts.

La Luz District, in which as previously stated, the first discovery was made in 1547 is located about six miles southwest of the Mother Vein and its principal vein is nearly parallel with the Mother Vein.



UNDERGROUND VIEW, LA SIRENA MINE, GUANAJUATO.

descendants. Coming directly from Spain he brought with him the latest known mining methods, using iron drills, with black powder as an explosive, and mining by means of shafts and tunnels. His success was immediate, and the large bodies of ore almost immediately opened up necessitated the adoption of some means of reduction more economical than that of smelting, by which all ores had been reduced up to that time, and the discovery in Pachuca of the patio process of amalgamation was at once taken advantage of. The ores of the Mother Vein being of a very simple nature, this process was found to be especially adapted to them, so that within a short time the production of the Rayas Mine and its immediate neighbors north and south had become so large that 50 of these mills, with a capacity varying from 15 to 20 tons daily, had been started in Guanajuato. The principal chemicals used in this patio process are quicksilver, sulphate of copper and salt, and upon these, as well as the black powder used in blasting, the King of Spain levied a very high tax, which, in addition to the 20 per cent that, under the name of the King's Fifth, he collected upon all bullion presented for coinage, prevented the mining and treatment of ores carrying less than 100 ounces of silver per ton.

This condition of affairs lasted until Spain was driven from the country, and yet, in spite of this fact, which prevented the working of any but the richer mines, Mexico had produced during the Spanish possession nearly \$2,000,000,000 of gold and silver, of which Guanajuato, from the Mother Vein, produced about \$700,000,000. These figures are taken from the Mint records of the Government, still existing and can easily be referred to. From Rayas, explorations were carried north and south on the Mother Vein, the mines of Aparecida and Sirena to the south and those of Cata and Sacho to the north being opened up, and these mines until the middle of the eighteenth century were practically the



UNDERGROUND CHAPEL, LA SIRENA MINE, GUANAJUATO.

of privations rather than abandon his enterprise. In the year 1767 he formed a partnership with a merchant of Rayas named Otero. How could these two men then suppose that at the end of a few years they would become the richest subjects in Mexico and perhaps in the world? In 1768 they commenced to take from Valenciana large quantities of ore and as they attained greater depth and reached the same relative level as the ore bodies in the Rayas Mine, the grade increased and in 1771 they took out enormously rich masses of sulphides of silver mixed with ruby and native silver. From that year until 1804, when I left for Spain the yearly production did not fall below \$2,800,000 and the net profits to the owners has often reached \$1,200,000 per year. Obregon was made Count of Valenciana in the Spanish peerage, but in spite of his immense riches retained his simple habits and frank character."

The discovery of the Mother Vein in 1557 drew attention away from the first discovery in La Luz and scarcely anything was done there until 1832, when a company was formed to work the old mine. After ten years very rich ore was encountered and from 1842 until the present time the district has been a large producer. The best years, as shown by the tables accompanying this letter, were from 1842 to 1859. The total production of this district to date is put at \$100,000,000.

The grades of silver ore were higher than on the Mother Vein and in many points the gold ore was likewise.

The Santa Rosa District, in which the veins are

also parallel to the Mother Vein, lies about six miles northeast of the Mother Vein, and although worked to a small extent in the past, has not been entirely exploited until modern times. At present it is credited with a production of about \$2,000,000 per year, from a number of small but rich mines.

In 1824, at the end of the revolution by which Mexico attained its liberty, the country was impoverished and the mines of Guanajuato were among the greatest sufferers from the war. Their buildings and machinery had been destroyed and their workings as a result of 15 years' abandonment were in a very bad shape and filled with water. There was no capital in the country with which to reopen the mines, and the Secretary of the Treasury, Lucas Aleman, a young man 26 years old, conceived the idea of going to Europe for the purpose of interesting foreign capital, which under Spanish rule had not been permitted to enter the country. After securing prices on many of the principal mines he first visited France, but with no success and then went to England, where he was successful in securing the organization of two large companies, the United Mexican Mines Company and the Anglo-Mexican Mining Company.

The companies were organized with a paid up capital of £1,250,000 sterling in shares of £1,000 each, and operated in all Mexico with varying success, but finally confined their mining operations to Guanajuato.

In Guanajuato they were not able to purchase any of the mines, but obtained them on 13-year leases. The United Mexican Company having the mines of Rayas, Cata and Sacho, and the Anglo-Mexican Company those of Valenciana and Sirena.

The former company was the more successful in its operations and paid many dividends from the products of its mines on which it succeeded in obtaining a 13-years' renewal. After this second lease it transferred its operations to the La Luz District where it was also successful, and to-day, after 77 years' experience in Guanajuato it owns or controls some 30 mining properties covering some 2,500 acres. Only a few of these are working, however. During all this time it has continued its mining business through all kinds of political changes and has not been molested except by occasional forced loans from the Government in revolutionary times. These, however, have always been returned.

The other company, the Anglo-Mexican, was less successful in its mining operations and finally confined its operations to the mints, and when the Government took them away, some 15 years ago, the company was dissolved. The conditions under which these companies did business and made money would appear impossible to us, as their management was both ignorant, expensive and corrupt, but in spite of these detrimental features, their books, of which the writer had charge for some years, show large profits.

#### ECONOMICAL AND STATISTICAL.

Under the first of these may be considered the pay rolls of the Victoria Mine, which show the prices paid to-day for labor and supplies. These are very cheap, and yet as miners these people are unsurpassed, having as they do the inherited instincts of ten generations of miners. As mechanics they readily become acquainted with ordinary machinery and as carpenters, masons and ironworkers they are the equal of any people in the world. As regards the matter of treatment and reduction of ores it needs to be said that the values shown in the production tables for years previous to 1890 are almost entirely the result of ores amalgamated in the patio mills, as previous to that date there were no large smelters in the country and ores below 500 ounces silver would not stand exportation charges to other countries. The result is that these values, which are almost entirely mint records, represent about 85 per cent of the silver values and less than 50 per cent of the gold values of the ore extracted, these figures representing the percentages recovered in times gone by, by the patio process of amalgamation. A simple explanation of this

process which is used very extensively throughout Mexico, Central America and South America, may not be amiss here.

The ore arrives at the mill broken up to the size of very coarse coal. Before sampling, it is crushed to pass through  $\frac{1}{4}$ -in. mesh in a Chilean mill operated by mule power and consisting of a stone wheel about 12 feet in diameter and 2 feet thick, with an iron or steel rim revolving on its own axis and also traveling around a circular space about 30 feet in diameter. The ore is thrown under it and after being ground to the desired size is thrown by hand against an inclined screen through which, when ground to the proper size, it falls to the floor. The capacity of one of these Chilean mills operated by six mules, frequently changed, is about 15 tons per day. After this preliminary grinding, the ore is sampled and assayed and then passed to the second grinding in the arrastras. These are circular pits, about 8 feet in diameter and 3 feet deep, walled up above the floor for another foot. Their bottom is formed of very hard stone set up on end,



MINERS IN LA SIRENA MINE, MEXICO.

and in the center is a pivot upon which a beam is fixed extending beyond the sides of the pit. From this beam are hung heavy stones, which when the beam is moved, drag over the bottom of the arrastra, reducing the ore to about 80 mesh. The beam is operated by a mule attached to its outer end. These arrastras have a capacity of 800 pounds each 12 hours and each mill has from 30 to 100 of them.

When the gravels are thrown into the arrastra, water and quicksilver are added so that amalgamation of some of the free gold in the ores takes place here, only the proportion saved is much less than on the plates of a stamp battery. After grinding and when from 200 to 500 tons of ore are obtained the slimes are taken out of doors and distributed over a large stone floor to a depth of about 2 feet, a 500-ton "Torta," as these masses of wet ore are called, covering a space about 500 feet square. More quicksilver, sulphate of copper and salt are added, as in the pans of a pan mill, and then for about 8 hours daily, horses are driven through this mass of slimes for the purpose of agitating it to permit freer chemical reactions and to insure the exposure of all parts of the mass to the heat and light of the sun.

This continued for from 10 to 30 days, depending upon the season of the year and the heat of the sun, frequent assays being taken to decide the state of amalgamation, and when no further increase in the percentage of silver amalgamated is noted the process is considered ended. The "Torta" is then removed to settlers and the amalgam is separated from the tailings by agitation and is then retorted.

But little gold is saved in this latter process, the bars generally running from 990 fine to 999 fine, with about 1 per cent gold. The average saving of silver by this process, as noted in the results of 20 of these mills for a period of 20 years, was 92 per cent, including a further slight saving secured by buddling the tailings by hand. The saving of the gold is variable, reaching 60 per cent when there is much free gold, and not passing 40 per cent when the gold is carried in the form of sulphides as is usual. The results in combination stamp mills, concentrating on tables and with amalgamation of the tailings in the pans, have been from 70 to 80 per cent of both silver and gold, but the process is equally expensive, the cost in patio mills averaging \$9.69 Mexican currency per ton, and in a 20-stamp mill reaching \$11.

As all gold values given in the tables are the result of this process, it can be seen that the actual gold values extracted from the mines are quite double those of the tables.

During the past year, Mr. W. Leonard Holmes, the well known cyanide expert, spent some four months experimenting in the mill of the Guanajuato Consolidated Mining and Milling Company, owners of the Sirena Mine, with the cyaniding of these ores and in a long detailed report on the matter published by the company he claims to secure 90 per cent of the silver and gold values in a 128-ton per day plant, at an expense for crushing, concentrating and cyaniding of about \$7 per ton Mexican.

As regards the cost of mining, no figures for work done under modern methods of hoisting, etc., can be given, but under the present methods of carrying everything on men's backs, the cost of producing 50 tons per day is about \$5 per ton, and it is almost sure by proper and intelligent direction of the cheap but good labor, which is so plentiful, that a mine producing 100 tons per day could reduce the mining cost to \$2 per ton at least.

In regard to the average grade of ores, Mr. Charles B. Dahlgren, M. E., in his work, "Historical Mines of Mexico," gives, as the result of careful investigations, the following data:

Average in 1782.....	102 ounces silver per ton
Average in 1803.....	80 " " " "
Average Rayas Mine.....	140 " " " "
Average in 1737.....	175 " " " "
Average in 1791.....	98 " " " "
Total average for all time.....	70 " " " "

and the average gold assay, 0.6 ounce per ton.

Putting these latter figures into American currency, the average value per ton for silver and gold combined would be \$52 U. S. currency per ton, or in Mexican money at the present exchange rates, \$113 per ton.

The grade taken down and sold these modern days is, however, lower and will not average better than \$60 per ton Mexican, the cheaper chemicals and supplies and improved milling methods rendering less sorting necessary, and making it more economical to mine and mill these lower grades of ore.

Dahlgren puts the annual production at 350,000 tons, but this is evidently an error.

The production to-day is about 500 tons daily, of which 450 tons are milled and 50 go to the smelter.

The principal authorities quoted in this article have been Baron A. de Humboldt, "Political Essay on New Spain;" Petro Lopez Monroy, "Annales del Ministerio de Fomento," published by the Government in 1886; H. C. Ward, Esq., Chargé de Affairs of Great Britain in Mexico 1825 to 1827, "Mexico in 1827," London, 1826; extracts from "El Minero, Mexicano," a monthly mining paper published in Mexico City; "Der Bergbau und das Amalgamation," Muster 1866; "De la production de Metaux Precieux au



Mexique," Paris, 1843; "Aufenthalt un Bersen in Mexico in den Jahren," Stuttgart, 1836; "Distrikte von Guanajuato in Mexico," Munster, 1886; "Annales de la Minería Mexicana," Mexico, 1861; and the reports of many Mexican mining engineers and college professors of mining on the district.

The principal Americans and citizens of other nations interested in Guanajuato are Messrs. Beach and Coffin of the General Electric Company, and Mr. Frank G. Corning and T. J. Hurley, all of the Guanajuato Consolidated Mining and Milling Company, of New York, operating the Sirena Mine. Messrs. Burns, Peck, Howbert, Wood, Hayes, Pomeroy, Thurlow, Connell, Avery, Piper, Williams, Hutton, Curtis and Bonbright, all of Colorado Springs, operating the Victoria and adjoining mines.

Mr. Dwight Furness, the American Consul and an ore buyer of 15 years' experience in the camp, Mr. E. B. Leigh, President of the Chicago Railway Equipment Company.

Messrs. Bradley, Arberry and Cody, of Middlebury and Detroit, Michigan.

Messrs. Palmer, Connor, Horace and Henry Devereux, of Colorado Springs.

The United Mexican Mines Association, Limited, of London, has many prominent London people on its board including Mr. Goschen, First Lord of the Admiralty.

Mr. E. A. Wiltsee, of the Seelye-Wiltsee Investment Co., Mr. S. S. Connor, of Connor & Grant, San Francisco, Cal.

The German Consul, Herr Heinrich Langenscheidt, a large mine owner.

Messrs. Stallforth, Alcazar & Co., of Hamburg and Bremen, and London.

The Hamburg-Bremen Mining Company, of Hamburg and Bremen. The Copenhagen Mining Company, of Copenhagen, Denmark.

Messrs. A. R. Baker and the Messrs. Adams of New York, of the Santa Rosa Mining Company.

Messrs. A. R. Baker and the Messrs. Adams of New York, of the Santa Rosa Mining Company.

Messrs. Hale & Co., bankers of Boston, Mr. A. J. Witherbee of Detroit, at the head of the Mexican Mine & Development Company, have many investments in the Republic, but have as yet done nothing in this district.

The Guggenheim and Kansas City smelters take the entire smelting product of the camp and are well posted regarding it.

The Banks of Guanajuato are, a branch of the Banco Nacional of Mexico, a branch of the Bank of London, each with a paid up capital of \$20,000,000 Mexican, El Banco de Guanajuato, capital \$500,000 Mexican paid up, and the private banks of Stallforth, Alcazar & Co., and the Dwight Furness Company.

In regard to the financial condition of the country, the only thing lacking to-day is a larger circulation medium. Although the Government coins from \$50,000,000 to \$100,000,000, Mexican silver per year, yet such is the demand from Asia for these Mexican dollars that sufficient of them do not remain in the country to furnish a circulating medium, and for this reason the Federal Government has lately given concessions for some 20 new banks, located in various parts of the country, and permitted to issue notes to the extent of their paid up capital, which varies from \$500,000 to \$2,000,000. These banks have in turn become stockholders in the Central Bank of Mexico City, which acts as a clearing house for them and from its surplus capital makes them such loans as they may need from time to time. The capital of this bank which was offered for sale was disposed of to J. Pierpont Morgan & Company.

These banks are all in a prosperous condition, paying from 10 to 20 per cent dividends and accumulating good reserve funds, but the business in the country is growing beyond their capacity and that of the circulating medium which they furnish, and some steps for increasing banking facilities will undoubtedly soon be taken.

PRODUCTION STATISTICS.  
Guanajuato from 1776 to 1803.

	Gold.	Gold and Silver.
1776 to 1775.....	\$3,032,060.00	\$30,320,503.00
1776 to 1785.....	4,669,286.00	46,692,863.00
1786 to 1795.....	4,868,266.00	48,682,662.00
1796 to 1803.....	4,913,265.00	39,306,117.00
Total.....	\$17,482,867.00	\$165,002,145.00

Guanajuato from 1830 to 1887—Mint Records.

	Gold.	Silver.	Total.
1830-39.....	\$1,998,880.00	\$25,853,750.00	\$27,852,630.00
1840-49.....	4,473,928.00	45,807,039.00	50,280,967.00
1850-59.....	5,799,816.00	57,238,322.00	63,038,138.00
1860-69.....	4,436,119.00	42,100,721.00	46,536,840.00
1870-79.....	3,383,740.00	42,130,000.00	45,513,740.00
1880-87.....	551,120.00	35,173,500.00	35,724,620.00

Total coined in 38 years.....	\$20,613,603.00	\$248,303,332.00	\$268,916,935.00
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Values Coined and Exported 1875 to 1887, Inclusive.

	Silver.	Gold.	Total.
1875.....	\$4,786,252.00	\$609,482.00	\$5,395,734.00
1876.....	4,544,127.00	506,565.00	5,050,692.00
1877.....	4,663,226.00	468,374.00	5,131,600.00
1878.....	4,675,896.00	448,722.00	5,124,618.00
1879.....	4,869,222.00	443,525.00	5,312,747.00
1880.....	4,587,231.00	394,807.00	4,982,038.00
1881.....	4,433,665.00	346,221.00	4,779,886.00
1882.....	4,660,309.00	372,790.00	5,033,099.00
1883.....	4,664,042.00	330,305.00	5,044,347.00
1884.....	5,343,336.00	462,154.00	5,805,490.00
1885.....	5,412,898.00	451,154.00	5,864,052.00
1886.....	4,673,769.00	391,628.00	5,065,397.00
1887.....	4,779,278.00	401,322.00	5,180,600.00
Total.....	\$62,093,251.00	\$5,677,049.00	\$67,770,300.00

Dividends Paid by the Combined Mines of La Luz and San Jose de los Muchachos Adjoining and Property of Same Owners from 1843 to 1859.

Year.	No. of Dividends.	La Luz.	San Jose.	Total.
1843.....	12	\$45,248.00	.....	\$45,248.00
1844.....	55	701,933.02	.....	701,933.92
1845.....	45	58,228.00	.....	58,228.00
1846.....	51	1,006,752.00	.....	1,006,752.00
1847.....	69	961,600.00	\$844,316.97	1,825,916.97
1848.....	101	1,326,612.00	1,087,932.23	2,414,544.23
1849.....	86	596,000.00	1,906,425.00	2,502,425.00
1850.....	76	332,500.00	1,523,265.23	1,845,765.23
1851.....	81	408,500.00	1,648,299.85	2,056,799.85
1852.....	74	720,443.03	1,356,222.29	2,076,665.32
1853.....	75	148,355.33	477,411.66	625,766.99
1854.....	104	135,672.48	193,089.09	328,761.57
1855.....	97	55,231.04	282,567.23	337,798.27
1856.....	75	9,765.65	241,385.16	251,150.81
1857.....	52	.....	323,908.29	323,908.29
1858.....	51	.....	162,153.93	162,153.93
1859.....	20	.....	27,466.46	27,466.46
Total.....	1,124	\$7,916,841.45	\$10,074,443.39	\$17,991,283.84

Guanajuato, 1766 to 1887.—122 Years.

Year.	Silver.	Gold.
1766-75.....	\$29,090,480.00	\$1,230,020.00
1776-85.....	44,890,280.00	1,802,580.00
1786-95.....	47,679,560.00	1,003,100.00
1796-99.....	20,247,689.00	888,250.00
1800-09.....	50,756,950.00	2,742,676.00
1810-19.....	19,790,635.00	753,848.00
1820-29.....	10,934,757.00	797,776.00
1830-39.....	25,853,750.00	1,998,880.00
1840-49.....	45,807,039.00	4,473,928.00
1850-59.....	57,239,322.00	3,769,816.00
1860-69.....	42,100,721.00	4,436,119.00
1870-79.....	43,641,723.00	4,533,668.00
1880-87.....	38,654,529.00	3,200,380.00
Total.....	\$476,585,531.00	\$33,630,941.00

Total.	Average per year.	Per cent. gold value.
\$30,320,500.00	\$3,032,050.00	4.95
46,692,860.00	4,669,286.00	3.86
48,682,660.00	4,868,266.00	2.06
21,135,935.00	5,283,980.00	4.20
53,498,626.00	5,349,862.00	5.13
20,644,453.00	2,054,448.00	3.67
11,732,533.00	1,173,253.00	6.79
27,853,630.00	2,785,263.00	7.02
50,280,967.00	5,028,097.00	8.89
63,008,138.00	6,300,814.00	9.16
46,536,840.00	4,653,684.00	9.54
48,175,391.00	4,817,539.00	9.41
41,754,909.00	5,219,364.00	7.66
\$510,216,472.00	\$4,182,102.00	6.50

Value of Gold and Silver, Given in Periods of Ten Years from 1690 to 1887.

From	To	Value
1690 to 1699.....	.....	\$48,371,035.00
" 1700 to 1709.....	.....	51,731,034.00
" 1710 to 1719.....	.....	65,747,027.00
" 1720 to 1729.....	.....	84,153,223.00
" 1730 to 1739.....	.....	90,529,730.00
" 1740 to 1749.....	.....	111,855,040.00
" 1750 to 1759.....	.....	125,750,094.00
" 1760 to 1769.....	.....	112,128,850.00
" 1770 to 1779.....	.....	165,181,729.00
" 1780 to 1789.....	.....	193,504,554.00
" 1790 to 1799.....	.....	231,080,214.00
" 1800 to 1809.....	.....	226,285,716.00
" 1810 to 1819.....	.....	120,863,056.00
" 1820 to 1829.....	.....	100,088,718.00
" 1830 to 1839.....	.....	120,124,828.00
" 1840 to 1849.....	.....	153,062,941.00
" 1850 to 1859.....	.....	174,850,949.00
" 1860 to 1869.....	.....	182,781,636.00
" 1870 to 1879.....	.....	234,920,447.00
" 1880 to 1887.....	.....	213,733,164.00
Total.....	.....	\$2,806,744,295.00

These figures are based upon the carefully collected statistics of Treasurer Orozco y Berra, published in the periodical "La Moneda en Mexico," in Mexico City in 1880, those of later date being taken from the records of the Department of Encouragement by Pedro Lopez Monroy, a mining engineer, who was commissioned by the Mexican Government in 1884 to write a Memorial of the Mines of Guanajuato which was published by the Government in 1888 as Volume X, of the Annals of the Department of Encouragement, and is a volume of 738 pages devoted, with the exception of the first 68 pages, to the mines and mining interests of Guanajuato.

There are to-day three American banks in Mexico City doing good business.

Lately the American Government has sent much of her silver to the Mexican mints to be coined into Mexican dollars for use in the Philippines, no other coin being so acceptable in that part of the world.

DEMAND FOR AMERICAN GAS COAL IN AUSTRIA.

CONSULAR REPORT.

There is an increasing demand in Austria for a high-grade gas coal. Strange as it may seem, the production of artificial gas is advancing in this country. This is due to two different causes: First, the Auer incandescent gas-burner, an Austrian invention, which is in general use here, has greatly increased the efficiency of gaslight, and, in a measure, re-established the popularity of gas as an illuminant; second, the relentless war which is being waged against the smoke nuisance in many cities has led a large portion of the smaller establishments to employ gas as their motive power. The increased consumption of gas has made the erection of many new works necessary, especially in the larger cities, and has also greatly quickened the interest of gas experts in improved processes of production, as well as in new and more productive kinds of raw material.

In the past, the bulk of the gas coal consumed in Southern Austria has been imported from England. The present price of this coal f. o. b. Trieste is about 19s. (\$4.62) per ton, and the average quantity of gas produced from it is from 29 to 30 cubic meters per quintal, or about 10,500 cubic feet per ton. The total quantity of gas coal consumed in this consular district is probably about 300,000 tons per annum.

In a recent number of a German gas journal, the statement appeared that at a test made in London an American coal had yielded 15,900 cubic feet of gas per ton. Such a coal, if it really exists, would be worth here not less than \$6 a ton.

The United States Consul at Trieste, Mr. Fredk. W. Hossfeld, would be pleased to receive from American coal producers, for distribution among interested parties in his district, analyses of their coals, as well as statements of well-authenticated gas tests, where such tests have been made. The Consul thinks that with properly directed efforts a good market can be established here for superior grades of American gas coal.

A GERMAN COAL TRADING CONCERN.—

The Deutscher Kohlendepot Gesellschaft is the title of a concern which has lately been formed in Hamburg. The shareholders consist of the German Admiralty and all the Government-subsidized steamship companies, and the object is to establish coaling stations on the route to China, to render the German navy of liners independent of British coal merchants. One coaling station has been at work for some time at Algiers, and a second is about to be put in operation at Port Said. It is expected that the new depot will this year deal with 130,000 tons of coal—a total which will be largely increased in 1903, when the North German Lloyd Company, whose coal contracts do not expire till then, will become a shareholder in the Kohlendepot Gesellschaft. It is considered in Germany that the new concern will have a serious effect on the British coal trade in the Far East.

### PRESENT MINING CONDITIONS IN THE TRANSVAAL.

By Our Special Correspondent.

"You can never tell what a day will bring forth" is a true saying, and holds out here, as well as in other parts of the world. The outlook is much brighter than it was when I sent my last letter, more than a month ago, and although the good times have not arrived yet, there is much cause for encouragement.

Were it not for the restrictions and grievances connected with martial law, one would scarcely believe there was any war on at all. Every now and then some wild plot on the part of the foreign element of Johannesburg is brought to light, but after one or two of the leaders are court-martialed and shot we lapse back into a quiet, regular life again.

The "refugees," as the returning Johannesburg population are called, are arriving steadily from the coast, all appearance of a rush, however, being prevented by the military authorities by means of the permit system.

The best informed men here are of opinion that by the middle of February all the necessary laboring population for the mines will be here, and their prediction is that after that time real work will commence in our midst, on account of the thousands of unnecessary people who are determined to get here.

I have been over South Africa a good deal, and it struck me that every man, woman and child I came across was planning to come to Johannesburg, to make a fortune, as soon as the way was opened up. A great many more will come than are needed, for the mining industry cannot get back to its high-water mark, save by slow degrees; nor can big properties be sufficiently opened up to employ a great number of men in a short space of time. I fear the large proportion of these people are fortune seekers, and not the skilled labor that the industry requires.

A prominent member of one of the big relief committees told me that he expected a big strain on their money bags by April or May, so you can see how the wind blows.

Just now, however, there is no scarcity of work, and it is easy to find employment. Were the authorities to throw open the gates to-morrow, however, the white labor would soon exceed the demand.

Of the thousands of immigrants that will come to South Africa the greater proportion will select Johannesburg as their goal. It is in this way, however, that South Africa will become populated, for the excess population that comes to Johannesburg, and finds standing room only, will be forced to other parts of the land. Already the Government is showing praiseworthy efforts to make it possible for numbers of the coming multitude to find employment in agricultural pursuits. No doubt new industries will spring up, but I am sure the gold industry of the Rand, great as it is, cannot support every one coming to the Transvaal. As long as martial law holds sway we do not expect to see any great congestion here.

An arrangement that the returning refugees find rather disagreeable, as well as the mine managers who employ them, is that all males who are British subjects are forced to become members of a military organization, the Rand Rifles. This is a reserve force for the protection of Johannesburg, almost the only protection, in fact, that this place has just now, most of the regular troops being posted elsewhere. Every member of the Rand Rifles must attend a certain number of drills each month, and it is rather annoying, sometimes, when you most want a man for an important job underground, to be reminded that he has to attend drill that afternoon. You are compelled to let him off two hours or so before the usual hour. Fortunately none of the men are fond of the drills, and prefer working to being soldiers. Americans score

here, for they cannot force them to become Rand Riflemen. There are a few American volunteers, however.

I have mentioned in a previous letter the negotiations between the Portuguese and British authorities regarding the supply of Kaffir labor for the Rand.

Had the Portuguese officials been bribed, the thing would have been settled long ago, but our side was determined to be perfectly square in the matter, and so, after a long wait, the papers were at last signed in Delagoa Bay last week. One of the great obstacles to the success of the negotiations was the little recognition that Delagoa Bay has received of late as a shipping centre. The Portuguese have themselves to blame for the small freight traffic for the Transvaal, as they charge nearly as much per ton to carry goods from the port, to Rosina Garcia, the boundary station, as it costs to get freight up from Durban or Cape Town.

There is no question about the superiority of Delagoa Bay as a natural harbor over other South African ports. How long Portugal will be able to hold this important place, it is hard to say. If England decides she ought to have it, Portugal will lose this possession, but as the other British ports, like Durban, Port Elizabeth and Cape Town, are very much opposed to Delagoa Bay ever becoming a British possession, it is probable Delagoa will be in the hands of the Portuguese for a long time to come.

Portuguese East Africa is one of the most densely populated parts of South Africa, and the Kaffirs from that territory are preferred for the mines, for two reasons. On account of the distance to their homes they do not care to take so many trips home as the Zulus and Basutos do, so when they are once comfortably settled on a mine they will remain for months, perhaps years. These Kaffirs are also popular because of their stupidity. A strange reason for popularity.

As you no doubt know, there are thousands of Kaffirs required to work the gold mines, as many as 3,500 being employed on a mine running 200 stamps. These Kaffirs are under the direct charge of a compound manager, generally an Afriander, who has been brought up with the natives and thoroughly understands how to manage them. How are you to punish a Kaffir if he does wrong, as he so often does on the mine? From personal experience I know that the only way to really punish him is to make him suffer physical pain. Imprisonment, to him, is a mere holiday, and no punishment at all. Discharging them from your employ is ridiculous, as he can find work in half an hour at any of the neighboring mines.

The Dutch, who know the Kaffirs so well, generally punished them at the whipping post, the number of stripes administered varying with the heinousness of the crime. To the Kaffir mind these lashes were abhorrent, and the fear of them kept many from crime, I am sure.

I had a Kaffir boy whom I caught stealing gold. At the trial he was in fear and trembling that lashes would be his punishment, but when he was told that he would only be imprisoned for four months, he could hardly contain himself. Six months later I saw him, free once more. He said that he had enjoyed his holiday, and would not mind stealing some more gold, if his punishment would be as light again.

Before this war, the Kaffirs on the mine, if they did wrong, and deserved it, were flogged by the compound manager. Legally he was not supposed to do so, but I do not suppose there was ever a conviction under the Boer Government for such an offence, unless it was a case of cruelty, which seldom happened. The compound managers and others are rather excited over the proclamations recently issued by Lord Milner, making it a crime to hit or flog a native, and requiring every compound manager to have a license, which will be taken away, if seen fit. If a Kaffir does

a misdeed on the mine, the law is to call in a labor inspector, who has the power to fix a fine as high as £5 (\$25), or order the Kaffir to have six months' holiday, that is imprisonment for that time.

Some compound managers have been convicted already of breaking the law, but the companies pay the fines, without any objection, and this is one reason why the Kaffirs from Portuguese territory are in greatest demand. They know nothing about this law, and if they do wrong, take the flogging as a matter of course. The Basutos and Zulus, however, are much wiser, being told by missionaries and others of this glorious proclamation, and if you raise your voice to them be careful you are not "run in" for cruelty. When martial law expires, and we have representative government here, I believe flogging will be reinstated, as the only effectual way of punishing Kaffirs.

There was quite a gala day in town not long ago, on account of the reopening of the Stock Exchange. When it was known that the negotiations were signed there was a very strong tone, and a number of rises in the market. Take it on the whole, the Johannesburg Stock Exchange is a most honorable institution. Unlike most places, many parts of America included, we try to find out the real value of a gold mine, as far as it is possible, and it only needs a little judgment to decide if the quoted price of a share on the Stock Exchange is a fair one for any particular stock. Every one knows which stocks are solid and which are purely speculative. The most business seems to be done in the speculative stocks, which are seldom quiescent for long. One objection to the Stock Exchange here is that you have to buy shares in lots of 100 as a rule, so a man has to save up his earnings for a long time before he can do anything. Many cable to London, if they want small lots of any mining stock. The brokers are reasonable in their charges, and in good times do a rushing business. Most of the miners are great Stock Exchange experts, and are never satisfied until they lose all they have or make a small fortune.

With the signing of the negotiations, the military authorities became very generous, and gave permission for eight or nine mines to start up immediately. On those mines which received permission to start, there has been an unprecedented rush, for to us on the mines it means full pay once more, as soon as the mill commences crushing, and you can understand our eagerness to hear the stamps dropping on the date we are permitted to start. As usual, the only party that has shown a hustling spirit is the Eckstein group, other firms as the Gold Fields of South Africa and the Robinson being rather reluctant to start up under the circumstances.

I fear the authorities were too sanguine over the Kaffirs, for so far only a fifth of the boys that were expected have arrived, so instead of receiving 600 Kaffirs to run 50 stamps, we only had 91 sent to our mine. It was impossible with 210 natives in our compound to start up with the allowed 50 stamps, so we made a beginning with 20 stamps, feeling sure that in a few weeks enough men will be sent out to allow us to run 50 or 60 of our big mill of 200 stamps.

Such a rush as there has been on this mine, I never experienced before. In the first place, we started up on a 12 days' notice. Most of our men were at the coast ports, and had to be brought up. There was no broken rock on the stopes; our air compressors were still undergoing repairs; much of the machinery needed a thorough examination and trial. By working night and day and every day in the week, the manager directed operations so well that we would have commenced with 50 stamps on the day named had the full number of Kaffirs been sent.

Most of the mines are starting up on short notice. Very few of them are working on the contract system as yet, the miners receiving the same wages as formerly, 25 shillings (\$6) per shift for running two rock drills; but as soon as we settle



down somewhat the contract system will be reinstated.

So important is this contract system, in dealing with labor, and so much interest is manifested in it everywhere, that I should very much like to give an account of the system as carried on here, but I have not the space or the time at my disposal just now. I hope to do so at some future date.

Considerable difficulty is experienced on most of the mines on re-starting operations, on account of the very acid state of the ore sent to the mill. In mines where the rock has only been recently broken there is no trouble, but on mines which have had loose stuff lying about the stopes for many months past, and which have big surface dumps of ore fit to work, there is a good deal of worry. Besides the acid, there is organic matter, pieces of chips and iron, grass, and the like. It is most disagreeable stuff to treat, from the sorting floor to the slimes works. The mill foreman on this mine is using as much as 8 per cent of lime, and still the tailings give an acid reaction.

The cyanide managers are also having their troubles. The plants were shut down so hurriedly on the outbreak of hostilities that many of the huge tanks were left full of tailings, some only partially treated, and others untouched. On many of the tanks the cyanide solution had to be left, and it has remained there, exposed to the elements for over two years. Most of the mines, therefore, start up with 500 to 800 tons of solution, carrying from one to two pennyweights of gold. The problem is what to do with this terrible looking stuff. When it first comes from the tanks it gives a pale blue scum, due to Prussian blue; then you get a variety of colors, due to the different hydrates present. On passing it through the box enough froth and gas are generated to lift the zinc out of the bottom of the box. It cannot be precipitated as it is, therefore, and a large sump is set aside for its reception. On some properties they consider that it is too big a problem to get the gold from the solution, so they throw it away.

I have recommended that our old solution be dealt with in the following manner: In the first place it is well to get the gold out, if it can be done easily and cheaply. Treat the solution, therefore, with enough zinc chloride, or sodium sulphide to bring down the gold in a fine grayish powder; then allow this solution to filter through some coarse concentrates, when the gold will be deposited on the sand. This sand you can use for fluxing, in the cyanide works smelter, and thus get your gold. The next thing is to get rid of your solution, which is difficult to do, on account of its poisonous character. To make it innocuous pour in H<sub>2</sub>SO<sub>4</sub>, until the solution gives an acid reaction, then you can safely let it run into any of your dams.

Some have made the foolish mistake of bringing this old liquid up to strength by adding cyanide. Better to start off with pure, clean water, with the required cyanide of potassium added to it, than to use this old, foul complicated stuff to make up your solutions. Your cyanide solutions will become foul enough in time without your making matters worse by starting off with a complicated mixture.

The tailings left in the tanks we find in a very acid state. They have packed down so tightly that it is difficult to get the neutralizing solution to soak through the compact mass. We find that the best thing to do is to discharge from the top to the bottom tanks, adding the required amount of lime as we lower the tailings, and then treat with cyanide of potash in the lower tank. It is very essential that these tailings be a little alkaline. As an indicator of alkalinity we use a 10-gram solution of phenolphthalein in 1000 c. c. of water.

What I have said above applies to the slimes plant as well, but as a rule the slimes assay about 3 pennyweights, and we find it is not worth while

to treat the slimes left in the tanks, so we have thrown them away.

A great deal of sampling has been done on most of the mines during the last few months, especially on those mines which were worked by the Boers, in order to determine the value of the ore in sight. The enclosed photograph will give an idea of the number of samples taken, for these "boys" have to make many trips from the sample house to the shafts, to bring in all the samples.

Some of the business houses in town seem to be doing fairly well, especially Fraser & Chalmers. To Americans this firm is not as interesting, perhaps, as it was, for they can no longer point to it with pride as an American firm, for the Fraser & Chalmers of the present time in Johannesburg is an entirely English concern, which makes all the mining machinery for this country, in Erith, England.

Most of the employees in its branch here, however, are Americans, and it looks as if this firm is to play a bigger part here in the future than it did in the past.

PIG IRON PRODUCTION IN 1901.

In our last week's issue we published the full statistics of pig iron production in the United States in 1901, as compiled by the American Iron and Steel Association. We supplement this here by a few details taken from the report. A full statement of production, classified according to fuel used, is as follows:

	1900.		1901.	
	Tons.	Perct.	Tons.	Perct.
Anthracite and coke....	1,677,048	12.2	1,712,527	10.8
Bituminous and coke....	11,727,712	85.0	13,782,386	86.8
Charcoal.....	339,874	2.5	360,147	2.3
Charcoal and coke.....	44,608	0.3	23,294	0.1
Totals.....	13,789,242	100.0	15,878,354	100.0

Nearly all the so-called anthracite furnaces use some proportion of coke mixed with the coal.

The total output of pig iron in the United States has been as follows for 10 years past:

1892.....	9,157,000	1897.....	9,652,680
1893.....	7,124,502	1898.....	11,773,934
1894.....	6,657,388	1899.....	13,620,703
1895.....	9,446,308	1900.....	13,789,242
1896.....	8,623,127	1901.....	15,878,354

This statement shows in a very condensed form the fluctuations of the iron trade during the period covered.

The production of pig iron by States for three years has been as follows:

States.	1899.	1900.	1901.
Massachusetts.....	2,476	3,310	3,386
Connecticut.....	10,129	10,233	8,442
New York.....	264,346	292,827	283,662
New Jersey.....	127,598	170,262	155,746
Pennsylvania.....	6,558,878	6,365,935	7,343,257
Maryland.....	234,477	290,073	303,186
Virginia.....	365,491	490,617	448,662
North Carolina & Georgia.	17,835	28,984	27,333
Alabama.....	1,083,905	1,184,337	1,225,212
Texas.....	5,803	10,150	2,273
West Virginia.....	187,853	166,758	166,597
Kentucky.....	119,019	71,562	68,462
Tennessee.....	346,166	362,190	337,139
Ohio.....	2,375,212	2,470,911	3,326,425
Illinois.....	1,442,012	1,363,383	1,596,830
Michigan.....	134,443	163,712	170,762
Wisconsin & Minnesota..	203,175	184,794	207,551
Missouri, Colo. & Wash..	138,880	159,204	203,409
Totals.....	13,620,703	13,789,242	15,878,354

The four leading States in 1901 were Pennsylvania, which made 46.2 per cent of all the iron produced; Ohio, 20.9 per cent; Illinois, 10.1 per cent, and Alabama, 7.7 per cent. These four States furnished 84.9 per cent of the total. Allegheny County in Pennsylvania alone made 2,897,366 tons of pig iron in 1901.

MANGANESE ORE EXPORTS FROM SPAIN.—Exports of manganese ore from the province of Huelva, Spain, in 1901, are reported by the *Revista Minera* at 91,672 metric tons, against 129,916 tons in 1900; a decrease of 38,244 tons, or 29.4 per cent. Of the imports in 1901 there were 918 tons to Great Britain; 2,361 tons to France; 2,442 tons to Germany; and 85,951 tons to Belgium and Luxemburg.

THE UNIVERSITY OF TEXAS MINERAL SURVEY.

By WILLIAM B. PHILLIPS.

A *Report of Progress* has just gone to press and will be issued within the next two weeks. It deals with the work of the Survey during the past year and contains a full account of the sulphur deposits in the northeastern part of El Paso County and also some observations on the quicksilver deposits in the southwestern part of Brewster country. It will be remembered that the Survey was organized in May, 1901, under the provisions of an act of the Legislature authorizing and empowering the board of regents of the University of Texas to make a mineral survey of the public lands in the State. The first work of the Survey was the preparation and publication of a bulletin on petroleum, which appeared about the first of September, 1901. The demand for this publication has been so great that only about 300 copies are left from the edition of 4,000 copies. It is the only publication of the kind that has yet appeared. After this bulletin was issued the Survey began the examination of certain public lands in the Trans-Pecos region, in the counties of Pecos, Reeves, El Paso, Presidio and Brewster. A report on the sulphur area in El Paso County was made, giving sections, analyses, maps, etc. Up to this time the only report that has been published concerning these interesting deposits is that of Dr. Eugene A. Smith, director of the Alabama Geological Survey, who made a trip into the region in 1895 and published an account of the deposits in *Science*, May 1, 1896. It is thought that the first account of them was given by Prof. Wm. P. Blake, 1853-54, as geologists to the Pope Expedition for the survey of a railroad route from the Mississippi River to the Pacific Ocean. He gave an analysis of a sample of sulphur-bearing earth found on the Delaware Creek, El Paso County, and spoke of the occurrence of sulphur in that district. In the forthcoming report of the University of Texas Mineral Survey Dr. Smith's article is republished in full, together with the special report of Mr. E. M. Skeats, prepared for the Survey.

Only a brief mention of the Brewster County quicksilver ores will appear in the report for the reason that the Survey will devote considerable time this year to the study of that region. In co-operation with the United States Geological Survey an accurate map of all that part of Brewster County will be prepared on a scale of 4 miles to 1 inch and with contour intervals of 50 feet. The area to be mapped includes the quicksilver belt and the coal-field of the Agua Fria and that of the Chisos Mountains. The active assistance of the United States Geological Survey is of the greatest benefit to the State Survey, for it means that skilled topographers will have the matter in hand and that all triangulation and topographic work will be executed by the field parties of the United States Survey. The principal object of the University of Texas Mineral Survey is to examine into the existence of the useful minerals on the public lands. Its purpose is more economic than geologic. It is not, strictly speaking, a geological survey, but a mineral survey, and it aims to assist the General Land Office of Texas in the classification of the public domain, of which there still remain about 18,000,000 acres.

THE DOMBROWA COLLIERIES, RUSSIA.—The London *Colliery Guardian* says that during the working year ending June 30, 1901, the Dombrowa collieries put out 472,804 tons, against 455,889 tons during the previous working year, most of the coal being contributed by the Paris-Chaper group. Trials have been made of electrical coal-cutters, both English and American; but sufficient time has not yet elapsed to permit of judging whether they are likely to give economical results.

## TIN MINING IN NEW SOUTH WALES.

BY JOHN PLUMMER.

Tin deposits are scattered widely throughout Australia, there being over 120 recognized stanniferous localities in New South Wales alone; but comparatively few are worked to any considerable extent, limited water supply and absence of cheap and speedy means of communication with the coast, forming at present—apart from fluctuations in market prices—the leading difficulties encountered. Although in New South Wales the existence of tin was discovered as far back as 1851, it was not until over 20 years later that mining operations were commenced. In 1872, according to Prof. David, of Sydney University, tinstone was accidentally discovered while searching for gemstones near Inverell, in the northern part of the State. Mixed with a number of sapphires and other gems in the gravels of the creek was a heavy black mineral, in water-worn grains which, on assay, proved to be oxide of tin. The discovery becoming known, a Sydney company took up some ground in the vicinity, and then commenced to rush to what are now known as the New England tin-fields. Strangely enough, the stream tin, as the black mineral is called, had long been familiar, under the name of "black sand," to alluvial gold miners in the district, where its weight, rendering it difficult of removal from the sluice-boxes, had caused it to be regarded as worse than a nuisance. In some places the stockmen, ignorant of the real character of the sand, used it for cleaning their bits.

Native tin has been found in the State, but, as in other parts of the world, it is of rare occurrence. The same may be said of stannite, or tin pyrites, although it is plentiful, with galena, zinc-blende, and arsenical pyrites, in the Borah Creek silver lode, near Inverell. The common ore of tin is the oxide, otherwise known as cassiterite or tinstone, found in New South Wales in several forms, and of various colors.

At Vegetable Creek, the leading tin-field in the State, between 1872 and 1885, 15,000 tons of cassiterite are said to have been extracted from a shallow alluvial deposit, within a distance of a little over 5 miles from its source downwards. The total area of ground worked was about 150 acres, which produced 15,000 tons of stream tin, or, at the average rate of 100 tons per acre, or 50 pounds of cassiterite per cubic yard, allowing the mean depth of the wash-dirt to be 2 feet 6 inches. The depth of stripping (over-lying soil) varied from 6 inches to 9 feet. At Catarrh Creek about 1,000 tons of stream tin were obtained from the shallow alluvials within a distance of about 1 mile. The width of the deposit varied from 100 to 450 feet, and the depth of sinking to the granite bed rock was from 10 to 14 feet. The Vegetable Creek workings are situated in what, during early Tertiary times, formed the main drainage channel of this part of the State. In portions of its course there were two distinct flows of lava, an older and a newer, each covering a bed of stanniferous wash-dirt. Up to 1886 the produce of these latter was 6,000 tons of stream tin in a distance of 2½ miles in all. At one place an area of 5½ acres of gravel, having an average thickness of three feet, yielded 2,000 tons of tin-ore. In the far western portion of the State, at Euriowie and Poolamacca, about 50 miles to the north of Broken Hill, tin ore occurs under conditions differing materially from those of the other New South Wales tin-fields. A considerable area of ground was pegged out for mining purposes when these deposits were first discovered, but probably not more than 100 tons of dressed ore were despatched from the field before it was abandoned. The scarcity of water for the necessary concentration processes, and the distance (several hundred miles) which separates the district, which is rich in minerals, from the seaboard, are the chief reasons which led to the cessation of mining operations, which are certain to be resumed when conditions are more favorable.

It is, however, as pointed out by Mr. E. F. Pittman, in his work on "The Mineral Resources of New South Wales," in the northern portion of the State that the principal stanniferous deposits occur. From near Tamworth, tin-bearing rocks extend north-

wards, with some intermission, up to the Queensland border. The mean width of this area is about 30 miles, and within it are the leading New South Wales tin-fields.

The largest export of tin raised in the State was 9,125 tons, value \$3,957,850, in 1883; and the greatest value \$4,010,613 (for 8,670 tons), in the previous year. The quantity exported in 1900 was 916 tons 7 cwt., value \$580,474, making the total quantity exported since the opening of the New South Wales tin fields, in 1872, 135,078 tons, value \$52,076,342. This does not include the produce of other States.

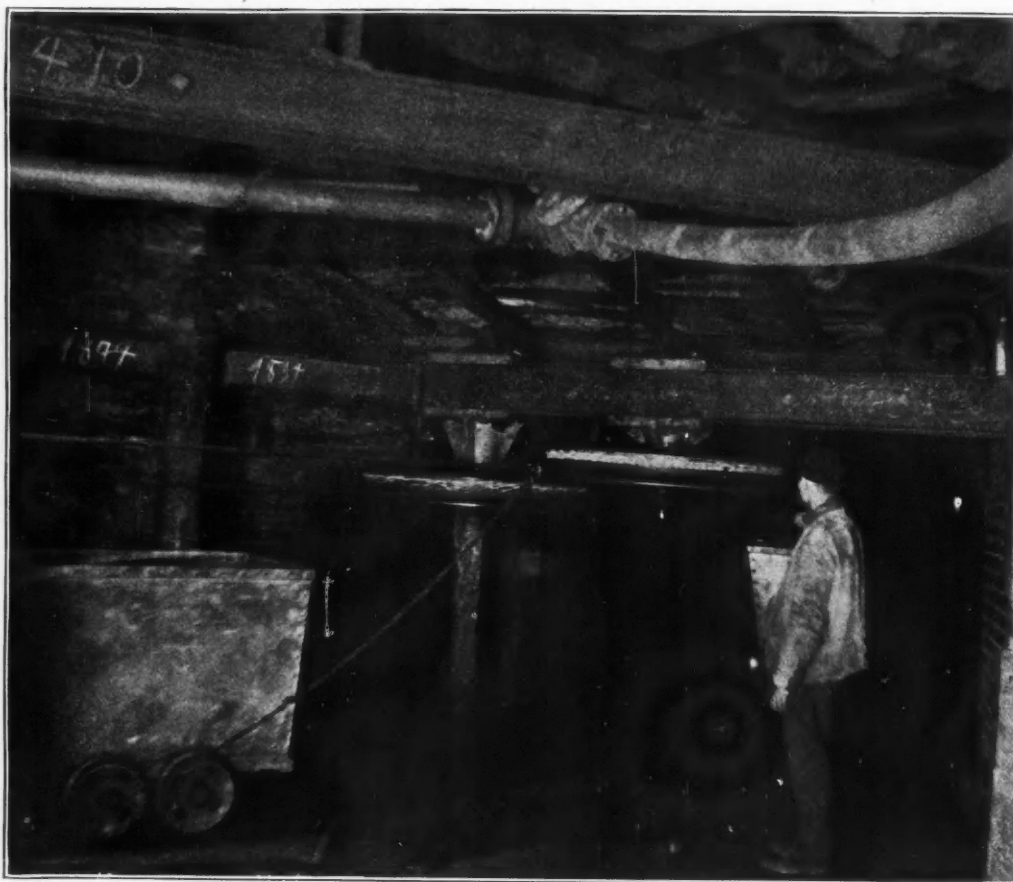
A "HANDY WAY" OF GETTING RID OF RUBBISH.—The New Zealand *Mines Record* for December says: "While making an official inspection of the Murray Creek Coal Mine, Reefton, on October 30, the inspector of mines found an extensive fire of shaly rubbish, which was burning in the centre of the mine-workings. On making strict inquiry into the cause and nature of the fire, the workman who

## THE HIBERNIA MINING COMPANY OF HERNE, WESTPHALIA.

The Bergwerks-Gesellschaft Hibernia is one of the largest coal producers of Germany, and some account of its mines will serve to show the state of development attained by a representative German coal-mining company.

The Hibernia Company was founded in 1873 for the purpose of taking over the property near Gelsenkirchen, Dortmund District, now known as the Hibernia Mine, embracing 2,066,280 square meters, and the Shamrock Mine and coke-ovens in the vicinity of Herne, with a territory of 6,538,610 square meters. These holdings were extended at different times and include the Wilhelmine Victoria, the Schlägel & Eisen, the Vereinigtes Deutschland, the Reichskanzler and the Deutscher Kronprinz properties, so that at present the company owns 64,842,430 square meters of mining rights in the Dortmund District.

The deposits are opened by 18 deep shafts and work is being carried on at eight different localities, giving employment to more than 12,000 men. Be-



MECHANICAL UNDERGROUND HAULAGE, SHAMROCK MINE, NEAR DORTMUND, WESTPHALIA.

was getting out the coal stated that he had kindled it three days previous to the inspector's visit, with the view of simplifying the work of sluicing the rubbish into the creek. This man was apparently ignorant of the risk to which he subjected the property, so he was promptly ordered to connect the hose-pipe and turn the sluice-water on to the fire. These orders were immediately carried out under the inspector's supervision, and every indication of the fire was speedily extinguished, the debris being sluiced into the creek, leaving the sluice-water in full flow, and the workman was instructed to wash away every particle of the remaining loose ground. In a memorandum attached to the report he states that the lessee (Mr. Lewis Betts) was away at the time, and his workman pointed with apparent pride to the fire as 'a handy method for getting rid of the rubbish.' . . . The inspector has served notice upon the lessee, directing attention to the dangerous condition in which his coal-mine had been found, as well as to the damage caused to the adjoining property."

sides producing coal for the market the company manufactures coke and the by-products from the coke-ovens, including tar, ammonium sulphate and benzol.

At the Shamrock Mine, which is one of the leading properties of the company, the machinery and apparatus installed include two hoisting-engines of 700-h. p. each; two coal-working plants; two coke-plants with 120 Otto-Hoffman ovens, of which 60 are operated for recovery of by-products; a plant for the manufacture of ammonium sulphate by the Otto-Hoffman process, and one for making benzol by the Brunck system; two Geisler ventilators having a capacity of 12,000 cubic meters of air per minute, four Humboldt compressors; two dynamos of 550 and 650 amperes each for lighting the underground workings; three duplex pumps and 20 boilers with an aggregate heating-surface of 1,900 square meters. The coal-washers have a capacity of 150 to 220 tons per hour. Provision is made for prompt action in case of accident in the mines, and the ventilation



can be reversed when necessary. There are four shafts, the deepest of which is 582 meters down. The underground workings extend 3,000 meters along the strike and 1,800 meters on the dip. Two shafts are used for hoisting, and a third for pumping. The fourth is the ventilating shaft, which is rectangular in section, with an area of 9.62 square meters. It supplies about 7,200 cubic meters of air per minute to the working faces.

During the year 1900 there were 2,694 men employed at this colliery, and 941,136 tons of coal were mined. The coke ovens made 155,188 tons of coke; while the by-products included 3,318 tons tar, 1,313 tons sulphate of ammonia and 693 tons of benzol.

The capital of the Hibernia Company is 39,400,000 marks (\$9,377,200), of which 1,600,000 marks are debentures bearing 4 per cent interest, the remaining 37,800,000 marks being stock, on which dividends amounting to 15 per cent were paid in 1900. The company contributes each year a considerable sum to a miners' benefit fund, which insures the employees in case of accident and sickness.

1901. The number of workmen engaged in collieries increased by 1,324, or 7.2 per cent., attaining nearly 20,000, including 13,145 underground. Wages rose appreciably, the mean daily wage of an underground hand having been 5.21 francs (\$1), against 4.91 francs (\$0.94) in 1899; but the mean individual yield continued to decrease—that of the underground hand from 314 to 300 tons per annum, or 1.039 to 0.993 ton per diem. The consumption of explosives increased by more than 11 tons, while black powder is being replaced by safety explosives, especially grisoutine; and, owing to the large number of preparatory workings, the consumption of dynamite greatly increased. The quantity of water raised for every ton of coal was 2.9 cubic meters, and the quantity of gob material packed was 50.65 per cent (against 52.46 per cent in 1899) of the coal extracted.

**ELECTROLYTIC SEPARATION OF TIN.**—The *Electrical World and Engineer* says that a curious parallelism is presented between the well-known Hoepfner process for the extraction of copper from

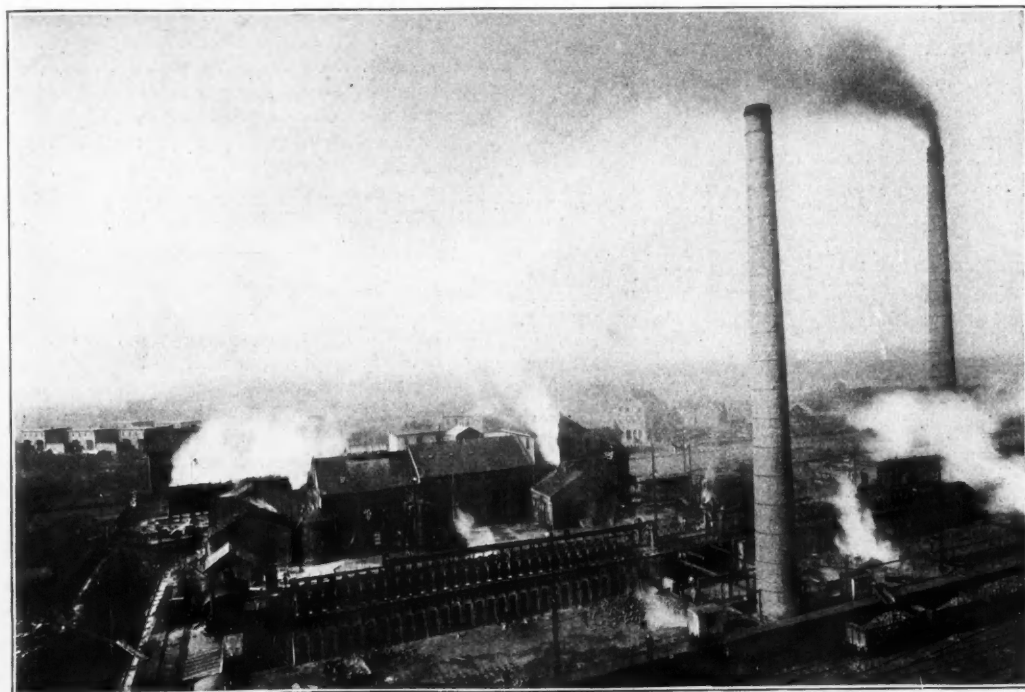
#### THE UNITED STATES MINERAL EXPORT TRADE IN 1901.

The total value of the more important domestic mineral products and their manufactures exported from the United States in 1901, as shown in the table below, was \$188,637,536, against \$229,512,689 in 1900. The decrease of \$40,875,153 or 18 per cent has been due in part to the industrial depression in Germany, France, Great Britain and other leading European countries and which succeeded the trade activity that marked the years 1899 and 1900. The adverse conditions of European trade, however, were not entirely responsible for the decreased exports. The Boxer troubles in China and the war in South Africa affected our exports to a considerable extent. In addition to these was the unprecedented home demand which largely curtailed supplies available for export trade. The exports of pig iron and of iron and steel manufacturers in 1901 were more than \$12,000,000 less than the preceding year. This was entirely due to the great activity in these lines throughout the United States. An interesting item in the statement is the increase of 50 per cent in the exports of tin plate. The manufacture of tin plate in the United States is an industry developed in the last ten years of the 19th century. Prior to 1891 practically all of the tin plate used in this country was imported. We are now making in the neighborhood of 400,000 long tons a year and are beginning an export trade in that product.

The principal decrease in our mineral exports in 1901 was in copper ingots. About 56 per cent of the total decrease in value of the exports was represented by this factor alone, while copper, iron and steel were together responsible for 80 per cent of the decrease.

The exports of refined copper in 1901 show a decrease, amounting to 143,723,923 lbs., or 42½ per cent as compared with 1900, and 52,576,503 lbs., or 21.3 per cent from 1899. The following comparison of 1901 and 1900 exports shows to what countries we attribute the fall: Germany, 37,487,180 lbs., against 67,348,848 lbs. in 1900; a decrease of 44.4 per cent; France, 34,607,042 lbs., against 67,725,989 lbs., or 49 per cent; other Europe, 83,314,105 lbs., against 137,447,152 lbs., or 39.5 per cent; United Kingdom, 36,819,100 lbs., against 63,522,445 lbs., or 42 per cent; British North America, 1,377,955 lbs., against 1,616,778 lbs., or 14.8 per cent; Mexico, 217,437 lbs., against 296,684 lbs., or 36 per cent; other countries, 427,009 lbs., against 15,855 lbs. in 1900. We may add that the total exports in 1901, amounting to 194,249,828 lbs., as compiled by the Bureau of Statistics of the Treasury Department, were equivalent to 32.7 per cent of our production, whereas in 1900 the exports, 337,973,751 lbs., were equal to 56.1 per cent of the output. It is interesting to note that, although there is a significant difference in the proportion of exports to production in 1901 as compared with the previous year, our output in 1901 shows a decrease of only 1.4 per cent. In the exports of copper ore we note an increase of 9,606 tons, or 49 per cent as compared with 1900, and of 15,866 tons, or 81 per cent over 1899. This increase was due chiefly to the heavier shipments to Great Britain, where the ore is smelted and occasionally re-exported as refined copper.

The exports of iron ore, and manufactured iron and steel, exclusive of machinery, were valued at \$23,864,087, against \$36,271,859 in 1900; showing a decrease of \$12,407,772, or 34 per cent. Concerning the exports of steel rails, which amounted in 1901 to 318,055 tons, against 356,245 tons in 1900, it may be noted that this decrease of about 11 per cent was mainly in the shipments to British North America (65,797 tons in 1901, against 125,931 tons in 1900, and 92,039 tons in 1899). Our second largest customer was South America, which increased its purchases over 60 per cent, receiving in 1901 a total of 52,569 tons, as against 20,462 tons in 1900. Another country to show a marked increase is Mexico, which imported 53,456 tons in 1901, or nearly 35 per cent more than in 1900. Railroad building has been active in the countries named



COKE OVENS AT THE SHAMROCK MINE, WESTPHALIA DISTRICT.

The accompanying illustrations are from photographs furnished by courtesy of the Hibernia Company. They represent a view of the coke-ovens at the Shamrock Colliery; and a view showing the method of underground haulage in use in the Shamrock Mine.

#### COAL MINES OF THE LOIRE, FRANCE.

The recent report of M. Tausin, chief inspector of the department of La Loire, France, as abstracted by the *London Colliery Guardian*, says that the department contains 76 mine concessions, including 64 of coal and 8 of anthracite. Of the 50 collieries actively worked, 26 belong to the Saint-Etienne and 24 to the Rive-de-Gier group; and they produced together 3,946,998 tons last year, against 3,809,948 tons in 1899, showing an increase of 3.6 per cent., and constituting the highest record yet attained in the Loire, although nearly approached by the figure for 1873. Owing to the exceptional state of the market the outputs of some of the collieries increased to an unexpected extent; and the *Mine aux Mineurs*, at Monthieux, which was very well managed, put out 78,474 tons, or 22,827 tons more than in 1899. The production of coke and briquettes increased last year, and would have increased still more but for a deficiency of small coal. The mean sale price of coal increased by 2.78 francs (\$0.53) attaining 18.05 francs (\$3.47); and this price was maintained during the first months of

its ores and compounds, and a method just patented to Paul Bergsøe, of Copenhagen, for the electrolytic recovery of tin from scrap and waste alloys. The Hoepfner process, it will be recalled, depends upon the varying valence of copper, and consists in bringing a salt of copper in its higher state of oxidation into contact with the ore, whereupon copper passes into solution and the solvent is reduced from the cupric to the cuprous condition; this solution is then electrolyzed with insoluble anodes to deposit one-half of its metal, restoring the remainder to its original valence and reconstituting the solvent. Bergsøe reacts upon tin-bearing materials with stannic chloride, and subjects the stannous salt formed to electrolytic treatment as above, restoring its valence and solvent power, and recovering an amount of metal equivalent to that dissolved. Both methods are simple, and indeed identical, in theory. The Hoepfner process has encountered in practice the very serious obstacle of a low-reaction velocity—a solvent action so slow as to render its application to the most commonly occurring ores of copper, the sulphides, of doubtful practicability. From this defect the new process is free, for the stannic salts are energetic solvents. The successful treatment of tin scrap, however, has proven in the past a difficult problem, not only on account of its very low tin content, but because of the tendency of the iron to pass with the tin into solution. As applied to this purpose, therefore, the industrial value of the new process is yet to be demonstrated.

above, and already large contracts for rails have been booked for 1902 shipment. Of the balance of our steel rail exports in 1901 Europe received 37,888 tons, as against 31,530 tons in 1900, and 21,150 tons in 1899. Japan has received only 17,364 tons, against 44,654 tons in 1900; a decrease of 27,290 tons, or 61 per cent. Iron ore exports in 1901 show an improvement over the two previous years, and the same may be said of bar iron and wire.

Our machinery trade, though large, shows a falling off in all but the electrical line, which recorded an increase of 6 per cent over 1900. Our exports of metal working machinery in 1901 were about one-half what they were in 1900, owing to the decreased demand for the manufactured articles by European consumers.

There was a heavy decrease in the exports of spelter in 1901, the total being equivalent to only 15 per cent of the exports of the previous year, and about 50 per cent of those of 1899. This is attributed to the depression in European industrial

rock were also exported to France, Italy, Great Britain and other countries.

There has been an increased buying of anthracite coal in Canada, but bituminous shows a falling off of 14 per cent from 1900, owing mainly to the small exports to British North America. Of the total coal exports in 1901 British North America received 5,080,963 tons or about 69 per cent. Small amounts were sent to France (55,076 tons) and Germany (37,845 tons), principally bituminous coal. Only 569 tons were sent to Great Britain, as against 4,412 tons in 1900. Italy and other European countries, excepting those already mentioned, received 315,530 tons, against 450,269 tons in 1900, and 33,708 tons in 1899. Mexico showed imports of 551,448 tons, or a decrease of 17 per cent as compared with 1900. The West Indies took 735,389 tons, against 761,075 tons in 1900, the decrease of 25,690 tons being due to the smaller shipments to Cuba. South America imported 277,800 tons in 1901, against 214,126 tons in 1900, and 88,733 tons in 1899, Brazil receiving

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

DUTY ON METAL CLIPPINGS.—Clippings from Dutch metal, fit only for manufacture, are free of duty under paragraph 505, tariff act of 1897, and are not dutiable under paragraph 193 as manufactures of metal. Local appraisers are in no sense classifying officers, their recommendations to collectors as to the character of goods being purely advisory.—Appeal of T. Reissner from Collector of Customs at New York; Board of General Appraisers.

RIGHT TO A NON-SUIT IN CONTEST FOR A MINE.—The laws of the United States (Revised Statutes, Section 2,326) provides that if, in adverse proceedings, the title to the ground is not established in either party, the jury shall so find, and judgments shall be entered accordingly; and the law of Colorado (Code, Section 166) declares that a judgment of non-suit may be entered on motion of defendant when plaintiff fails to prove sufficient to go to the jury. It was by the court, on appeal, that where, in an action to prevent the issuance of a patent to defendant's mine, because it included a mine located by plaintiff, the evidence was not sufficient to show that plaintiff's mine was located on unappropriated territory, and defendant did not ask for a judgment or verdict, it was proper on his motion to enter judgment of non-suit.—Kirk v. Meldrum (65 Pacific Reporter, 633); Supreme Court of Colorado.

RE-LOCATIONS AND CONTESTED CLAIMS.—Where one owning three contiguous claims did no work on one claim, but did sufficient on the other two to have protected all, the question whether the work so done was for the benefit of the group of claims and tended to develop the one not worked was for the jury. This party produced deeds for such claims from the persons who had located the mines more than six years before, and showed its actual possession for the last two years before the trial, and the court on appeal held that a verdict that he and his predecessors had been in possession for six years was justified as against one claiming the mines as abandoned. In such case prima facie evidence is sufficient to justify the verdict, as against one who knowing of the location relocated the mine on the claim that the mine had been abandoned and no work done thereon during the preceding year. Where on re-locating a well-known mine, notices of claim containing explicit descriptions of monuments and boundaries are posted and filed, and six years afterwards a sufficient number of monuments are found, so that by following the descriptions in the notices the boundaries are traced, a finding that the claims had been marked so that the boundaries could be readily traced is justified.—Yreka Mining & Milling Company v. Knight (65 Pacific Reporter, 1901); Supreme Court of California.

RISKS ASSUMED BY MINER.—One who was employed in a mine and engaged in blasting rock by the use of a machine drill and dynamite, was injured by the premature explosion of a charge which he was tamping into a hole drilled for the purpose, the tamping bar having been furnished by the operator and used at the time consisted of a piece of gas pipe, with the end plugged with clay or wood. Such tools were largely used in other mines, as were also bars made of wood, and some of solid iron. There was some evidence tending to show that the wooden bars were the least dangerous. The miner was 24 years of age, intelligent and well educated, and with considerable experience, having been employed in different mines at the same kind of work for more than two years, and in this particular mine for three months, during all of which time he had used the same instrument without accident. He knew the properties of dynamite, that it would explode by concussion, and was as well quali-

U. S. EXPORTS OF MINERAL PRODUCTS AND MANUFACTURES IN 1900 AND 1901.

Articles.	1900.		1901.		Changes, 1901.	
	Quantity	Value.	Quantity	Value.	Quantity	Value.
Bricks, building and fire.....		\$723,037		\$541,589		\$181,448
Cement, bbls.....	100,406	225,306	373,934	679,296	I. 273,534	I. 453,990
Acids.....		166,576		205,400		I. 38,824
Copper sulphate, lbs.....	43,630,621	2,057,079	47,729,547	2,251,436	I. 4,098,926	I. 194,357
Lime, acetate, lbs.....	52,126,121	910,647	58,340,982	1,017,130	I. 6,214,861	I. 106,483
Coal, anthracite, tons.....	1,654,610	7,092,489	1,993,907	8,937,147	I. 338,697	I. 1,844,658
Coal, bituminous, tons.....	6,262,909	14,431,590	5,390,086	13,085,763	D. 872,723	D. 1,345,827
Coke, tons.....	376,999	1,358,968	384,330	1,561,898	I. 7,331	I. 202,930
Copper ore, tons.....	10,007	1,332,829	19,613	2,536,549	I. 9,606	I. 1,203,720
Copper, ingots, etc., and old, lbs.....	337,973,751	55,285,047	194,249,828	31,692,563	D. 143,723,923	D. 23,592,484
Copper manufactures.....		2,257,563		1,842,336		D. 415,229
Phosphate, crude, tons.....	619,995	5,217,506	729,633	5,841,495	I. 109,638	I. 623,935
Iron ore, tons.....	51,460	154,756	64,703	163,465	I. 13,243	I. 8,709
Pig iron, tons.....	286,687	4,654,582	81,178	1,259,499	D. 205,509	D. 3,395,083
Iron and steel scrap, tons.....	49,328	862,239	14,199	221,060	D. 35,129	D. 641,179
Bar iron, lbs.....	29,789,499	558,576	39,664,870	674,671	I. 9,875,371	I. 116,095
Steel bars and rods, lbs.....	206,120,153	3,488,110	79,656,864	1,435,475	D. 126,463,289	D. 2,052,635
Iron and steel billets, etc, tons.....	107,385	2,915,371	28,614	708,887	D. 78,771	D. 2,206,484
Iron rails, tons.....	5,374	119,206	901	32,357	D. 4,473	D. 86,849
Steel rails, tons.....	356,245	10,895,416	318,053	8,628,781	D. 38,190	D. 2,266,635
Iron sheets, lbs.....	20,902,367	600,600	15,466,168	452,695	D. 5,436,199	D. 147,955
Steel sheets, lbs.....	101,995,225	1,638,478	53,588,154	959,471	D. 48,407,071	D. 679,007
Tin plates, etc., lbs.....	612,241	31,082	983,383	51,614	I. 371,142	I. 20,532
Structural iron and steel, tons.....	67,714	3,570,769	54,005	3,031,861	D. 13,709	D. 538,908
Iron and steel wire, tons.....	174,751,042	4,604,047	197,651,789	4,805,638	I. 22,900,747	I. 201,591
Machinery, electrical.....		5,286,224		5,623,442		I. 337,218
Machinery, metal working.....		6,210,594		3,003,871		D. 3,206,723
Machinery, pumping.....		2,750,312		2,024,937		D. 725,375
Steam engines and boilers.....		7,222,059		6,435,351		D. 786,708
Nails, cut, lbs.....	25,005,308	626,497	20,837,973	450,331	D. 4,167,335	D. 176,166
Nails, wire, lbs.....	61,385,843	1,552,130	42,050,602	888,282	D. 19,335,141	D. 663,848
Lead, pig and old, lbs.....	1,993,773	88,664	4,787,107	214,842	I. 2,793,334	I. 126,178
Lime, barrels.....	61,762	66,954	37,328	42,431	D. 24,434	D. 24,523
Roofing slate.....		848,320		1,011,183		I. 162,863
Nickel, lbs.....	5,869,906	1,382,727	5,869,655	1,521,291	D. 251	I. 138,564
Mineral Oils: Crude, gals.....	138,161,173	7,340,749	127,008,002	6,037,544	D. 11,153,171	D. 1,303,205
Naphtha, gals.....	18,570,488	1,681,201	21,684,698	1,741,543	I. 3,114,210	I. 60,342
Illuminating oil, gals.....	739,163,464	54,692,872	827,222,048	53,490,713	I. 88,058,584	D. 102,159
Lubricating oil, gals.....	71,211,353	9,933,548	75,291,424	10,260,103	I. 4,080,071	I. 326,555
Residuum, barrels.....	470,238	845,337	657,056	1,254,983	I. 186,818	I. 409,646
Quicksilver, lbs.....	778,191	425,812	858,228	475,609	I. 80,037	I. 49,787
Salt, lbs.....	15,021,861	65,410	18,865,247	86,414	I. 3,843,386	I. 21,004
Zinc ore, tons.....	37,555	1,133,663	39,425	1,167,684	I. 1,870	I. 34,024
Zinc, pigs, etc., lbs.....	44,802,577	2,217,693	6,770,221	288,906	D. 38,032,356	D. 1,928,787
Total value.....		\$229,512,689		\$188,637,536		D. \$40,875,153

centers. At the same time, however, our foreign trade in zinc ore has increased 5 per cent from 1900, and 39 per cent from 1899, as a result of the agreement with Belgian smelters.

Exports of domestic lead were better than 1900 by about 60 per cent, our best customers being England, Germany, Austria and Italy.

Quicksilver trade recovered somewhat, but it is still far below 1899. Leading purchasers were Mexico and Central America while occasional lots were shipped to Korea, Japan and British Columbia.

Mineral oils, excepting crude, all show an increased quantity exported last year. The total quantity was equal to 1,062,750,306 gals., as against 975,123,476 gals. in 1900; or an advance of 8 per cent, chiefly in illuminating oil. Of the 1901 exports 924,198,170 gals., or about 87 per cent, was refined oil, of which Great Britain received 216,682,499 gals., as against 194,671,321 gals in 1900; Germany, 150,018,779 gals., against 145,983,313 gals.; the Chinese Empire, 54,806,845 gals., against 24,537,219 gals., and Japan, 60,326,611 gals., against 53,941,984 gals. in 1900. The crude oil went chiefly to France. The value of mineral oils exported in 1901 was less than in 1900.

Phosphate rock exports have increased 15 per cent, principally in high-grade Florida rock, which found its largest customers among the superphosphate manufacturers of Germany. Quantities of Tennessee and South Carolina and Florida pebble

the most of this. The increase in coke exports is equal to 7,331 tons, our best buyers being Mexico and Canada.

IRON MAKING IN COLOMBIA.—Three blast furnaces have been built in Colombia, South America. One, the Ferreria de Samaca, in the Department of Boyaca, built a blast furnace to use coke as fuel and imported a good deal of machinery, but as the members were not experienced in iron working they gave up when they met their first difficulties and the furnace is not running. There is good coal and ore in the vicinity. Another company is called the Ferreria de Pacho, and the works are situated 12 leagues from Bogota. The furnace built here was to use charcoal, and a rolling mill and foundry were built in connection with it. Ores are good in the neighborhood, but work is suspended at present. The third plant is the only one which is making iron at present in Colombia. The company is the Ferreria de la Pradera. It is situated 8 leagues from Bogota, and consists of a coke blast furnace capable of producing from 30 to 40 tons of iron per day, several puddling furnaces, steam hammers, and trains of rolls for turning out rails, plates and light shapes. A machine shop is also connected with the works, and it is stated to be the intention later on to engage in the manufacture of steel, as the ores are considered to be adapted to the production of steel.



fied as the operator to determine whether the bars in use were more dangerous than others used in other mines. The court held that, an intelligent man, with full knowledge of the character and quality of an instrument furnished him for use, and all of the facts and physical laws which render its use dangerous, after having voluntarily accepted employment in a hazardous business, involving the use of such instruments, cannot be heard to say that he did not know it was dangerous, but he assumes the risk of injury from its use, as a hazard of the employment.—King v. Morgan (109 Federal Reporter 446); United States Circuit Court of Appeals, Colorado.

ABSTRACTS OF OFFICIAL REPORTS.

Lehigh Valley Coal Company.

This company operates a large property in the anthracite region of Pennsylvania. It is owned by the Lehigh Valley Railroad Company. The report for the year ending November 30, 1901, gives a statement of earnings and expenses which may be summed up as follows:

Coal sales, anthracite.....	\$21,276,522
Coal sales, bituminous.....	101,687
Commissions, rents, royalties, etc.....	432,374
<b>Total receipts.....</b>	<b>\$21,810,583</b>
Mining and purchase of coal.....	\$13,675,715
Less value of coal added to stock.....	1,185,051
<b>Balance.....</b>	<b>\$12,490,664</b>
Transportation of coal.....	8,719,846
Selling and other expenses.....	645,295
<b>Total expenses.....</b>	<b>\$21,855,805</b>
Deficit from operation.....	\$45,222
Interest and improvements.....	446,355
<b>Total deficit for the year.....</b>	<b>\$491,577</b>

The report says: "The results of the operation of the Lehigh Valley Coal Company show a loss of \$491,577, as compared with \$869,847 in the previous fiscal year, a decrease of \$378,271. The average price realized for all sizes of coal was in excess of that for the previous year, though the percentage of sales of sizes above pea, which produce the largest revenue, decreased from 62.52 per cent to 60.76 per cent. There was produced during 1901, from the collieries operated by the Lehigh Valley Coal Company and its tenants, and from collieries operated by tenants of companies in which the Lehigh Valley is interested through ownership of stock, a tonnage aggregating 6,673,137 tons of all sizes, an increase of 1,726,972 tons, as compared with the figures of 1900. The sources from which this tonnage was derived during 1901 are shown in the table below, together with the tonnage derived from the same sources during the fiscal year 1900:

	1900.	1901.	Changes.
Lehigh Valley Coal Co.....	2,833,136	3,758,581	I. 925,445
Tenants of L. V. Coal Co.....	1,323,884	1,477,468	I. 153,584
Other tenants.....	789,144	1,437,088	I. 647,944
<b>Totals.....</b>	<b>4,946,164</b>	<b>6,673,137</b>	<b>I. 1,726,973</b>

"The tonnage for 1901, with the exception of 289,705 tons, was transported to market over the Lehigh Valley system. The capacity of the collieries operated by the Lehigh Valley Coal Company in 1901 averaged about 19,646 tons per day, as compared with 18,642 tons during 1900. The cost per ton of coal mined and purchased was \$1.0892, as compared with \$1.8462 in the previous year; an increase of \$0.1430. The cost of mining at the collieries operated by the Lehigh Valley Coal Company includes in addition to the regular mining expenses, all charges to general expenses, royalty, sinking fund, insurance, taxes, depreciation and improvement account.

"During the year 1901 there was expended at the anthracite mines \$372,709 for colliery improvement work, which amount, in addition to the depreciation charge of 5 cents per ton, amounting to \$187,929 for reduction of the old improvement account, was charged directly to cost of mining. The sinking fund, under the terms of the mortgage of 1892, has been increased during the year by \$63,409, and now amounts to \$577,216. This amount has been paid to the trustees under the

mortgage, for the purchase and cancellation of bonds. Under the existing arrangements the Lehigh Valley Coal Company is compelled to depend upon the Lehigh Valley Railroad Company for working capital to carry on its operations. The suspension of mining during the period of the strike last year and the sale of the greater portion of coal in stock enabled the Coal Company to repay to the Railroad Company a large proportion of the amount advanced by the latter company for this purpose. The uninterrupted continuance of operations during the fiscal year just closed restored normal conditions, necessitating advances by the Railroad Company of \$1,000,000, which amount is more than represented by the increased tonnage and value of the coal in stock, as compared with November 30 last year."

The report of the Lehigh Valley Railroad Company shows that its earnings from coal transportation in 1901 were \$11,099,167, or 55 per cent of its total receipts. The report does not separate the coal statistics from general freight. Taking all together the average haul per ton was 192.16 miles, and the average receipt per ton-mile 0.542 cent. The total coal moved over the railroad was as follows, in long tons:

	Anthracite.	Bituminous.	Total.
Revenue coal, Lehigh Valley.....	8,524,210	1,081,231	9,605,441
Hauled by other companies over L. V. tracks.....	2,100,683	94,666	2,195,349
Coal for company's use.....	570,096	806,713	1,376,809
<b>Total.....</b>	<b>11,194,989</b>	<b>1,982,610</b>	<b>13,177,599</b>

Of the anthracite carried 2,288,268 tons were delivered to local points on the company's lines; 2,363,469 tons were hauled to tidewater; 1,305,523 tons were carried to Buffalo for the Lake trade; and the balance was delivered to connecting lines.

Vindicator Consolidated Gold-Mining Company, Colorado.

This company owns a property in the Cripple Creek District. The capital stock is \$1,500,000, and the company holds \$400,000 of this in the treasury. The report is for the year ending December 30, 1901.

The development work done during the year was as follows: Sinking, 767 feet on three shafts; drifting, 4,948 feet; cross-cutting, 1,755 feet; raises, 1,197 feet; winzes, 195 feet; total, 8,862 feet. The ore mined and the receipts and expenses are given below:

	Total.	Per ton.
Tons ore mined.....	16,711	
Assay value.....	\$715,179	\$42.80
Freight and treatment.....	151,579	9.07
<b>Gross proceeds.....</b>	<b>\$563,600</b>	<b>\$33.73</b>
Interest, etc.....	1,898	0.11
<b>Total.....</b>	<b>\$565,498</b>	<b>\$33.84</b>
Working expenses.....	\$274,751	\$16.44
General expenses.....	23,717	1.42
Paid lessees.....	50,103	3.00
Equipment and buildings.....	20,940	1.25
<b>Total expenses.....</b>	<b>\$369,511</b>	<b>\$22.11</b>
<b>Surplus.....</b>	<b>\$195,987</b>	<b>\$11.73</b>

From this surplus the company paid \$170,500—15.5 per cent—in dividends, leaving a balance of \$25,487. To this is to be added \$78,330 brought forward from 1900 and \$64,750 received from sale of the stock held by the company in the Union Gold Extraction Company, making a total of \$168,567 surplus at the close of the year.

The directors' report says: "We had a serious accident to our hoisting engine on shaft No. 1 on the night of December 1, which wrecked the reel and brake engine and damaged the building; but fortunately only slightly injured one man, the engineer, whose carelessness or ignorance caused the wreck. This accident caused a complete shut-down of No. 1 shaft for December, causing an actual loss of about \$5,000, besides curtailing our production for the year about \$20,000. This latter is not an actual loss, for the ore is still in the mine, but it would have added materially to the showing for the year. The machinery and buildings have been fully repaired, and these, our main

workings, were started up again January 6, and everything is now working in good order.

"There are only two lessees now working on the property, on shafts No. 7 and No. 11. Shaft No. 7 was abandoned a year ago, but some additional prospecting resulted in opening up a new ore body, and that is now being worked. The company will abandon work on shaft No. 2 during the year, as we will have all the ore worked out above the 600-ft. level, and to work deeper would necessitate heavier machinery and a pumping plant, and we believe it will be more economical to do all of our work through shaft No. 1, and we are now extending our drifts from shaft No. 1 with that end in view. We shall immediately start a cross-cut southwest from the 1,200-ft. level to cut the veins coming into our ground from the Christmas and Golden Cycle territory. There are four of these veins that are shipping ore in large quantities, and we feel confident of finding these veins and ore shoots within our territory. We shall also run another long cross-cut to the northeast to prospect a new territory in this direction. We do not expect to sink the shaft any farther this year, but to develop the property thoroughly to the extreme limits thereof laterally. We shall need very little in the way of new machinery or buildings during the coming year.

"We have charged off \$19,644, being 20 per cent, to profit and loss from the permanent equipment account to cover loss and deterioration for the year, as the property is now very fully equipped.

"The Union Gold Extraction Company sold their plant to the United States Reduction Refining Company in June, and we have received \$64,750 for this company's interest, which cost us \$50,000. We at the same time made contracts for the treatment of our ore until January 1, 1903, at the old rates. The present rates will average fully \$2 per ton higher than our contract. The majority of the stockholders of the Union Gold Extraction Company voted to sell the mill, and our board of directors could not very well oppose the sale with our small interest.

"During the year 1900 we shipped 26,810 tons of ore, which returned assay values of \$32.65 per ton, and net smelter returns of \$22.41 per ton. During 1901 we shipped 16,711 tons, which returned assay values of \$42.80 per ton, and net smelter returns of \$33.73. This comparative statement shows a very satisfactory increase in the value per ton of ore shipped.

"The board of directors at their meeting January 1 declared the regular quarterly dividend of 3 cents per share, and an extra one of 5 cents, making a total of 8 cents that will be sent with this annual statement. The board of directors felt that the condition of the property and the treasury was such that we did not require a large reserve, and that the stockholders were entitled to the use of the money."

New York & Honduras Rosario Mining Company.

The property of this company is represented by \$1,500,000 stock, on which dividends amounting to \$300,000 were paid during the year ending November 30, 1901, which is covered by its report. The receipts during the year were from bullion, \$780,760; interest, etc., \$6,110; total, \$786,870. The expenses were: General supplies, \$159,555; expenses in Honduras, \$354,939; freight and insurance, \$18,468; general expenses, \$18,142; total, \$551,104, leaving a profit balance of \$235,766 for the year.

The directors' report says: "The dividends paid have amounted to \$300,000, being 20 per cent on the capital stock. The total dividends paid to date have been \$1,695,000. The credit of your company has been fully maintained, both here and in Honduras. At the mine the ore in sight is estimated at 22,500 tons of high-grade milling ore, with excellent prospects for increase in the future. In underground workings 8,505 feet have been driven, as against 7,204 ft. in 1900.

"Perhaps the most important acquisition which we have obtained in the past year consists in the final perfection of the titles to the very large additions to your property purchased in late years. These purchases have multiplied, many times over, the original mine which you possessed, as you now own about 20 square miles of territory, more or less mineralized, with many well defined veins, not a few of which are of known value. These properties were obtained at a small percentage of their worth, owing to the fact that the mountainous nature of the territory prevented their profitable exploitation, except through the underground working in your mine. It is manifest that the connection between these veins and your works requires both time and money, but we can assure you that no stone is being left unturned to bring about so desirable an end at as early a moment as proper economy permits. In order to be the more sure of success, a consulting engineer of high repute has been engaged to proceed to Honduras, and there confer with your manager, with the view not only of accomplishing this but also to instruct us in the profitable employment of modern labor-saving appliances, which our abundance of water power would enable us to utilize.

"The desirability of increasing our capital stock, which our improved properties abundantly justify, and the listing of the same on the New York Stock Exchange, have engaged our serious consideration, on both of which points the stockholders may shortly be called upon to express their opinion."

The report of Manager W. Gierlings says: "The new ore-sorting plant at the Rosario (650-level) Pateo has never received yet the full share of the work which will fall upon it as soon as Uprise No. 52, from this to the lower 300-ft. level, shall be finished. Therefore, only trial runs have been made with the trommel sorting plant from the use of which considerable economic results are anticipated. The plant is being driven by electricity, a small motor having been arranged so as to work on the trolley line circuit. It is notable that, throughout the newer parts of the mine, the gold values in the ores are on the increase, a feature which has the appearances of proving a permanent one.

"If no notable advance has been made in economies, in regard to the saving of values and to the losses of chemicals in the mill treatment, still no ground has been lost, although the latter might have occurred when ores from two, three or even more different veins had to be sent to the mill in a mixture. Endeavors are being made to remedy this as fast as possible. The addition to the 35-stamp mill is completed as far as the retaining walls, buildings and the foundations for locating the machinery are concerned, and with the machinery already on the ground and fitted for being set up, no more than a few weeks' time will be required for getting the additional 10 stamps with the corresponding pan and settler capacity into running order whenever the mine shall be in condition for turning out larger amounts of ore.

"The electrical department has grown much during the year, the improvements comprising not alone the trolley plant, the mechanism for the running of the trommel plant and other minor devices, but also the installation of another circuit so that the mill and the adjoining buildings can instantaneously be lighted by incandescent lamps whenever the arc-light plant does get out of order. Of outdoor improvements, both at the upper and lower works there has been a considerable amount accomplished, the largest piece of work having been the spacious pateo at the entrance to the lower 650-ft. level, while at the same time due attention was given to the keeping in order of the wagon road to Tegucigalpa as well as of the numerous local roads leading to the charcoal and timber supply camps in the immediate vicinity.

"The reports, just submitted by our engineers in regard to the quantities of milling ore available in the mine, place the amount at not more than 22,500 tons, with a milling value of not less than 80 ounces in silver and \$8 in gold per ton."

#### BOOKS RECEIVED.

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

*South Australia. Handbook of Mining.* Prepared by the Department of Mines. Adelaide, S. A.; Government Printer. Pages, 16; with maps.

*Furnace Draft. Its Production by Mechanical Methods.* By William Wallace Christie. New York; The D. Van Nostrand Company. Pages, 44; illustrated. Price, 50 cents.

*Proceedings of the Lake Superior Mining Institute at its Seventh Annual Meeting, March, 1901.* A. J. Yungbluth, Secretary. Houghton, Mich.; published by the Institute. Pages, 120; illustrated.

*New South Wales. Annual Report of the Department of Mines for the Year 1900.* D. C. Lachlan, Under Secretary for Mines, Sydney, N. S. W.; Government Printer. Pages, 220; illustrated.

*Western Australia. Report of the Department of Mines for the Year 1900.* H. S. King, Under Secretary for Mines. Perth, W. A.; Government Printer. Pages, 328; illustrated.

*Der Thalsperrenbau nebst einer Beschreibung Auefuhrter Thalsperren.* By P. Ziegler. Berlin; Germany; A. Seydel. Pages, 324; with 214 illustrations. Price (in New York) \$5.75.

#### NEW PUBLICATIONS.

*Eastern Peru and Bolivia.* By William C. Agle. Seattle, Washington; Homer M. Hill Publishing Company. Pages, 46; with map. Price, 50 cents.

This is a loosely written and somewhat disjointed account of wanderings in Bolivia and Eastern Peru. The writer describes what he has seen; but he is evidently not a trained observer, and his work has very little value. It may draw some attention to the region, but the accounts given are too general and indefinite to impress mining men or investors seriously.

*General Map of the Anthracite Coal Fields of Pennsylvania and Adjoining Counties.* Revised January, 1902, by the Bureau of Anthracite Coal Statistics. Philadelphia; Alder & Ruley. Price, mounted, \$3.50; unmounted, \$2.50.

This map is a revision of the general map of the anthracite coal-fields of Pennsylvania which was published by the State Geological Survey in 1886 under the direction of Dr. Charles A. Ashburner, geologist in charge. The revised edition brings all of the mine locations up to date, each mine being designated by a number, with a corresponding list giving the names of the mines in each district. The list of mines is divided into the Northern Coal-field, the Eastern Middle Coal-field, the Western Middle Coal-field, and the Southern Coal-field. The map shows excellent workmanship throughout, and will make a handsome and interesting addition to the wall decorations of the offices of persons interested in the anthracite coal trade. Copies may be ordered through the ENGINEERING AND MINING JOURNAL.

*The Chemical and Physical Examination of Portland Cement.* By Richard K. Meade, Easton, Pa.; the Chemical Publishing Company. Pages, 184; illustrated. Price, \$1.

There have been papers almost without end writ-

ten on the testing of cement, and published in technical journals and the proceedings of engineering societies. The present book is a fairly successful attempt to sum up in one volume the various methods of analysis and physical testing. It is written largely for the benefit of young engineers and chemists, as well as students, and therefore goes into a good deal of detail. The introduction treats generally of the nature and composition of portland cement and the current theories of its hardening. The author then takes up analytical methods, treating successively of the analysis of cement generally, the analysis of cement mixtures, the analyses of limestone and clay. The following part relates to physical tests, covering the accepted methods of testing cement for the various qualities which it should possess. The concluding part treats of the detection of adulteration in portland cement; while an appendix contains a number of tables useful for the analyst.

The author has drawn freely upon various authorities and has made a book which will be useful to engineers as well as students. Opinions differ very much as to tests of cement and their value; but all admit that such tests are necessary, and a description of the methods employed, given in a convenient form, cannot fail to be useful.

*New South Wales. Annual Report of the Department of Mines for 1900.* D. C. McLachlan, Under Secretary for Mines. Sydney, N. S. W.; Government Printer. Pages 220; illustrated.

The New South Wales reports on mines have been as a rule carefully prepared and valuable summaries of the mining industry of the State, and the present one is no exception. In addition to the statistical summary it contains a great deal of information as to progress made in mining, new mining methods adopted, examinations made of mining districts and of mineral deposits; and also as to legislation and the inspection of mines. In addition to the report of the secretary there are reports from the mine inspectors, the government geologist, the analyst, the mineralogist and other officers of the department. The total mineral output of the State in 1900 was valued at £6,750,820, the leading items being £2,513,874 for the lead and silver ores of the Broken Hill District; £1,668,911 for gold; £1,194,521 for coal, and £428,036 for copper. Among the other items we find tin, zinc, cobalt, chrome ore, opals, antimony and a variety of lesser mineral products, besides building stones and clay. All of these are referred to in the report, and many of them are treated at length. The report is illustrated by maps and by a number of half-tone engravings showing mines and plants.

*Victoria. Annual Report of the Secretary for Mines and Water Supply for the Year 1900.* J. Travis, Acting Secretary. Melbourne, Victoria; Public Printer. Pages, 136; with maps and illustrations.

This report contains, in the first place, a statistical report, showing the output of gold and of other metals and minerals in Victoria during the year 1900. This is supplemented by an account of the work done by the Mines Department to aid mining and prospecting during the year; by reports on the work of the mine inspectors and on improvements made in mines and mills, and by a number of short articles, drawn from various sources, on improvements in mining methods and machinery. There are also several special reports on different districts in the State.

Among the questions to which special attention was paid during the year was the ventilation of mines. A close inspection was made of the condition of the air in a number of the deeper mines, and a stricter enforcement of the laws on this subject was undertaken. Another point to which much attention was given was the extent to which dredging operations could be allowed without interfering with agricultural interests. This was a point which in many cases required careful consideration. The dredging work is rapidly extending.



Water supply is a very important question in Victoria, especially in view of the drought which has now lasted for several years throughout a large part of Australia. Much attention has been given to the possible increase of supplies, to the storage and conservation of water and to economy in its use. All of this has a very direct bearing upon the interests of the mining industry.

#### CORRESPONDENCE.

We invite correspondence upon matters of interest to the industries of mining and metallurgy. Communications should invariably be accompanied with the name and address of the writer. Initials only will be published when so requested.

Letters should be addressed to the MANAGING EDITOR. We do not hold ourselves responsible for the opinions expressed by correspondents.

#### *The Gem Jessie Group at Butte.*

Sir: I read with interest the report on the Gem Jessie group of mines in the columns of the ENGINEERING AND MINING JOURNAL, January 18. Everything in this group and its neighborhood is looking better than ever; they have struck large bodies of high grade copper ore in many of the neighboring and adjoining properties. I am told very reliably that Mr. Heinze on the Cora, which is directly west of the Gem Jessie, has the largest bodies of high grade copper ore in the Butte District at 1,050 feet depth. In the Jessie they are hoisting ore daily in a very high quality, and this only in running their drifts and developing the property, as they are not stopping or trying to extract ore. In the Tuolumne, which joins the Jessie on the south and east and the Sioux Chief, which joins the Tuolumne on the south, they have a good body of copper ore at a depth of 450 feet; this is also true of several other claims in that district, and it looks now as though it was going to be the producing district of the Butte camp, not alone as to the percentage of copper up there, but it all goes high in silver, much more so than the copper taken from any other part of this district.

Of course the depression in the copper market would affect the situation in New York, but it had no effect here with people who were posted upon the real value and merit of the properties, knowing that it was only a question of time when they would be operated at a profit, and that the present conditions were due entirely to stock manipulation, and to no fault of the properties, all of which have permanent values and great merit. They can produce copper here as cheap as they can anywhere, and cheaper than they can in the Lake District, owing to the gold and silver values which are contained in these ores. L.

Butte, Mont., Jan. 29, 1902.

#### *Smelter's Deductions from Copper Weights.*

Sir: For the benefit of some who are not familiar with the present customs, methods and contract specifications, by means of which sales of the copper contents of ores, matte, or bullion are effected to the respective smelters and refiners who purchase such commodities, a short resumé of the subject is necessary to a proper understanding of the subject.

When sales of copper are made in the principal cities of this country—and the larger sales commonly are made in such centers—it is particularly specified as between buyer and seller that the latter shall be represented at the receiving point of the shipment by his own personal representative, who is usually some public weigher and assayer who makes this his sole profession and business. When the carload or shipload arrives, both representatives are duly notified, and the buyer of the shipment pays the freight, unless the contrary is specified, which is rare. The seals of the car or hold are broken in the presence of samplers representing both laboratories having the assaying in charge. These sampling men oversee the workers unloading the shipment, and usually take the sample in the case of ore or matte by an arbitrary selection of some par-

ticular bag, shovelfull, barrow load or bucket load, as for instance every sixth or tenth or any number agreed upon. Bars or anodes are bored with a machine drill in specified places in lots of five or more, and the borings carefully saved and subsequently divided. The selected large sample of ore or matte is quartered down as it is gradually reduced by hand hammers until finally a pound or less is bucked down to the agreed mesh.

The final sample of ore, matte, or bullion is divided into three parts, one of which is retained by each sampler, and the third is reserved for the umpire or referee in case of dispute. In order to avoid any impeachment of the integrity of the sample, the sample bags or bottles are jointly filled by both samplers and sealed with sealing wax. The wax seals must show the imprint of the seals of both representatives, bearing the date of sampling.

If the subsequent copper assays of the representatives show a difference of more than 0.2 per cent it is customary to send the third portion of the sample to the umpire, likewise a public assayer, whose analysis is final as determining the percentage value of the shipment, unless very far removed from the average already determined; and the party whose analysis is farthest from the umpire assay, has to bear the expense of the reference. The fact that references are very rare in proportion to the agreements, demonstrates the perfection of the system as well as the integrity of our public assayers.

The settlement sheets of the smelters and refiners show the identification marks of the shipment, the gross tare and net weight; the amount in pounds and percentage deducted for moisture if any, all in shipshape business fashion. But immediately following this frank exposition appears the apparently harmless and fair deduction of 1.3 per cent for the difference between wet and dry copper assay. This is insistently deducted before the pounds of copper present are calculated, unless previous agreement to the contrary has been made.

Various refreshing but unenlightening reasons are given by smelters and refiners for this deduction; one says, "this charge of deduction has always been made for the difference between the modern electrolytic copper assay and the obsolete English oxide of copper determination;" another states, "the deduction is for loss of weight in transportation; still another (honest gentleman) "the deduction is for our losses in refining."

If there were no refining or smelting charges made this deduction and more as well would be unquestionably fair, but as both parties are restricted to the electrolytic copper assay, as the net weights are commonly determined in the purchaser's own works, as moisture is deducted for any loss in weight after the shipment has been stored for a time, and finally as the presence of any foreign matter or debris is practically impossible in the case of the shipment of bars or anodes or bags of matte, the basis for defence of this reduction is reduced to the possible losses from addition to the net weight of ore or matte shipped in bulk. If shipments were carelessly received by smelters or refiners from any one unknown to them, where deceit and dishonest additions to the shipment might be the practice, this 1.3 per cent might be a fair protection. But such is not the case.

One discovers that some sellers blessed with more courage or more of the necessary "filthy lucre" than others, have compelled a reduction of this charge to a flat 1 per cent; and that others by paying merely the refining charges and assuming the responsibility for the subsequent sale of the copper contents, escape this reduction in values altogether. Indeed the big shippers have nothing to do with this charge; it is intended for the instruction of the ignorant.

This custom is wholly justifiable to the lover of antiques. It is nearly if not quite as old as the copper smelting and refining business and fully as obsolete as the former brick furnaces. It was instituted in the days when Swansea, Wales was in its prime as the copper headquarters of the world. Copper ores and some low grade mattes would be un-

loaded from the holds of sailing ships and laid out on the floor of the public warehouse, little lots of a few tons each, loaded with the refuse of the holes, soaked in bilge water. The determinative assays claimed for each pile being known, bidding for each pile would begin, and this deduction was always made for the difference between the analysis of the ore pile, weighed wet, or after drying. Sometimes the shipper got his freight paid for, and a very few got a little more. This deduction gradually grew into the custom of to-day, excepting that in the old days there was no pretence about it, nothing to deceive or confuse the poor miner, who is generally eaten up body, soul, and shipment too, after he has paid his penalties for silica, lead, or zinc.

One could not complain of smelting or refining charges openly and honestly insisted upon, but that the language and explanation of the meaning of this charge or deduction could be so universally ambiguous, is a curious commentary on the power of the smelters and refiners and the proverbial carelessness of the miner or small shipper.

JOHN JEWETT.

NEW YORK, Jan. 29, 1902.

#### *The Removal of Boiler Scale.*

Sir: One of the largest items of waste in connection with the operation of boilers is the formation of scale on the tubes of the boiler. The formation of this scale is slow and seldom perceptible, but as it accumulates the fireman can observe that his daily consumption of fuel gradually increases, and in cases where this formation is neglected, that stage is reached when it is difficult for the fireman to feed enough coal to his boilers to produce the volume of steam necessary for operating the plant. This results in crowding the boilers, which in time results in blistering the crown sheet and in burning out the tubes. One frequently hears the remark that "those boilers don't steam nearly as readily as they formerly did," and again it is said that "those boilers are using much more coal than formerly," and the cause is ascribed to the fact that possibly there is a larger consumption of steam. The engineer of the plant may have a suspicion of the trouble, but the manager usually ascribes it to the fact that the boilers are getting old. In many cases no thought is ever given to the scale formation. As a matter of fact there are many managers who have never heard of the existence of such a substance, but when it is explained that this scale which forms on the tubes of boilers is almost as perfect a non-conductor of heat as a similar lining of asbestos, any practical man will understand what it means to attempt to transmit heat through that substance for the purpose of generating steam, and the advantages to be derived through the removal of the scale and in keeping it off the tubes. A 20 per cent saving in the annual fuel consumption in any boiler room means a reduction in the cost of the previous quantity of coal consumed of 40c. to 60c. per ton. From this it is very easy to calculate the immense amount of waste that arises through this source in any plant in the course of a year.

Again, no boiler can possibly be in good condition that has a heavy accumulation of scale on its tubes. Apparently it might be so, but it is certainly strained, and if the scale is not removed the boiler will rapidly deteriorate. The effect of scale on the tubes is to keep the water from coming in contact with the tube, causing the molecules of the steel on the side next to the fire to expand, and as a matter of course burn off, thus causing the tube to grow thin as it is frequently re-expanded. This also will bring about one or more of the following four conditions, namely, sagging of the tubes, swelling, splitting at the weld, or leaking where the tube goes through the boiler head. None of these conditions becomes apparent until the boiler reaches the dangerous state, and frequently even the most careful examination fails to reveal any of these defects.

The only practical method of removing the scale, once formed, is by means of some mechanical appliance. Many of these appliances can be found, which, with more or less success, are capable of removing the scale from water-tube boilers, but so far as the writer knows there is only one device that will remove this scale from return tubular boilers, that is, where the scale is on the outside of the tubes. The device above referred to will not only remove the scale from return tubular boilers, but from water-tube boilers also, and it is equally efficacious in removing the soot from the outside of water-tube boilers. The device also serves as an inspector to determine the condition of the boilers, and it will disclose defects long before such defects could be discovered by any other known means.

It should be remembered that there is really no way of seeing the exact condition of a tubular boiler. Most tubular boilers have two man-holes each, one at the top and one at the bottom of the boiler, thus the first layer of tubes on the top and bottom are generally kept clean, because the engineer or his assistant can go inside and reach these tubes with his hammer. Not so with all the tubes inside the boiler and between the top and bottom rows. These tubes cannot be reached, nor can they be seen, so it is impossible to tell their condition except by means of some mechanical contrivance.

In this respect it might be interesting to note the results obtained by one of the leading boiler insurance companies during one month's inspections in the course of the past year. The official report states that during the month in question 20,105 boilers were visited. The whole number of defects reported in these boilers reached 15,890, or 79 per cent, of which 1,063, or 6.1 per cent were dangerous. Of the nature of the defects 3,136, or about 20 per cent, were due to incrustation and scale, of which 74 were dangerous; 2,251 to serious leakage around tube ends, of which 258 were dangerous. These two causes alone account for nearly 34 per cent of the total number of defects, and of those defects which were considered dangerous, 31 per cent.

The food for thought furnished in these statements will provide for an indefinite number of meals, and it is not surprising that the subject is being taken up intelligently by those who have had the matter brought to their attention, and any device that will eradicate even a fair percentage of these evils is worth serious consideration.

This letter is not intended to advertise any particular device intended for this purpose, but that there is an excellent device for eradicating this evil can be ascertained by making inquiries of any of the large steam-producing plants in this country, and the writer will cheerfully communicate such information upon application.

If any corporation producing steam power can reduce the expenses of its boiler room even 10 per cent it will find a much larger margin of profit in its product. That this saving can be produced is beyond question.

C. S. DAVIS.

Buffalo, N. Y., Feb. 1, 1902.

### QUESTIONS AND ANSWERS

(Queries should relate to matters within our special province, such as mining, metallurgy, chemistry, geology, etc.; preference will be given to topics which seem to be of interest to others besides the inquirer. We cannot give professional advice, which should be obtained from a consulting expert, or 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.)

**Platinum in South Africa.**—Can you inform me if there are any known platinum mines in the Transvaal, South Africa?—G. A.

**Answer.**—So far as we know there are no mines in South Africa which produce platinum on a commercial scale. The present chief source of the metal is Russia.

**Uses for Mica.**—Is there a steady market for mica? Is it an article necessary to the electrical manufacturing companies? Where is the best mica found, and to what other uses besides electrical purposes is it put? Will you please give the addresses of the companies dealing in mica; also the addresses of companies handling shears and punches used in trimming and otherwise preparing mica for use.—A. E. B.

**Answer.**—The demand for mica in the United States is considerably in excess of the domestic product, a large amount being imported from India and Canada. North Carolina produces a superior quality of white mica, which, however, is not as well adapted for electrical uses as the amber mica which is largely imported from Canada. Mica is used to a considerable extent in stove manufacture, for lamp chimneys and in a variety of ways as a heat and electrical insulator. Ground mica is used for lubricators and for making wall papers. New Hampshire also produces considerable quantities of mica of good quality, and some is also produced in the Rocky Mountain States, particularly New Mexico and South Dakota. Messrs. Gold & Watson, of Boston, Mass.; Eugene Munsell & Co., 104 John street, New York, and the Palermo Mica Co., of Peck Slip, New York City, are large buyers of this mineral product, as are also the General Electric Company, of Schenectady, N. Y., and the Westinghouse Manufacturing Company, Pittsburg, Pa. For the manufacturers of machinery for the preparation of mica, you are referred to the advertising columns of the ENGINEERING AND MINING JOURNAL.

**Tin in Bolivia.**—Can you tell me anything about the tin deposits of Bolivia? How much tin is mined in that country?—J. D. R.

**Answer.**—The tin from Bolivia nearly all goes to Great Britain, usually in the form of black tin, which has to be refined before selling. The production is increasing. The imports of Bolivian tin into Great Britain in 1901 were 9,670 long tons, against 6,965 tons in 1900 and 5,100 tons in 1899. The *Mineral Industry*, Volume IX, says: "Tin ore is mined in Bolivia in the departments of Oruro, Potosi, La Paz and Cochabamba. The department of Oruro is much the most important, containing within its borders 25 mines out of a total of 37 for the entire country. The largest mine is at Huanuni, and it is also the most favorably situated as regards transportation. Owing to the lack of capital and of facilities for transport the industry is but little developed, and it is believed that the product of Bolivia could be doubled easily under more favorable conditions."

**Prices of Manganese Ores.**—I understand that the production of manganese ores is very limited in quantity, quality and mines; that there are practically no reserves of the mineral in the mines of Cuba and Brazil, and it is, therefore, an unstable and uncertain production. Also, that these mines are controlled by the United Steel Corporation, the practical consumers of the mineral, aside from which there is little or no market for manganese ores, and that future manganese supply is a serious problem for the steel companies to solve, the consumption being greater than the production, with increasing consumption and decreasing production. If this be true, there should be an increasing market value for ores, and it also appears that the producers and owners of manganese mines are in a position to dictate price of manganese ores instead of selling the same at market price or quotation dictated by the Steel Corporation. The price on a 50 per cent man-

gane ore I understand is 30 cents a unit, or \$15 per ton. What is 60 per cent ore worth per ton? I have an ore with analysis as follows: Average 40 per cent manganese in oxide, 10 per cent iron oxide, 12 to 15 per cent lime-spar, and 3 to 5 per cent silica. This can be concentrated by elimination of lime-spar up to 55 to 65 per cent manganese, but as the lime is a valuable ingredient, it would best be shipped without concentration. What is this ore worth per ton at New York (or user's market)? Will thank you to publish answer and give information on points mentioned.—F. G. K.

**Answer.**—Some idea of the consumption of manganese ores in the United States may be obtained from the statistics of production and imports. The domestic output of manganese ores in the United States in 1900 was 11,771 long tons, valued at \$100,289. Our imports amounted to 256,252 long tons, worth \$2,042,361 at shipment ports. Consumption has increased rapidly in the last few years. We used in 1900 more than double the consumption in 1897 and more than three times that of 1895. The principal producing countries are France, Germany, Russia, Chile and the British East Indies. The prices paid by the leading consumers for their manganese ores is determined according to a certain schedule which is based on ores containing not more than 8 per cent of silica and 0.1 per cent of phosphorus. Deductions are made of 15 cents per ton for each 1 per cent of SiO<sub>2</sub> in excess of 8 per cent, and of 1 cent per unit of manganese for each 0.02 per cent P over 0.1 per cent. The schedule of prices which ruled in 1900 was about as follows:

Content in Mn. Per Cent.	Price per Unit. Mn. Cents.	Fl. Cents.
Over 49.....	29	6
46 to 49.....	28	6
43 to 46.....	28	5
40 to 43.....	26	5
37 to 40.....	25	5
34 to 37.....	24	5
31 to 34.....	23	4
28 to 31.....	21	4

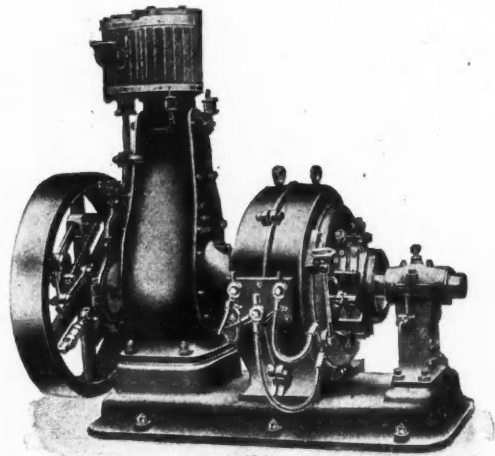
At this rate 60 per cent now on would be worth \$17.40 outside of the iron value, provided it is within the limits for SiO<sub>2</sub> and P. Ore of the analysis given by you would be worth \$10.40 for manganese. From this it would appear that it would pay to concentrate before shipping. The prices given are for the ores at consuming points, principally Pittsburg and Bethlehem, Pa., and Chicago, Ill.

### A COMPACT DIRECT CONNECTED SET.

In view of the rapid extension in the use of direct connected electrical generating sets and the developments which the same have undergone, it is interesting to notice the varying forms which the same take to adapt themselves to different requirements which their service imposes. In those places where floor space is limited or of great value, as it is often in the power plants of large cities, the compactness of direct connected dynamos with vertical engines is a feature of great utility. The engraving presented herewith shows the Buffalo Forge Company's standard single vertical engine, direct connected to a Lundell dynamo manufactured by the Sprague Electric Company, of New York. Some of the refinements of direct connected machines illustrated in this set may be of interest. The engine illustrated and described may be connected of course to any standard type of generator, and for such purpose the cast-iron sub-base is varied to conform with the requirements of individual cases. In addition to providing a bed for the engine and dynamo, it carries the out-board bearing, which in this case is of the standard Buffalo adjustable type, ring oiling and self-aligning. The cast-iron frame carries the guides within it and supports the cylinder and valve chest. The connecting rod is of forged steel provided at each end with wedge adjusting devices. The crank-shaft, which is large in diameter, is carried in long bearings bolted to the frame. These bearings are provided with an exterior hood or cover which is easily removable to allow for adjustment and to exclude all dust and grit.



The valve, which is of the piston type, governs the steam distribution under the control of a sensitive shaft governor, the design of which makes it easily possible to secure a very close regulation in speed. It should also be mentioned that this valve motion gives practically a constant lead at all points of cut-off. Grease and oil cups on all the pins of the governor and valve gear reduce the friction at these parts and contribute largely to the smooth, steady action afforded by this valve motion.



DIRECT CONNECTED GENERATING SET.

The essential particular of lubrication is well provided for in this engine. The well-known automatic system of oiling by means of running the engine with a bath of lubricant in the bed has been most successfully applied to this type of vertical engine so that the crank-pin, guides and ring oiling main bearings receive a copious supply of lubricant. All other bearing surfaces not cared for in this way are furnished with large sight-feed oil cups. The removable side-plates enclose the working parts so as to afford a dust-proof and oil-tight construction, while allowing of ready access for adjustment. Careful design, high grade of workmanship and materials coupled with copious lubrication and close regulation are some of the essential features of this compact generating set.

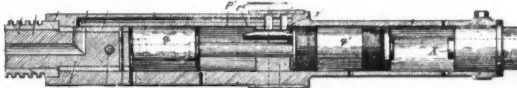
**PATENTS RELATING TO MINING AND METALLURGY**  
UNITED STATES.

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 January 21, 1902.

- 691,350. TUBE-WELDING APPARATUS.—Thomas J. Bray, Jr., Pittsburg, Pa., assignor of one-half to United Engineering and Foundry Company, Pittsburg, Pa., a corporation of Pennsylvania. The combination with a lap welding furnaces, of two sets of welding-rolls located in front of the same, said sets being arranged in staggered relation.
- 691,367. SAFETY BLASTING CARTRIDGE.—Thomas F. Durham, Philadelphia, Pa. A receptacle adapted to contain a fire-extinguishing agent, a cartridge within said receptacle, and means for exploding the cartridge in combination with bands secured around the cartridge, protuberances formed upon the bands at intervals for the purpose of holding the cartridge at a distance from the outer receptacle and allowing for the free circulation of the fire-extinguishing agent therebetween, a block secured in the lower end of the outer receptacle upon which the cartridge rests.
- 691,397. COMPOSITION OF MATTER FOR CEMENT.—James D. MacDonell, Little River, Fla. A composition of matter, consisting of water, carbolic acid, nitro-muriatic acid, nitric acid, crushed calcareous rock, sulphate, and cement of any manufacture.
- 691,404. PORTABLE ELECTRIC WELDING MACHINE.—Henry E. Meyers, Butte, Mont. An electric welding machine, comprising a suitable casing, a laminated block fitting snugly therein, and provided with openings, a primary coil fitting in said openings, a pair of binding posts secured to the casing and connected to the terminals of the primary coil, a circuit terminal also connected to one of said binding posts, a third binding post upon the casing connected

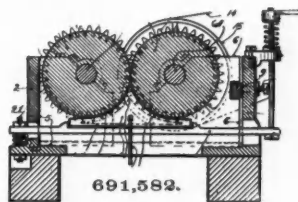
- to the other terminal of said circuit, a switch for throwing the same in and out of circuit with the binding post of the pair not connected to said circuit terminal, and a secondary coil also fitting in the openings of the block and surrounding the primary coil, and having its terminals projecting through one side of the casing.
- 691,421, 691,422, and 691,423. PIGMENT.—Cornelius D. Vreeland, Upper Montclair, N. J. A paint composed of dried sludge derived from the production of sulphate of alumina from bauxite by the acid process, and which has been neutralized by the addition of lime, combined with oxide of zinc and the two together ground with oil.
- 691,437. SPECIFIC GRAVITY SCALE.—Robert J. Bogue, Honeygrove, Tex. A specific-gravity weighing apparatus comprising a pivoted beam, a receptacle for attachment to the beam and having graduations marked thereon, a scale on the beam corresponding to the graduations of the receptacle, a weight for the scale adapted to balance a body of water in the receptacle when placed on the point of its scale corresponding to the graduation at which the water stands in the receptacle, a counterbalance for the dead weight of the receptacle, a second scale on the beam extending at both sides of the pivot of the beam, and a weight for the second scale adapted to balance the difference between the weight of a body contained in the receptacle and an equal bulk of water as indicated by the position of the first weight.
- 691,470. METHOD OF MAKING ALUMINUM HYDRATE.—Harry W. Jordan, Syracuse, N. Y., assignor to the Pittsburg Reduction Company, Pittsburg, Pa., a corporation of Pennsylvania. The method of making aluminum hydrate, which consists in preheating CO<sub>2</sub> gas to a temperature above 200°, and bringing it into contact with the aluminate solution.
- 691,474. APPARATUS FOR CONTROLLING IRON IN BLAST FURNACES.—Luther Lincoln, Boston, Mass., assignor of one-half to Charles S. Gooding, Boston, Mass. In combination with a blast furnace or cupola, an auxiliary reservoir or chamber for the molten metal connected with the hearth of the furnace or cupola by a continuous passage and having a discharge outlet at an elevation higher than the bottom of the hearth, a tuyere pipe and tuyere leading to the furnace, and a valve pipe leading from the tuyere pipe into the upper part of said reservoir or chamber.
- 691,540. APPARATUS FOR ROLLING SOLID OR HOLLOW BODIES.—Josef Giesholdt, Dusseldorf, Germany. In a rolling mill, the combination of an axially movable and rotatable spindle having a squared socket adapted to hold the blank, with a second spindle arranged opposite the socket and in alignment with the first spindle, and with a series of radially adjustable drawing rollers.
- 691,556. ROCK DRILL.—Herman Leineweber, Chicago, Ill., assignor to L. & L. Pneumatic Tool Company, a corporation of Illinois. The combination with a drill holder of a



691,556.

fluid pressure actuated hammering device on the drill holder, and a fluid pressure actuated rotary motor on the drill holder operating to turn and advance it.

- 691,559. PICK, ETC.—Lewis Mathias and Edward L. Ray, Haynes, Iowa. In a pick or other like tool, a suitable head having an opening through which the tool proper is seated, inclined shoulders and a recessed guide forming an extension to the opening, and a wedge shaped key block adapted to fit the opening in the head and having a depending tongue to engage the recessed guide of the opening, said key block having a screw shank and nut.
- 691,565. ART OF ROLLING METAL INGOTS INTO THIN PLATES OR SHEETS.—Edwin Norton, New York, N. Y., assignor to American Can Company, Jersey City, N. J., a corporation of New Jersey. The process consists in first rolling the ingot into a long, wide billet bar, then bearing such wide billet bar into billets or bars whose lengths correspond to one of the dimensions of the singles or of the finished product to be produced, then rolling such wide billets or bars in the cross direction from the first rolling into a long, thin singles plate, then shearing the singles plate into singles, then matching, reheating and rolling the singles successively in packs of twos, fours and eights, in the cross direction from the last preceding rolling.
- 691,582. ORE CRUSHING AND PULVERIZING MACHINERY.—Aaron M. Beam, Denver, Colo. The combination with a suitable base and crushing rolls, of a grind-

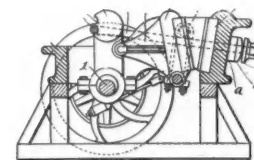


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ing block located below said rolls and arranged to cooperate with the rolls to perform the pulverizing function, a bar for supporting the block, a spring between one end

of said bar and the base, an adjustable bolt passing through said spring and arranged to secure said bar to the base, a removable bracket secured to said base, a vertical adjusting rod extending from the free end of said supporting bar through said bracket, a spring around said rod and resting on said bracket, and a wrench-nut threaded on said rod and arranged to bear on said spring.

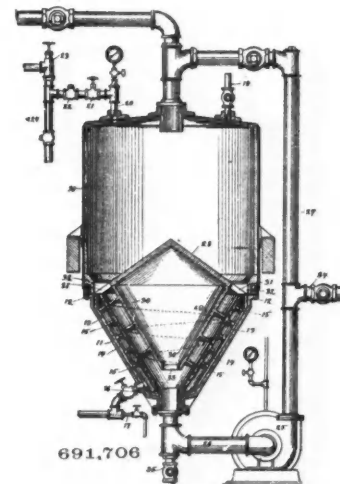
- 691,593. CRUSHING MACHINE.—Morton G. Bunnell, Chicago, Ill., assignor to Frederick C. Austin, Chicago, Ill. A crushing machine comprising a rotary driving-shaft provided with an eccentric; a pitman arranged upon and extending upwardly from the eccentric, and actuated thereby; a vibratory crushing jaw arranged forward of the pitman and supported by swinging links pivotally connected at their lower ends with the lower portion of the movable crushing jaw, and having their upper ends pivotally supported upon the body-frame of the machine; a stationary crushing jaw arranged opposite to and forward of the movable crushing jaw and backed by the forward stationary part of the body



691,593.

frame of the machine, a couple of vibratory tension rods arranged as connections between the pitman and the stationary part of the body, and connected with the latter to swing about an axis forward of the movable jaw; means for adjusting the length of each rod between said axis and the connection of the rod with the pitman; means for permitting the connection between the vibratory tension-rods and pitman to be adjusted toward and away from the axis of the driving shaft; and a power transmitting arm arranged between the movable jaw and the pitman and connecting with the latter at a point between the axis of the driving shaft and the point of connection between the tension-rods and the pitman.

- 691,623. MINER'S HAT.—Alfred Harris, Calumet, Mich. A hat having a depending flap of rubber or other material, a supplemental flap of soft rubber and an encircling wire band arranged at the juncture of the main and supplemental flaps.
- 691,648. COPPER SMELTING FURNACE.—George Mitchell, Los Angeles, Cal. The combination with the crucible, a feed-floor, and a metal chamber or section located above the feed-floor of the furnace, of a series of transversely-arranged partitions forming a zigzag or serpentine passage for the air-blast, an air-blast inlet communicating with the upper end of such air-passage, air-pipes communicating at one end with the lower portion of the air passage or chamber, and their opposite ends with a series of tuyeres and a series of vertical flues extending from the furnace upwardly through said partitions and air chambers or passages.
- 691,706. METALLURGICAL FILTER.—Frederic H. Long, Chicago, Ill., assignor to Ross J. Beatty, trustee, Muncie, Ind. The combination with a vessel having a filter-septum



691,706

and an outlet port for the filtrate beyond such septum, of suitable means for establishing a circulation of the vessel contents and a baffle parallel to and adjacent said septum to intimately direct such circulation over the surface thereof.

- 691,711. ARTIFICIAL GRANITE.—McKenzie Arnn, Glade Spring, Va., assignor to M. B. McKinney, Glade Spring, Va. An artificial granite formed by mixing the following ingredients: 5 pounds borax, 25 pounds pulverized charcoal, 10 pounds black lead (plumbago), 100 pounds salt, 200 pounds cleaned or washed sand (silica or silica), 5 pounds rosin, 100 pounds of pulverized baryta, and 199,155 pounds more or less of slag incorporated with the above-specified quantities of said ingredients to form a total of 100 tons of the composition.

## PERSONAL.

Mr. W. R. Marden, mining engineer, of New York City, has returned from Siberia.

Mr. Franz Cazin, mechanical engineer, has returned to Denver, Colo., and reopened his office in the McPhee Building.

Mr. W. Mitchell has been appointed assistant general manager of the Greene Consolidated Mining Company, Cananea, Mexico.

Mr. W. H. Seamon, of El Paso, Tex., has severed his connection with the Seamon Assay Company to give his whole time to his mining interests.

Mr. G. T. Coffey, of London, and Mr. G. Hother-sall, of Nevada City, Cal., have gone to the Klondike in the interest of London mining companies.

Mr. H. C. Bellinger, late smelter superintendent of the Montana Ore Purchasing Company, at Butte, Mont., is succeeded by assistant superintendent Blossom.

Mr. Thomas H. Barclay, former superintendent of the Elkhart Mine, Chloride, Ariz., has been appointed superintendent of the Hall Mines, Limited, at Nelson, B. C.

Mr. B. J. Forest, mining engineer, lately engaged by Sir William Van Horne in the South African Republic, who has been at Sydney, N. S., has returned to Toronto, his home.

Lieut. W. Hoggatt, who has been superintendent of the Julian gold mine at Berner's Bay, Alaska, is on a visit to his home at Evansville, Ind. He will return to Alaska in April.

Mr. F. B. Whitmore, formerly in charge of the Union Copper Company's concentrator at Gold Hill, N. C., has accepted a position with the Federal Lead Company, of St. Louis, Mo.

Prof. Alvin Phillips, mining engineer and metallurgist of Denver, Colo., returned from his eastern trip recently and has left on a professional trip to Custer and Chaffee counties, Colo.

Mr. Robert Luce, president of the Press Clipping Bureau of Boston, Mass., has been appointed House Chairman of the Committee on Election Laws of the Massachusetts Legislature.

Mr. Guy R. Johnson, recently superintendent of the blast furnace of the Sharon Steel Company, Sharon, Pa., has resigned to accept a position as blast furnace superintendent at Joliet, Ill.

Mr. John S. Smith, assistant auditor of the Northern Central Railway Company, has been promoted to the position of assistant auditor of coal freight receipts of the Pennsylvania Railroad.

Mr. J. M. Beckwith, formerly manager of the Silver King Mine, Calico, Cal., and subsequently of Goon-garie, West Australia, is now general manager of Las Minas Becerrea, Lugu, Galicia, Spain.

Mr. D. S. Richards has been appointed superintendent of the Liberal Mine, near Hailey, Ida., succeeding Mr. C. W. Courtney, who is now with a company developing mines at Thunder Mountain.

Mr. C. W. Fielding, of London, a director of the Rio Tinto Mining Company, is in New York City. It is said he came to confer with the controlling interests in the Amalgamated Copper Company.

Mr. Thomas J. Brown, resident manager at Sydney Mines, C. B., of the Nova Scotia Steel and Coal Company, has been appointed general superintendent of the company, to succeed the late Simon Fraser.

Mr. L. Maurice Cockerill, of London, Eng., has been appointed manager of the United Mexican Mines Association, Limited, at Guanajuato, Mex., succeeding Mr. Richard Henry Williams, who resigned some months ago.

Mr. Max Michaelis has determined to retire from the firm of Wernher, Beit & Company, of London, and Mr. Frederick Eckstein, for many years the representative of the firm in Johannesburg, will become a partner.

Mr. H. R. Barnhurst, for many years general superintendent of the Erie City Iron Works, of Erie, Pa., has been appointed superintendent in charge of the new shops of the Allis-Chalmers Company, at West Allis, near Milwaukee, Wis.

Mr. E. G. Rust, formerly chief engineer of the Colorado Fuel and Iron Company's works at Pueblo, Colo., has been appointed general superintendent. Mr. Rust is succeeded as chief engineer by Mr. A. H. Helander, formerly chief draftsman.

Mr. W. K. Smith, for many years connected with the civil engineering departments of the Carnegie interests, with headquarters at Pittsburg, Pa., has tendered his resignation. He will practice as consulting engineer in Pittsburg.

Mr. S. H. Waddell, secretary and treasurer of the Union Steel Company, has resigned to become assistant to President Thomas Lynch, of the United States Steel Corporation, and vice-president of all that company's subsidiary coke companies.

Mr. Leonard C. Hanna, executive head of M. A. Hanna & Co., has resigned as president of the Besse-

mer Ore Association. Mr. Wm. G. Mather, president of the Cleveland Cliffs Iron Company, succeeds Mr. Hanna as president of the association.

Mr. Don H. Bacon, chairman of the Executive Committee of the Tennessee Coal, Iron and Railroad Company, has returned to his headquarters in New York after a visit of more than a fortnight to the properties of the company in the Birmingham (Ala.) district.

Mr. B. H. Warren, first vice-president of the Westinghouse Electric and Manufacturing Company, of Pittsburg, Pa., and executive officer of the concern, has resigned. Mr. F. H. Taylor, fourth vice-president, was elected to fill the vacancy, and Mr. L. A. Osborne, general manager of the East Pittsburg works was elected fourth vice-president.

Mr. William C. Potter has become a member of the firm of Dickman & Mackenzie, of Chicago, Ill. The firm name henceforth will be Dickman, Mackenzie & Potter, and the firm will continue to act as consulting mining engineers, chemists and metallurgists. Mr. Potter has for several years been mining engineer and consulting metallurgist for the Atchison, Topeka & Santa Fe Railroad.

Mr. John Dwyer has resigned as superintendent of the Birmingham (Ala.) rolling mills, controlled and operated by the Republic Iron and Steel Company. Mr. Dwyer was connected with these mills for 22 years. Poor health caused him to resign. He is succeeded by Mr. J. H. Pritchard, superintendent of the Gate City mills belonging to the Republic Company. Mr. Pritchard's successor is Mr. T. P. Walker, who was assistant superintendent.

## OBITUARY.

Abraham Lee, who died in Denver, Colo., recently, went west in '59 and was one of the locators of placers in California Gulch, near Leadville, and was active in the development of placers and mines in Lake and Park counties.

Edwin Victor Clergue, who recently died in Chicago, Ill., of heart disease, was general manager of the Algoma Commercial Company, and mining manager of the Clergue interests at Sault Ste. Marie, Ont. His death was brought on by exposure in his work about a year ago.

Eugene Dupont, president of the powder manufacturing firm of E. I. Dupont de Nemours & Company, died on January 28 at his home, in Christiana Hundred, near Wilmington, Del. He was the son of Alexis I. Dupont, and succeeded the late General Henry Dupont as president of the company in 1889. Mr. Dupont was 61 years old.

Former State Senator John Fay, of California, died January 28 at the S. R. Smith Infirmary, at New Brighton, S. I., N. Y., of Bright's disease, aged 74 years. Mr. Fay was born in New York City. During the gold excitement in 1849 he went to San Francisco and engaged in mining enterprises, in which he was successful. He later went into other business and became a real estate dealer, and was prominent in politics.

Chester Griswold, who died recently at his home in New York City, was president of the Crown Point Iron Company, of Troy, N. Y. He was born in Troy in 1844, his father, John A. Griswold, being the owner of Bessemer steel rights in this country, and operating a large plant at Troy. Chester Griswold went into business with his father and later became the president of the Crown Point Iron Company. He was also a director of the Hudson River Ore and Iron Company, and of the Adirondack Railway Company. For many years he represented the Troy mill in New York City when that plant was one of the leading steel producers in this country.

Leopold C. Bierwith, secretary and general agent of the New Jersey Iron Mining Company, died at his home in Dover, N. J., on February 3, after an illness of several months. Mr. Bierwith was a son of the late Leopold von Bierwith, and was born in New York City on June 5, 1838. At the age of 16 he went to the University of Clausthal, Germany, and later to the University of Heidelberg, studying mining engineering and mineralogy. After spending 3 years at these universities, he passed 2 years obtaining a practical knowledge of iron furnace and rolling mill work in England. At the age of 21 he returned to America and entered the employ of the Trenton Iron Company.

In 1864 he went to Dover and purchased mining properties for parties who later formed the New Jersey Iron Mining Company, of which he was the secretary and general agent from the date of its incorporation to the time of his death.

Mr. Bierwith was a member of the American Society of Mining Engineers, the Franklin Institute and the New Jersey Historical Society. He leaves a widow and a son.

## SOCIETIES AND TECHNICAL SCHOOLS.

UNIVERSITY OF CALIFORNIA.—Work is to begin soon on the new mining building which Mrs. Hearst will

erect as a memorial to her husband, the late Senator Hearst. President Wheeler has announced that the plans for the structure have been completed and accepted by Mrs. Hearst and that the contract has been let for the construction. The building is to cost \$500,000, and will be the first large structure of the great architectural scheme planned by Mrs. Hearst.

## INDUSTRIAL.

James Leffel & Company, of Springfield, O., have an order for a 35-in. horizontal turbine to be shipped to the Caucasus.

The Nordberg Manufacturing Company, of Milwaukee, Wis., will erect a foundry building, 120 by 350 ft. in the town of Lake.

The referees' sale of the Troy Steel plant at Troy, N. Y., which was advertised for February 6, has been postponed to a later date.

The Robert Aitchison Perforated Metal Company, of Chicago, Ill., is stated to have substantial orders in hand for Glasgow and New Zealand.

The Union Iron Works, of San Francisco, Cal., has shipped 6 20-ton converters to the Greene Consolidated Copper Company, Cananea, Mex.

The Philadelphia offices of N. & G. Taylor Company have been removed to the Mariner and Merchant Building, corner of Chestnut and Third streets.

The Central Coal and Coke Company, with headquarters at Kansas City, Mo., has placed an order for an Ottumwa box car loader, to be installed at its Sweetwater Mine, near Rock Springs, Wyo.

The British Westinghouse Electric and Manufacturing Company's new plant at Manchester, Eng., is to be equipped with some 1,700 pulleys of various sizes manufactured by the American Pulley Company, of Philadelphia, Pa.

The Rand Drill Company, of New York City, has opened an office in the Park Building, Pittsburg, with F. C. Weber in charge. The Rand Company manufactures air and gas compressors, blowing engines, rock drills and quarry and mining machinery.

The firm of Parke & Lacy, of San Francisco, Cal., has been reorganized as Harron, Rickard & McCone. The firm states that it will give the same attention to mining machinery business as under the old name, and will seek to please an increased number of patrons.

Wonham & Magor, of 29 Broadway, New York City, are going to erect a new shop for the manufacture of small steel cars, portable track and industrial railway equipment. They propose to install the latest machinery for the economical production of such material.

At the recent annual meeting of the stockholders of the Brier Hill Iron and Steel Company, of Youngstown, O., directors were elected as follows: George Tod, Henry Tod, William Tod, J. G. Butler, Jr., and H. H. Stambaugh. George Tod was elected president and J. G. Butler, Jr., general manager.

J. B. McIntire, of the Park Building, Pittsburg, Pa., is in the market for the entire equipment of a Portland cement plant, including engines, boilers, dryers, crushers, grinders, mills, kilns, elevators, conveyor bins, larries, generators, motors, cranes, pumps, blowers, tanks and building material.

At the recent annual meeting of the Ensley Land Company, Don H. Bacon, chairman of the board of trustees of the Tennessee Coal and Iron Company, was elected president. The Tennessee Company thus comes in direct control of the Ensley Land Company and its large properties.

At the recent annual meeting of the Belfont Iron Works Company, of Ironton, O., B. H. Burr was elected president and S. G. Gilfillan a director, to fill the vacancy occasioned by the death of John G. Peebles. The directors decided to erect another blast furnace adjoining the present stack.

The Stilwell-Bierce & Smith-Vaile Company, of Dayton, O., with New York City offices in the Washington Life Building, has secured an order through W. H. Crossman & Bro. for a 1,000 h. p. outfit of turbine water wheels, which is intended to be installed in an electrical plant at Santos, Brazil.

Plans are being prepared by Julian Kennedy, of Pittsburg, Pa., for a new furnace for the Rochester & Pittsburg Coal Company, near Dubois, Pa. It will have an 80-ft. stack, 19 ft. at the bosh, and will run on foundry iron. The project is promoted by the Buffalo, Rochester & Pittsburg Railroad to secure a feeder.

The United Coke and Gas Company has closed a contract with the Sharon Steel Company, of Sharon, Pa., for the erection of 212 Schenewind ovens. The daily capacity of the plant will be: Coal carbonized, 1,696 net tons; blast furnace coke produced, 1,272 net tons; total gas output, 15,264,000 cu. ft., and surplus gas output, 6,784,000 cu. ft.

Becker & Co., of Osaka, Kobe, etc., Japan, have taken over the business conducted for several years by Heyn, Brockelmann & Co., who handled various lines of American machinery, etc. The Becker people



are reported to be at present making some substantial purchases in the States. Among orders recently placed is one for a large testing machine to be manufactured by the Reible Bros. Testing Machine Company of Philadelphia.

Late sales and shipments reported from the Colorado office of the Jeanesville Iron Works Company, of Jeanesville, Pa., are: 2 compound condensing pumps 800 ft. lift to Leadville, Colo.; another to Cripple Creek, Colo.; a compound condensing pump 1,200 ft. lift to Independence, Colo.; a simple duplex pump 600 ft. lift to Breckenridge, Colo.; a 1 simple duplex pump to Arizona, and 2 electric power station pumps 650 ft. lift for Old Mexico.

At the recent annual meeting of the Pressed Steel Car Company, at Jersey City, N. J., the following directors were elected: A. H. Larkin, F. N. Hoffstot, J. W. Friend, J. H. Reed, T. H. Given, H. E. Moller, Henry Phipps, G. E. Macklin and F. G. Ely. F. N. Hoffstot was re-elected president and J. W. Friend, vice-president. The second vice-president, treasurer and secretary were not appointed. P. S. Jenks was appointed assistant treasurer.

The Canadian Niagara Power Company has awarded the contract for the construction of the new wheel pit to Dawson & Reilly, of St. Catharines, Ont. The cost of the work will be over \$500,000. The new pit will be about 175 ft. long, 160 ft. deep and 20 ft. wide approximately, and will be cut through solid rock. The company has over \$1,000,000 worth of work under contract. Work on the new tunnel on the Canadian side is progressing.

Machinery is now being purchased by the Standard Pneumatic Tool Company for installation in the large plant which it is erecting in Germany. Mr. W. H. Tew, formerly connected with the American Locomotive Company, Brooks Works, Dunkirk, N. Y., and later with the mechanical engineering department of the Chicago & Northwestern Railroad, has been appointed managing director of the newly organized branch, with headquarters in Berlin.

The Cataract Power and Conduit Company, of Niagara Falls, N. Y., has recently awarded the Westinghouse Electric and Manufacturing Company, of Pittsburg, a contract for seven 2,500 h.-p. oil-insulated, water-cooled transformers. These transformers will be wound for 2,200 volts, 2-phase, to 11,000 or 22,000 volts, 3-phase, and will duplicate the present equipment in the transformer house at Niagara Falls.

The Chrome Steel Company, of Brooklyn, N. Y., is to remove its plant from Brooklyn to Carteret, N. J., and contracts for the new buildings are being let. Some of the machinery has been purchased, including a large universal forging machine, from Germany. Allis engines and Garrison boilers were bought. Henry J. White, of 149 Broadway, New York City, is consulting engineer on the work. The New York offices of the company are at 7 Wall street. Ferdinand E. Canda, president, is making the purchases. The other officers of the concern are: Charles J. Canda, vice-president; F. Mora Canda, secretary, and Thomas I. Jones, treasurer.

The Magnolia Metal Company has purchased an office building and factory at 113-115 Bank street New York City. The company will take immediate possession of the factory, which will be fitted with the most modern appliances for manufacturing on a large scale at lowest cost. The company says it is prepared to turn out promptly all orders for Magnolia, Defender, Mystic and Adamant metals, and to furnish at close competitive prices all grades of babbitt metals of superior quality, as well as solder, electrotypes, linotype, stereotyped metals, special metals, railroad brasses, etc. With factories at New York City, Stirling, N. J., Chicago and Montreal, the company now has excellent facilities for manufacturing and promptly delivering babbitt metals.

The Baldwin Locomotive Works, of Philadelphia, Pa., report that every department is operated to full capacity. Inquiries continue brisk, and a large amount of work has been booked. The 1901 output was 1,375 locomotives of various types, a gain in actual number over 1900, and a further gain from the fact that the average weight per locomotive was fully 10 per cent greater. Among recent orders may be mentioned 80 engines of various types for the Southern Pacific Railway Company, and 10 compressed air locomotives from the Consolidated Coal Company of West Virginia. Shipments are going forward regularly; one engine a day is being delivered to the Pennsylvania Railroad Company. The Baldwin Company now employs over 11,000 workmen in its Philadelphia plant.

Forty representatives of the Federated Co-operative Window Glass Company, representing more than 800 pots, and including the principal independent plants in New York, New Jersey, Pennsylvania, West Virginia, Ohio, Indiana and Illinois, met in Indianapolis January 30. The following officers were elected: President, J. R. Johnston; vice-presidents, George Hires and August Phillipert; treasurer, W. L. Monroe; assistant treasurer, Emil Major; secretary, Leopold Mambourg; assistant secretary, E. H.

Flood. A committee was appointed to secure a charter, under the laws of New Jersey, for the organization of a company, similar to that formerly operated by the American Glass Company. The capitalization of the new company will be \$600,000, and the various plants will pay into the company \$300 per pot for working capital.

The Pelton Water Wheel Company, of New York and San Francisco, reports a large number of orders recently. Among Pelton wheels recently shipped or in process of construction may be mentioned the following: Wheels for driving 4 500-kw. units for electrical transmission in Colorado; 1,200-h. p. wheel plant, for compressor in Idaho; 2 600-h. p. plants for electric transmission in Central California; 500-h. p. wheel, for electric lighting plant in Lundy, Cal.; 2 wheel units, each 550-h. p., in Southern California; 3 units, each 300 h. p., for an electric power transmission company in the Hawaiian Islands; 1 1,600-h. p. wheel for electric transmission in Colorado; 1 200-h. p. compressor wheel for British Columbia; 3 wheels for driving 1,000-kw. generators for electric transmission in Northern California; wheel for 900-h. p. unit in British Columbia, this being the second unit installed; wheel for 1,500-h. p. electric transmission plant in Tuolumne County, California (second unit); wheel for driving 1,000-kw. generator for mine and transmission plant in Calaveras County, California (second unit); 4 units, each 550-h. p., for electric transmission plant in Southern California. The company states that its foreign trade, especially in wheels for driving electrical apparatus, greatly increased during 1901, indicating a growing appreciation of American machinery on the part of foreign engineers.

#### TRADE CATALOGUES.

Circular No. 1028 published by the Westinghouse Electric and Manufacturing Company, of Pittsburg, Pa., describes this company's rotary converters and No. 1058 treats of the Westinghouse No. 76 railway motor.

Burton Fils, of 68 Rue de Morais, Paris, France, issue a 68-page pamphlet describing the elevating, conveying and transmission machinery they manufacture. This includes Ewart and Harrison chain conveyors, also belt conveyors. Iron elevator buckets and attachments, sprockets, etc., are described and prices given. Numerous cuts show the various uses to which such conveying machinery may be put.

A neat little 12-page pamphlet issued by the Burt Manufacturing Company, of Akron, O., sets forth the merits of the Cross oil filter, giving the names of many users and some flattering testimonials. The filter is intended to save the oil that passes through machinery, frequently amounting to 50 per cent or over of the amount used. The filter is made in 12 sizes, having capacities from 15 to over 400 gal. per day.

The American Metal Hose Company, of St. Louis, Mo., issues a catalogue of its flexible metallic hose (Witzenmann system). This hose, the company says, being metallic, will not kink, crush or char and is impervious to the action of steam, oils, petroleum, air, gas or gasoline, lyes, acids, or ammonia. It is constructed from a metallic tape rolled into a spiral; a suitable packing by the process used, is completely protected internally and externally.

Max Dreverhoff, of Dresden, Germany, issues a price-list of his filter papers. Accompanying the price-list to this office were samples of some of the many grades the maker has put on the market. Some are particularly adapted for filtering oils and essences, others for ordinary laboratory work, others for exact quantitative work, and still others for purifying liquids containing bacteria. Messrs. Eimer & Amend, of New York City, and the Henry Heil Chemical Company, of St. Louis, Mo., handle these filter papers.

Firms intending to use or already using oil as fuel will find information of interest in an attractive 24-page pamphlet, published by Tate, Jones & Company, of Pittsburg, Pa. The pamphlet refers to the possibilities of oil fuel with particular reference to Beaumont oil, and gives information regarding the best methods of using it. The company manufactures the Kirkwood burner, that is said not to clog, to be easily cleaned and to have a graduated scale for both the steam and oil supply. The company also manufactures the Kirkwood duplicate pumping and heating system for supplying oil to boiler plants.

Wiggins' patent clutch wood split pulleys are described in a little pamphlet issued by the Tacoma Automatic Scales Company, of Tacoma, Wash. The surface of these pulleys, being of fir or spruce is stated to present a better surface than any other wood adaptable for pulleys, being firm, hard, close-grained and light. Being lighter than iron, it is claimed, the tension on the belt may be reduced, reducing the friction of the journal and the strain on shafting. It is also claimed that the pulleys can be put on or taken off the shaft very easily and quickly, and they are sold on a guarantee not to slip nor cut the shaft.

A finely illustrated pamphlet of 132 pages, published by Pawling & Harnischfeger, of Milwaukee, Wis., con-

tains much descriptive matter about electric traveling cranes. The pamphlet states that the type A class of cranes made by the firm is suited for nearly every kind of service that can be met. The sizes run from 5 to 150 tons capacity. Every trolley in this type is stated to have 2 drums of ample size to take the necessary chain or rope at a single rap, and there are but 2 reductions of speed between the hoisting motor pinion and the driving gear. The brake for lowering is said to run at moderate speed and being always flooded with oil, the wear and tear is reduced to a minimum. The hoisting motor is fitted with a simple automatic brake described as powerful enough to sustain the full load of the crane independent of the main brake. Cuts show these cranes at work in the plants of some of the largest industrial concerns in this country and at shipbuilding works in Russia. For lighter work Pawling & Harnischfeger make electric hoists, hand traveling cranes, chain block traveling cranes, and chain block trolleys for hand travelers, overhead runways, etc. A long list of users is given including many foreign concerns.

Mining companies, contractors and all who are interested in the construction of roads, will find information of value in an 80-page illustrated pamphlet published by the Western Wheeled Scraper Company, of Aurora, Ill. The company states that the merits of its wheeled scrapers are capacity, light draft, ease of handling, simplicity, and durability. The pan is made of one piece of steel pressed to shape without heating; the axles have sand collars to exclude dirt from the spindles and the levers, tongue-irons, front, back and draft hooks are made of steel. These scrapers are built in 4 sizes. A new automatic gate for handling sand or light soil is stated to be simple and substantial, while not holding the contents of the scoop in dumping. For use on short hauls the Western drag scraper with a flanged double bottom made of extra hard steel is recommended. The pamphlet further states that this scraper fills easily, is durable, of light draft and can be dumped sideways. The company manufactures also the Western stone crusher, a machine of the jaw type, which is said to be constructed on an entirely new principle, utilizing the advantages of both the crank shaft and the double cam shaft and roller. Among other products of the company are road machines, dump cars, elevating graders, ploughs, wagons and dump carts. Wonham & Magor, of 29 Broadway, New York City, are New York and sole export representatives.

#### GENERAL MINING NEWS.

*United Mine Workers' Convention.*—The convention at Indianapolis after a session of nearly two weeks closed January 30. The result of the second week's deliberations may be summarized thus: The executive committee was authorized to levy an assessment of 10c. a month on every member in good standing for maintaining and terminating strikes; the constitution was amended so as to provide for the election of officers by direct vote instead of by delegates in convention; the officers of the Mine Workers' National Association were each voted an increase in salary.

The convention manifested much concern over the organization in Virginia, West Virginia and Kentucky. The conservative members insisted on allowing the present scale to stand until these states can be unionized and brought into joint conference with the 4 states that now sign the competitive scale. It was decided to give special attention to the organization of West Virginia during the coming year. Indianapolis was selected for next year's convention.

The joint conference between the operators and miners over the annual wage agreement began January 30.

President Mitchell, of the Mine Workers, was elected temporary chairman. F. L. Robins, of Pittsburg, announced the names of G. W. Schluderberg, O. A. Blackburn, W. B. Rodgers, J. S. Tally, of Terre Haute; W. S. Boyle, Hugh Shirley and J. K. Seifert, and C. E. Mauer, of Ohio; L. H. Chapman, J. H. Windner and Thomas Johnson, H. N. Taylor, of Illinois; T. H. Peabody, W. N. Keefer, and G. T. Cutts, to constitute the operators' scale committees. The miners' representatives on the scale committee are J. L. Lewis, W. N. Haskins, D. H. Sullivan and G. W. Savage for Ohio; W. D. Ryan, W. R. Russell, J. T. Reynolds, and J. B. Wilson for Illinois; W. D. Van Horn, James Henner, John Boyle and J. H. Webster for Indiana.

George Traver, of Chicago, was made permanent chairman. The miners' scale committee submitted the following demands: 1. A general advance of 10 per cent for mining on present prices. 2. Absolute run-of-mine basis for entire competitive field. 3. Uniform scale for outside laborers, 8 hours to constitute a day. 4. Straight differential of 7c. a ton between pick and machine mining. 5. Drivers' wages to be advanced to \$2.25 a day, with 10 per cent added. 6. Open powder market. 7. Check-off system for competitive district.

These demands were opposed by the operators, who denied that the coal market during the past year



justified higher wages and stated their opposition to any changes in the differential and to the proposed check-off system. The operators also proposed a 10 per cent reduction in the price of mining.

**Indiana-Illinois Coal Mines Consolidation.**—The proposed consolidated ownership of the coal mines of Indiana and Illinois, for which options were taken on the mines some time ago, has fallen through. The Chicago and New York men who were to underwrite the company, reported that the money was ready up to \$50,000,000, but that the expert investigation of the two properties to ascertain how their values compared with the amounts named in the options would take some time, and an extension of the time became necessary. This extension could not be obtained of those who had given options some months ago. Some large operators do not think this will be the end of the project, but say that it will probably be revived and promoted by other persons.

## ARIZONA.

## COCHISE COUNTY.

**Black Diamond Copper Mining Company.**—This company's property is on the eastern slope of the Dragoons, 9 miles west of Pearce. The ore is an iron and copper sulphide, said to run 5 per cent to 7 per cent copper, with good values in silver. The mine was first opened as a silver mine. The ore occurs in a contact between limestone and porphyry. A smelting plant, which will include a 44 by 120-in. furnace of 200 tons capacity, and a cupola furnace, 38 in. diameter for re-smelting the matte, with other machinery is being furnished by the Allis-Chalmers Company. A 1½-mile aerial tramway will carry the ore from the mine to the smelter, the difference in elevation between the two being 800 ft. The necessary power plant will use fuel oil. The smelting plant will be enclosed in a 76 by 190-ft. steel building. Water will be conveyed through a 3½-mile pipe line from springs. The officers are: Frank H. Crocard, of Wheeling, W. Va.; J. G. Hearne, James A. McBain, N. O. Bagge and Frank C. Hoffman. Mr. Bagge is manager at Pearce.

(From Our Special Correspondent.)

**Copper Belle.**—These mines, at Gleason, continue to ship sulphide ore to the smelter at Silver City and about an equal amount of copper ore is hoisted which is too low grade to ship. About 40 men are employed in the mine. The low price for copper has greatly diminished the smelter returns, and it is only by great economy that profits are obtained. It is rumored that the El Paso & Southwestern Railway will put a spur into the camp. This will cut off the hauling charge of \$4 a ton. The shipments are reported to average 5 oz. of silver, 0.14 oz. gold and 7 per cent copper, with 36 per cent of iron and 5 per cent silica.

## GRAHAM COUNTY.

(From Our Special Correspondent.)

**Gold Hill Mining and Milling Company.**—This company has taken an option on a group of copper claims and is driving 3 tunnels. The ore is principally copper, with a good percentage in gold.

## SANTA CRUZ COUNTY.

(From Our Special Correspondent.)

**Wandering Jew.**—Allen T. Bird has let a contract for sinking 100 ft. on this mine in Tyndall District. Another shaft will be sunk 250 ft. further along the cropping. The ores are high grade in silver and copper, carrying some gold.

## CALIFORNIA.

## AMADOR COUNTY.

(From Our Special Correspondent.)

**Bay State.**—At this mine, at Plymouth, work has been resumed with 2 shifts under the superintendence of Mr. Brendt. It is the intention to cross-cut east 800 ft.

**Kirkwood.**—This mine, at Jackson, Domenico Boro, superintendent, will have a 900-ft. shaft when the 200 ft. now being sunk are finished. Operations are in the nature of prospecting, the ledge at the 700-ft. level being without pay.

## BUTTE COUNTY.

(From Our Special Correspondent.)

**Feather River Exploration Company.**—This company, at Oroville, is to have 2 new dredgers built at the Risdon Iron Works, San Francisco.

## CALAVERAS COUNTY.

(From Our Special Correspondent.)

**Beatrice.**—Attachments on this mine, near Murphys, have been dismissed, debts paid and work resumed. An air compressor has been ordered to run machine drills.

**Blue Jay.**—F. O. Courtmarsh, of the Fannie-Marie Mine, at Glencoe, has sold for himself and partner, J. Guecco, this mine at Mokelumne Hill. It is understood that the mine has been bought by the owners of the Fannie-Marie.

**Calaveras Mining, Water and Power Company.**—

This company and the Rigney and Swauk mines, near San Andreas, is ready to begin hydraulic mining.

**Continental.**—Tests of ore at this mine near West Point encourage the owners to provide a 10-stamp mill.

**Del Monte Mining and Milling Company.**—This company at Railroad Flat has purchased a compressor and outfit for power drills for the new cross-cut tunnel. The force of men has been increased.

**Melones Consolidated.**—Wm. J. Loring, superintendent of this mine at Robinson has resigned to take charge of a mine at Coolgardie, West Australia, and W. C. Ralston, the general manager, is now in personal charge.

**Paragon.**—This mine, at West Point, is to resume operations.

**Rattler.**—On the Tilford Ranch, Salt Spring Valley, 9 miles north of Milton, fires last fall burned the brush and chaparral covering the hills and 5 parallel quartz veins have been found, one of them quite wide.

**Reliance.**—At this mine, at West Point, John McMahon, superintendent, a new mill has been erected and a tramway is being built.

**Sugar Pine.**—At this mine, near Angels Camp, Joseph McClay, superintendent, the new 10-stamp mill is nearly completed. This, as well as the hoist, will be run by water-power.

**Sunrise.**—There are now 18 men on the pay-roll of this company at Glencoe. Thomas McSorley is superintendent.

**Texas.**—This mine at West Point, which was worked by Mexicans many years ago, is now operated by Sheridan & Rumperi.

**Yellow Aster.**—George Congdon has resumed work on this mine at West Point.

## ELDORADO COUNTY.

(From Our Special Correspondent.)

**Hydraulic Permits.**—Applications for permits to mine by hydraulic process have been made for the Hidden Treasure Mine, at Kelsey, by J. C. Murphy; Chile Ravine Mine, near Placerville, by John Pascoe and W. H. Secombe; Happy Flat Mine, Garden Valley, by W. T. Russell, and Wentz Bros., Pleasant Valley.

**Slate Quarries.**—There are only two slate quarries producing in California and both are near Placerville. F. S. Chadbourne, of San Francisco, is manager of the California Slate Company and David Williams is foreman. The Eureka Slate Company's quarries at Kelsey, near Placerville, are managed by John Winsboro, with Wm. J. Dingee, of San Francisco, president. The quarries are now quite active.

**Golconda.**—This mine, near Shingle Springs, recently opened up by Messrs. Anable & Dunkee, has been sold to the Golden Gate Mining Company, composed of Bridgeport, Conn., people.

**Gold Bug.**—This hydraulic mine, at Georgetown, W. S. Thorne, manager, is ready to start the hydraulic elevator.

**Pyramid.**—This mine, which was closed a long time has been opened and equipped with a 15-stamp mill, compressors, hoist, etc. The superintendent is Mr. Bluett.

**St. Clair.**—This mine at Kelsey is owned by Jas. McGraw, Wm. Roberts and Mrs. May McGraw, of the same place. B. L. Peters is superintendent. The mill and 5-stamp mill are run by water-power.

**Vandalia.**—At this mine, at Canyon, Cornish rolls and a cyanide plant are being put in. The mine is owned by John Rosenfeld's Sons, of San Francisco. Charles E. Seymour, of Canyon, is superintendent. Twenty-five men are employed.

**Zantgraft.**—This mine is close to the American River. The nearest post-office is Newcastle. E. A. Eastwood, superintendent, has about completed the buildings, and the mine will soon be in operation again. It has been a large producer.

## FRESNO COUNTY.

(From Our Special Correspondent.)

**Apache.**—E. M. and R. E. Stevens, of Selma, have purchased a ¼ interest in this mine, near Letcher. In company with M. Sides, T. B. Matthews, J. McClurg and D. Michaels, they are also developing some properties on Deer Creek, about 2 miles from the Apache.

## HUMBOLDT COUNTY.

(From Our Special Correspondent.)

**Pioneer.**—J. Strauss and Mr. Hale have bought an interest in this mine, owned by Fehely & Dubbs, at Orleans.

**Red Cap.**—Wm. Lord is to reopen this mine, near Orleans. The mine paid well some years since and there is considerable ground left.

## KERN COUNTY.

(From Our Special Correspondent.)

**Butte.**—The 850-ft. drift between the 2 shafts of this mine at Randsburg, Percy H. McMahon, superin-

tendent, is completed. Recent work has shown a new body of ore of good value and width. The Butte is one of the largest producers at Randsburg.

**Grand Oil Company.**—This company has holdings near Sunset District and is preparing to sink a well 3,000 ft. to test the theory of Marcus Duval regarding the oil resources of the southern end of the San Joaquin valley. The company has also found some gold indications. H. Pennington, of Reno, Nev., is president of the company.

**Greenback Mining Company.**—This company that has a copper mine near Woody, has closed down.

**Randsburg Mills.**—At Randsburg there are now 162 stamps dropping, 130 of which belong to the mills of the Yellow Aster Mining Company. A 5-stamp mill is being put up on the Val Verde Mine, near Johannesburg.

**Talk Mining Company.**—This company has just completed a cyanide plant near Woody that is now in operation. It is running on old tailings said to carry values of \$7 per ton.

**Wissman.**—This property has been sold to the Buena Perde Mining Company and will be operated by it. The price is not stated.

## LOS ANGELES COUNTY.

(From Our Special Correspondent.)

Los Angeles and Orange County men have filed on 5,200 acres of placer and 240 acres of lode deposits in the Sierra Madre mountains. It is hoped to find the source of the placer gold found along the San Gabriel River. The Santa Ana River has its source on the western end of the locations. Those interested are: Geo. Taylor, Charles Bowler and Q. Wicken, of Los Angeles; H. McPhee, T. J. Alexander, W. M. Scott, J. C. Quick, G. J. Mosebaugh and J. R. Bowler, of Santa Orange County, and S. M. Davis, of Orange.

**Big Horn.**—F. C. Fenner, of Los Angeles, representing the Lowell & California Mining Company, is developing this mine, 33 miles southeast of Palmdale. There are 15 men at work running tunnels. The gold ore is low grade, but there is supposed to be a large body of it. The mine was worked some years ago.

**Manganese Claims.**—E. L. Baker, of Los Angeles, has located with his partners several manganese claims about 10 miles north of Acton. The claims have been located because of some talk of making bessemer steel from the hematite deposits in San Bernardino and Riverside counties. Manganese cannot be shipped from California at a profit and the home demand is very light.

## MADEIRA COUNTY.

(From Our Special Correspondent.)

**California Copper Company.**—The personal property has been bought in at sheriff's sale by the Stockton Lumber Company, which held a judgment of about \$3,000. The Southern Pacific Company bought in the smelter and mine for \$8,206. The property still owes \$4,000 for taxes.

## SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

**Bagdad.**—Ore averaging \$22 per ton in silver, gold and copper is being taken from the 200-ft. level of this mine at Ludlow, E. H. Stagg, superintendent. A run of 1,000 tons of ore at the Barstow Mill returned \$17,000 in gold.

**Brooklyn.**—At this mine, at Dale, a bored well is being sunk, the dug well having caved. Good water is scarce in that district.

**Ivanpah Smelting Company.**—This company, which owns the Copper World Mine, at Rosalie, is about to put up a 60-ton smelter. A 12-mile traction road is to be built from the smelter to the California Eastern Railway. The Copper World is the largest producing copper mine in Southern California.

**Jackson Camp.**—At this camp, near Danby, Mr. Jackson has 20 men at work building a 10-stamp mill. The Hunter Hill, in the same section, has been bonded to an eastern company.

**O. K.**—The county supervisors have appropriated money for a road from this mine, at Dale, Joseph Ingersoll, superintendent, to the road now leading from the Brooklyn Mine to Walter's Station, on the Southern Pacific Railroad. Virginia Dale Mining District will now have a road to Walters and another to Banning, one 60 and one 80 miles long.

**Providence Mountain Mining Company.**—This Los Angeles Company has taken up 10 claims on the hematite deposits on the west side of the Providence Mountains in Gold Belt District, 40 miles from Ludlow, and 25 miles from Fenner, on the Santa Fe road. These deposits have long been known, but have never been utilized. The surveys of the Los Angeles & Salt Lake Railroad pass close to the locations. The directors are C. A. Stilson, president; W. H. Workman, E. E. Hall, secretary; F. J. Stilson and Charles Gildmacher.

## SAN DIEGO COUNTY.

(From Our Special Correspondent.)

**Free Gold.**—The report of the receiver of this mine (formerly known as the Golden Cross), at Hedges,



shows for December receipts of \$21,248, and disbursements of \$23,477. In addition there were estimated receipts from mill and cyanide plant of \$15,570.

SAN LUIS OBISPO COUNTY.

**American Exploration and Development Company.**—This company states that it has been developing a group of 5 quicksilver claims near San Simeon for 2 years and has spent over \$50,000. The principal workings are tunnels. A small reduction plant is producing some quicksilver and may be enlarged. The ledge is said to be from 50 to 60 ft. wide. F. H. Cooper is president of the company, P. M. Baumgartner, vice-president; C. C. Cooper, secretary-treasurer, and M. Hoytema, manager.

**Paso Robles Quicksilver Mining Company.**—This company has been organized at Paso Robles by C. Seideman, A. Pfister, O. E. Never, L. G. Sinnard and J. D. Armstrong. The company is to develop a group of quicksilver claims in Adelaide district.

SIERRA COUNTY.

(From Our Special Correspondent.)

**Swansea.**—J. Broek and others have resumed work on this mine at Chipp's Flat.

**Thistle Shaft.**—At this mine, owned by the Feather Fork Gold Mining Company, at Gibsonville, C. B. Wingate, manager, a 5,000-ft. drain tunnel is in 1,500 ft. The men are making about 70 ft. weekly. This drift mine is one of the few in the State to work by shaft instead of tunnel, and was a large producer for some years. A few years since water compelled a shut down, and it was decided to run a tunnel.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

**Ball.**—At this mine, near Rollin, the ore is averaging \$10 per ton. Of a Fraser & Chalmers' 20-stamp mill, with 6 concentrators, but 10 stamps are dropping owing to lack of water.

**Dewey.**—At this mine, belonging to the Squaw Creek Mining Company, at Gazelle, W. A. Monroe, superintendent, the mill is being overhauled and repaired. The mine has been shipping ore to the smelters at Keswick.

SONOMA COUNTY.

(From Our Special Correspondent.)

**Cinnabar District.**—T. F. Bachelder, of San Francisco, has filed at Santa Rosa on 18 claims in this district. A number of claims have been located by others.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

**Eagle-Shawmut.**—At this mine, at Chinese Camp, over 200 men are placing the machinery at the new mill, which, when completed, will have 200 stamps. The mine belongs to John Rosenfeld's Sons, of San Francisco.

**Hope.**—The 10-stamp mill and underground work have started at this mine, near Sonora, owned by Samuel Ralston.

**Mohican.**—This mine, near Carters, under the superintendence of F. Chapelet, Jr., is shipping bullion from ore averaging \$20 to the ton. The 5-stamp mill is driven by a gasoline engine.

**Rough and Ready.**—A tunnel, now in 950-ft., is being run at this mine, near Chinese Camp, under supervision of H. S. Scott.

**Snowflake.**—Exceptionally high-grade ore is reported taken from the 70-ft. shaft of this mine, near Confidence.

**Star.**—This mine, near Columbia, is to again start under the superintendence of Mr. Olsen.

**Wild Cat.**—The 5-stamp mill at this mine, near Confidence, is ready for work.

TULARE COUNTY.

(From Our Special Correspondent.)

**Powell.**—F. M. Powell and others, of Hanford, are opening a copper mine on Middle Tule River. They will ship by pack train to Porterville, thence by rail to San Francisco.

COLORADO.

BOULDER COUNTY.

(From Our Special Correspondent.)

**Boulder Oil Field.**—Speculation is still active over this oil field. Conservative investors await actual determination of the capacity of the only 2 wells at present in operation. The Arnold well as yet seems hardly to have reached a safe basis of estimate notwithstanding repeated pumping tests; careful commercial tests show the oil of the Arnold well to contain about 15 per cent of naphtha and the more volatile products, and fully 50 per cent of illuminating oil.

**Colorado & Northwestern Gold Mining Company.**—This company has run a tunnel into Sugar Loaf Mountain over 2,000 ft., and intends to tap many of the productive veins of that district.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

**Detroit Reduction Company.**—Land has been purchased at Idaho Springs for a 100-ton concentrating mill. Within 30 days ground will be broken and the works are expected to be completed within 3 months after. The entire capacity has been contracted for. T. B. Carr will be superintendent.

GILPIN COUNTY.

(From Our Special Correspondent.)

**Mining Transfers.**—Thomas J. Oyler to L. Sternberger, the Centennial lode in Russell District; P. Rohling to E. M. Baldwin  $\frac{3}{4}$  interest in Everett lode in Gregory District; D. O'Sullivan to J. E. Dougherty 1-2 interest in Eureka and Phoenix placers in Central District; Pennsylvania Mining Company to S. J. Jones easterly 700 ft. on Shamrock lode in Russell District; J. E. Duval to W. E. Garver 1-3 interest in Iron lode in Wisconsin District; E. J. Stephenson to J. E. Dougherty 3-8 interest in Head Lump Gulch placer in Central District; L. A. Duffield to F. C. Augustus the Policy placer in Pine District.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

**Leadville Ore Output.**—January output of all classes of ores amounts to something over 60,000 tons. The iron producers furnished the bulk of this. The Midas took out 7,000 tons, Greenback 5,000, Iron-Silver (Moyer) 4,000, New Home Company 8,000, Phoenix Company 4,000, Coronado 2,000, Caribou 5,000, while the principal siliceous producers were the Ibox, Resurrection, Penn, Deer, Chippewa, Winnie, Big Six, South Winnie and Yak.

**A. M. W. Company.**—The lead product has been reduced to about 15 tons a day. About 50 tons a day of zinc are produced. Disagreement over prices with the smelter caused the curtailment of lead shipments.

**A. Y. & Minnie.**—The new lessees have taken possession. The mill is to be enlarged so as to save a zinc concentrate. E. L. Newhouse, one of the western directors of the American Smelting and Refining Company is at the head of this new lease.

**California Gulch Mining Company.**—More funds are needed to carry ahead the work stopped when the company became involved. An effort is being made to raise \$5,000, and if this is not done the lease will be forfeited.

**Caribou Mining Company.**—This company is developing a strong oxidized iron shoot and shipping 200 tons a day.

**Catalpa-Crescent.**—Sub-lessees are shipping 75 tons a day of good oxidized iron.

**Cloud City Mining Company.**—Besides opening up a manganese body in this new downtown shaft which can furnish 100 tons a day the company is exploring at 500 ft. A winze is being sunk.

**Graham Gulch Mining Company.**—Articles of incorporation just filed show a capital stock of \$100,000 with J. M. Maxwell, Andrew Dyatt and G. H. F. Meyer as incorporators. The company is sinking a deep shaft on the old Star of the West group on Iron Hill slope of Graham Park. The shaft is to go down 500 ft.

**Hap Hazard.**—This new leasing company is sinking to cut the veins opened in the upper workings. A fine new plant of machinery is in place and a new mill will likely be built next summer to handle the low grade free milling quartz.

**Ibox Mining Company.**—The contract allowing the Yak tunnel to extend into Ibox territory a distance of about 1,200 ft. will probably be closed soon. Company work continues through 2 shafts and shipments average 150 to 200 tons a day. The company could ship 500 tons a day if it had a market for its low grade siliceous ores.

**Iron-Silver Mining Company.**—Through the Moyer shaft shipments have increased to 200 tons a day of iron sulphides. The mill is running well and turning out a good concentrate.

**Morocco Mining Company.**—In the new A. V. shaft the company has caught the southwesterly continuation of the Bon Air shoot and is opening up some good iron ore from which occasional shipments are made.

**New Elkhorn Mining Company, Limited.**—Walter S. Kelley is carrying on development work for the company through the New Elkhorn shaft between the 400 and 500 ft. levels. The drifts are following a body of ore not yet of commercial value.

**New Leadville Home Mining Company.**—The directors have decided to pay dividends quarterly instead of monthly. The first quarterly dividend will be paid in April. A large amount of promising development work is being done and shipments average 250 tons a day of good iron ore.

**Printer Boy Gold Mining Company.**—All legal difficulties have been settled and the company is rapidly unwatering the old Litter shaft preparatory to sinking to the lower contacts.

**South Winnie Leasing Company.**—A new ore body

is being opened at the lower level and shipments average 10 tons a day of good grade gold ore.

**Two Bit Placer.**—Denver parties have this 100-acre tract and a steam shovel and other machinery has been ordered. The bond is for \$25,000.

MESA COUNTY.

(From Our Special Correspondent.)

**De Beque Oil Field.**—The commercial value of the De Beque oil wells or the quantity that can be relied upon is not determined yet, but the oil has a distinctively paraffin base. It differs much in this particular from that of other Colorado districts.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

**Mining Transfers.**—George E. Collins to Jacob Filius, Sheba lode; Michael Heiser to W. B. Boardman, Buckeye et al. lodes; Anna Page to Jas. H. Robin et al, American Boy lode; W. B. Boardman to the Freeport & Cripple Creek Gold Mining Company, Buckeye, et al. lodes; Hugh Butler to Henry T. Rogers, North Star lode; Gold King Consolidated Mines Company, to B. O'Driscoll, Standard lode; James Clifford to James Lewis, Three Guardsmen et al. lodes.

**Alpha Mining and Milling Company.**—A special meeting will be held at the Grand Hotel in Silverton on February 12 for the purpose of electing 5 directors.

**Aztec Gold Mining and Milling Company.**—A 12 h. p. gasoline engine has been installed on this property in the Needle Mountains. The tunnel is in 600 ft. and air drills are being put in.

**Cave-Livingstone.**—A good body of ore has been found in this Silverton property and preparations are being made to put on a large force. New bins will be built at once and shipments will follow.

**Esmeralda.**—The tunnel near Silverton being driven by contractors is nearing completion. A sale is pending to an eastern syndicate.

**Galty Boy.**—An upraise is to be run on the vein and shipments will soon begin. Copper is showing in the lower workings.

**Gold King Consolidated Mines Company.**—The lower cross-cut of this Silverton property recently encountered a large vein.

**Ice Lake Basin.**—An English company, represented by J. M. Callow, has taken an option on a number of properties in this district. A 200-ft. shaft is to be sunk at once on the Grand View and a 600-ft cross-cut will be run to cut the Last Hope vein. A mill will be erected in the spring.

**Lackawanna Group.**—George Whitelaw, owner of this group on Blair Mountain, is now in New York City organizing a company. A tunnel will be driven near the level of Animas River to tap the vein at depth.

**Lion Tunnel.**—Air drills are abandoned for the present owing to lack of water-power and the tunnel is being driven by hand.

**New York & Brooklyn.**—This tunnel is now 400 ft. in on the vein and the ore has lately increased to shipping grade.

**Oliver Reduction Company.**—This company will erect a 400-ton mill about 2 miles above Silverton for treating Henrietta ore. E. W. Walter has been appointed superintendent of construction and will also manage the mill.

**Royal Mining Company.**—This company, operating the King group about 3 miles below Silverton, has temporarily suspended operations pending the installation of a 4-drill compressor. A tunnel is being driven under the old workings, which will tap the vein at 700 ft. The tunnel is now in 300 ft. and has 630 ft. to go.

**Silver Lake.**—The new mill near Silverton is being overhauled for experimental purposes, some new machinery is being put in.

**Sunnyside.**—Work on a large addition to the mill near Silverton will start by February 10.

**San Juan Fleecce Gold Mining Company.**—The annual meeting is set for February 12, at the company's office.

SAN MIGUEL COUNTY.

**Japan.**—The recent agreement between the mine operators and the Miners' Union does not seem to avert strikes. At this mine the muckers or shovelers have helped the machine men at odd moments and whenever needed. They were paid 50c. a day extra for this. The regular rate for muckers is \$3 a day. The union classed these men as machine men and demanded that they be paid \$4 a day. The miners struck and the strike was settled by the muckers returning to work at \$3 a day, without the opportunity to earn extra money. It means a loss of 50c. a day to the muckers, nothing for the union, but puts the company to an extra expense or loss of time in driving its tunnel.

**Smuggler-Union Mining Company.**—This company, after having replaced the burned buildings and upper

terminal of the lower tramway at the Bullion tunnel, near Telluride, is operating at full capacity, the tramway bringing down 450 tons of ore per day. At present there are on the pay roll 430 men, 350 of whom are employed in the Smuggler Mine, the rest at the mills at Pandora.

The mills are turning out from 3 to 4 cars of concentrates per day. The new cyanide plant is running at full capacity—500 tons of tailings per day.

At the Contention Mine about 80 men are employed, the tramway steadily supplying ore, which is reported to give very satisfactory results, to 30 stamps in the old mill at Pandora.

Wearing & Kelly, leasers on the Sheridan, are shipping 8 to 10 cars of high grade gold ore per month.

#### TELLER COUNTY.

**Economic Mill.**—This mill, in Eclipse Gulch, has temporarily closed to permit extensive improvements and additions. These will consist of raising the roasters and coolers to correspond to the capacity of the barrels and rolls, giving the mill a daily capacity of 325 tons. The concentrator room will be moved lower into the mill building, and the floors will be rebuilt. A dust collecting scheme will also be introduced. The improvements will be completed by February 20.

**Doctor-Jack Pot.**—The big station pump in the Morning Glory shaft is raising 1,500 gals. of water a minute. At the present rate of pumping the management expects to have the Doctor-Jack Pot workings and the properties operated through the shaft, thoroughly drained by March 31. The pump is the largest now in use in the camp.

(From Our Special Correspondent.)

**Taylor & Brunton Sampler.**—This plant being erected at Gold Fields, will have a daily capacity of 600 tons. The building is completed and the mill is expected to be in operation by May 1.

#### GEORGIA.

##### FANNIN COUNTY.

**Ranz Hill Mining Company.**—This company has bought a boiler and other machinery for use at the mine. Mr. George E. Towns, president of the company, has charge of operations.

##### LUMPKIN COUNTY.

**Stegall.**—Messrs. Bud Odom and Bony Tank, who are operating as lessees on this property, recently opened up a pocket carrying high values in gold. Its extent is not yet determined.

#### IDAHO.

##### CUSTER COUNTY.

**White Knob Copper Company, Limited.**—The company recently increased the membership of the Board of Directors to 9, electing Wilbur K. Mathews, Charles B. Van Nostrand, William L. Stow, Edward C. Platt, A. Cass Canfield, Henry J. Luce, Charles G. Funk, George J. Smith and J. Reginald Foster. The board elected the following officers: President, Henry J. Luce; vice-president, Wilbur K. Mathews; treasurer, Charles B. Van Nostrand; secretary, Charles G. Funk, and assistant secretary and assistant treasurer, Austin M. Poole. The officers of the company estimate that in addition to the sum of \$160,000 already expended in excess of the original estimates an additional sum of \$140,000 will be required to place the property upon a producing basis free of all obligations. The company holds substantially all of the capital stock of the White Knob Copper Company of West Virginia, which is now in process of liquidation, and, as such stockholders, are entitled substantially to all the assets.

##### SHOSHONE COUNTY.

Cold weather in the Coeur d'Alenes has greatly affected work at the concentrating plants. Ice formed in flumes and about the mills. The Mammoth shut down several days as did the Bunker Hill & Sullivan. Late advices report warmer weather and the plants are resuming work.

#### ILLINOIS.

##### FRANKLIN COUNTY.

According to a press despatch, Joseph Leiter, of Chicago, has purchased about 6,000 acres of land in this county, paying for it over \$200,000. He will let a contract for a railroad from Benton, a distance of 12 miles. Two shafts will be sunk with a capacity of 15,000 bushels of coal each day. The output will be burned into coke. Twelve hundred men will be employed at the start. A city has already been laid off in the forest and named Ziegler.

#### MICHIGAN.

##### COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

The recent blizzard interfered with surface work at the mines and several mills ran with a reduced

number of heads. Work on the new stamp mills, where uninclosed, was suspended during the storm.

**Arcadian.**—The local management is conducting affairs in a small way, selling surplus supplies and unnecessary machinery and employing a small force.

**Baltic.**—Men are finishing the new mill and it is thought that another head will be installed for the use of the Champion Mine.

**Centennial.**—The concrete foundation of the stamp will be rebuilt. The Nordberg Manufacturing Company, of Milwaukee, Wis., has men at work installing the new hoist at A shaft.

**Globe.**—This property, one of the most important undeveloped in the district, will be explored next summer for the Baltic lode.

**Rhode Island.**—Recent reports state that the Alouez conglomerate lode, encountered recently by a cross-cut from No. 2 shaft at the 5th level, is opening up well. The company employs a small force.

**St. Mary's Canal Mineral Land Company.**—This company owns a large tract of land south of Portage Lake and next summer portions supposed to carry the Baltic amygdaloid lode will be explored.

##### COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

**Mohawk.**—The mill on Traverse Bay is progressing well and will be ready for machinery soon.

##### COPPER—ONTONAGON COUNTY.

(From Our Special Correspondent.)

**Belt.**—Nathan F. Leopold, of Chicago, representative of Standard Oil interests, has surrendered his option and all exploratory work will stop owing to the present unsatisfactory condition of the copper market. The mine was taken under option early in 1901 and was at once unwatered. The 75 men employed have been discharged and supplies and machinery not belonging to the owners will be removed. The Belt was last worked by an English company.

#### MINNESOTA.

##### IRON—MESABI RANGE.

(From Our Special Correspondent.)

**Explorations.**—E. J. Longyear is operating about 45 drills on the range, churn and diamond, and employs more than 200 persons. His operations are directed from Hibbing. This is a larger exploring business than has ever been carried on in Minnesota by any exploring firm or mining corporation. The Cole & McDonald Exploring Company recently incorporated, employs a large force and operates about 35 drills, the Donora Mining Company runs 3, Gustav Swenson, and other small contractors operate 2 or 3 each, and several individuals carrying on explorations on their own lands have from 1 to 3 each. It is probable that not less than 125 drills are now operating in the Mesabi Range. The Minnesota Iron Company runs 8 drills, all diamond, about the hard ore mines at Soudan, Vermillion Range, and the Mahoning Ore and Steel Company is drilling with 2 machines between Soudan and Ely.

**Arcturus.**—Some ore has been hauled by team to the railroad, and will be shipped to furnaces in Kentucky to test some method for the elimination of free silica. It is claimed that if the method proves successful the mine and a lot of surrounding land will be sold. The price is put at \$600,000.

**Interstate Mining Company.**—This company, the mining branch of Jones & Laughlins, claims to have ore at its new Lincoln Mine and elsewhere on the Mesabi Range amounting to 30,000,000 tons. The Lincoln is under exploration and development. A diamond drill hole is 85 ft. in high grade ore, most of it running above 64 per cent and low in phosphorus. The ore body on the Lincoln is 750 ft. wide, runs clear across one 40-acre tract, and is at least 1,500 ft. long. The company has also the Columbia, which is a small property near the Lincoln, containing about 4,000,000 tons; and the Grant, a State lease, the fee of which is in the State school fund, and that is explored to show 10,000,000 tons. This ore body is a westerly continuation of the Sharon. A small amount of Grant ore taken to Aultsburg for examination is considered excellent. The Columbia is idle, but both the Lincoln and Grant may be worked the coming year, the former heavily. The company paid an enormous price for these properties, but events have to a certain extent justified the purchase.

#### MONTANA.

##### BEAVERHEAD COUNTY.

(From Our Special Correspondent.)

**Indian Queen.**—Ricketts & Banks, of New York City, who have been operating this Birch Creek property on a lease and bond under the management of Capt. S. J. Dennis, have surrendered the option, not being able to make satisfactory arrangements for an extension of time. The machinery placed on the mine has been removed and shipped to Butte. Captain Dennis still retains options on some other properties

in the neighborhood belonging to Geo. Jewell, of Dillon. The option on these calls for \$20,000 in payments.

##### FERGUS COUNTY.

(From Our Special Correspondent.)

**Central Montana Mines Company.**—The company's affairs having been adjusted by agreement among the litigants, Judge Knowles, of the United States Court, has discharged the receiver, who has been operating the property for several months. C. C. Bragg, of Cincinnati, O., has sold his holdings in the company and resigned the presidency. A new set of officers has been elected in St. Paul. It is claimed that under the management of Receiver Wright the cyanide mill at Spotted Horse ran with indifferent success for some months.

**North Moccasin Gold Mining Company.**—This company has incorporated with \$2,500,000 capital. The incorporators are: J. D. Waite, F. E. Wright, W. C. Waldorf, W. C. Draper, A. H. S. Bird, A. S. Wright and A. W. Warr, the latter acting as secretary.

The Waldorf, Draper and Riser properties situated between the Kendall group and the King-Barnes Mines have been deeded to the corporation by J. D. Waite. Development will be pushed, and a mill may be erected in the spring.

##### FLATHEAD COUNTY.

(From Our Special Correspondent.)

**Montana Land and Oil Company.**—This company, composed of Helena men, has filed articles of incorporation to work in the Kintla Lake oil region. The directors are: A. H. Barrett, Henry Klein, H. M. Parchen, R. C. Wallace, L. A. Walker and F. H. Ray. The capital stock is \$300,000.

**Northern Montana Oil Company.**—This is another Kintla Lake Company, with a capital of \$2,500,000. The incorporators are: J. McIntire, H. C. Keith, J. H. Stevens, B. J. Schagel, of Kalispell, and W. O. Dutton, of Spokane. Kalispell is named as the principal place of business.

##### GRANITE COUNTY.

(From Our Special Correspondent.)

**Sunday.**—H. C. Mecham, who has been quietly developing this gold property for some years, has made a deal with Butte men, who have secured it under bond and lease at \$20,000, with a cash payment down. It is claimed that Mr. Mecham has 5 ft. of free-milling gold ore opened up. The mine is situated about 10 miles from Flint Station, adjoining the Royal Gold. This property has had a 10-stamp mill in operation some years. This formerly was considered very profitable.

##### JEFFERSON COUNTY.

(From Our Special Correspondent.)

**Bluebird.**—Jenkins Bros., who are operating this property, near Wickes, are shipping 2 cars a week to Tacoma, and have 3 ft. of carbonate ore. One 4-horse team makes 2 trips daily between the railroad and mine. The bond on this property is for \$30,000.

**Comet and Rumely.**—These old properties, situated at Comet, are under operation by Stuart & Johnson. The Comet is the property of the Helena & Livingston Smelting Company. The Rumely is owned by the Holters of Helena. Both are silver-lead, and in the active days of the old Wickes Smelter were big producers. The first aerial tramway ever erected in the state was put in operation from the Comet mine to the foot of the hill.

**Eva May.**—New ore bodies being opened in the lower workings of this property 7 miles from Basin are of sufficient size, it is thought, to keep the concentrator fully supplied. The mill has been idle since late last summer, but is now being overhauled. Two Overstrom tables will be added to the equipment.

**Penn Yan.**—This property, under bond to Hammel & Edwards, situated 4 miles from Wickes, is shipping a car per week of carbonate ore to Tacoma.

##### LEWIS & CLARKE COUNTY.

(From Our Special Correspondent.)

**Missouri River Power Company.**—Cold weather has retarded the work on the transmission line to Butte, so that it was not possible to deliver power on February 1, as was intended.

**Spokane & Montana Mining Company.**—This concern operating at Rimini under the management of J. E. Jackson, is to install a compressor plant purchased from the Butte agency of the Rand Drill Company.

**Exploration and Mining Company of Helena, Montana.**—This company, with a capital stock of \$1,000,000 in \$100 shares, has been organized to develop mines near Helena. The incorporators are: B. H. Tatem, of the United States Assay Office; F. S. P. Lindsay, E. C. Babcock, Sherwood Wheaton, N. J. Gould, Henry Sieben, C. C. Newman, T. C. Kurtz and S. T. Hauser, of the Helena & Livingston Smelting and Refining Company. The office of the company will be in Helena. The directors for the first 3



months will be: N. B. Holter, N. J. Gould, C. W. Whitley, A. H. Barret, S. T. Hauser, George E. Gunn, T. C. Kurtz, C. C. Newman, Frank S. P. Lindsay, Sherwood Wheaton and Henry Sieben.

**POWELL COUNTY.**

**Washoe Smelter.**—Power has been turned on at the new Washoe Smelter of the Anaconda Company, at Anaconda, and the mammoth plant is treating ore from the Mountain Con Mine at Butte.

**SILVER BOW COUNTY.**

**Amalgamated Copper Company.**—There has been material increase in the force of miners employed at the mines of the Anaconda Company and the Boston & Montana Company. The Never Sweat Mine has been opened and work is resumed in the St. Lawrence.

**Anaconda Mining Company.**—Judge Clancy has granted F. Aug. Heinze a second order for an inspection of the Anaconda Mine. The first order was in connection with the Fairmount Claim, the second is about the Belmont Claim proceeding to determine the underground relations of the Belmont and the Anaconda Company's operations. The Anaconda Company will appeal to the Supreme Court.

**Boston & Montana.**—The State Supreme Court has modified the injunction issued last April by Judge Clancy, enjoining the company from working in the Gambetta and Piccola mines on the ground that the company was working a vein of the Minnie Healy Mine through a shaft of the Leonard Mine. The effect of the injunction was to stop all work in the Leonard, 300 men having been laid off. The Supreme Court modified the injunction so that it does not apply to the Leonard Mine, but holds as to the Gambetta and Piccola. The court said there is evidence to show that the Leonard vein has its apex or cone nearer to the surface in Boston & Montana ground.

**MISSOURI.**

**JASPER COUNTY.**

(From Our Special Correspondent.)

**Joplin Ore Market.**—There has been an advance in both lead and zinc ore, and the market is exceedingly strong. Bad weather caused many unprotected mines to shut down. Much of the zinc ore sold was produced during the preceding week, and the sales of the past week will doubtless cause the surplus to diminish considerably. Zinc ore advanced 50 cents per ton for high grade ore, but the lower grades remained about stationary. Lead ore advanced 75 cents per 1,000 lbs., but the ore output was exceedingly small during the past week, as the shallow mines were closed by disagreeable weather.

The highest price paid for zinc ore was \$30 per ton, upon a straight bid. Lead ore brought \$21.75 per 1,000 lbs. delivered. During the corresponding week of last year lead ore brought \$22.50 per 1,000 lbs., and zinc ore sold for \$27 per ton.

During the corresponding week of last year the zinc ore sales were 170 tons less, and the lead ore sales 190 tons more than during the past week.

Following is the turn in by camps of the Joplin District for the week ending February 2:

	Zinc. lbs.	Lead. lbs.	Value.
Joplin	2,374,599	282,790	\$46,395
Galena-Empire	1,460,260	91,310	20,677
Cartersville	1,959,980	156,180	28,877
Oronogo	755,010	29,670	10,778
Aurora	563,820	26,280	7,478
Neck City	416,210	...	5,827
Webb City	499,050	4,550	6,618
Carl Junction	329,250	...	4,610
Zincite	294,820	...	4,127
Duenweg	322,060	35,420	4,674
Roaring Springs	262,310	5,650	3,533
Carthage	310,960	...	4,354
Stotts City	248,060	...	3,473
Spurgeon	226,150	49,160	3,783
Cave Springs	178,600	4,040	2,588
Central City	127,330	1,870	1,769
Granby	66,000	18,000	970
Sherwood	61,740	...	834
Total	10,956,210	704,920	\$161,365
Total since Jan. 1	52,203,440	6,116,600	\$826,543

Zinc ore value, \$146,321; lead ore, \$15,044.  
Zinc value since Jan. 1: \$596,064; lead, \$130,479.

**NEVADA.**

**WHITE PINE COUNTY.**

(From Our Special Correspondent.)

**Chairman Mining and Electric Company.**—Developments on an extension of the 200-ft.-level have opened large bodies of medium grade ore which prove the continuity of the vein in paying values. The drift is in ore 150 ft.

**Ely District.**—On February 1 many of the bonds on outlying and detached claims expired. A promoting company of New York parties has bonded about 50 claims at an aggregate bonding value of \$400,000, to be used in forming another stock-jobbing company. The claims are practically undeveloped, with one or two exceptions, and the bondholders have made no effort to determine values by exploration. A meagre amount of development in some of the more prominent properties is evidently to be taken as a foundation for extraordinary claims.

**New Century.**—This mine, owned by P. H. Cannon, of Cherry Creek, is producing some rich silver ore. Developments consist of a tunnel 400 ft. long, a 100-ft. winze, and 50 ft. of drifting at the foot of the winze. Two veins, from 10 to 18 ft. wide, occur on either side of an intrusive dike of granite about 100 ft. wide. The country rock is quartzite, and the vein matter quartz carrying from small values to 200 to 400 oz. silver and \$1 in gold to each 10 oz. silver. The rich shipping ore occurs apparently along fault planes in the vein. The mine is an extension of the Exchequer Mine, which was a rich producer of silver and gold in the '70's. Shipments of 30 tons are being made that will average \$250 per ton. The ore goes to the Salt Lake smelters.

**Glasgow & Western Company.**—This company, consisting of Glasgow, Scotland, men owns the Star Mine equipped with a 60-ton concentrating mill. The property is not working, though 8 men keep the pumps running and the mine safe. The ore carries sulphides of silver, ruby silver, argentiferous galena, and some horn silver. The vein averages 10 ft. wide and has been opened to a depth of 700 ft.

**NORTH CAROLINA.**

**GUILFORD COUNTY.**

(From Our Special Correspondent.)

**Fentress.**—This gold and copper mine, situated about 5 miles south of Greensboro, is operated by the Center Gold and Copper Company, of Kingston, N. Y., of which Mr. Bruyn is president. On February 1 Dr. A. R. Ledoux, of New York, began an examination of the mine.

**ROWAN COUNTY.**

(From Our Special Correspondent.)

**Union.**—This smelter has blown out pending enlargement of plant. The mine is down 500 ft. and continues to produce copper-gold ore, while opening new bodies in the lower levels. Capt. W. Murdock Wiley, the new manager, is putting the mine in shape to supply the additional smelting plant that will be erected at once.

**RUTHERFORD COUNTY.**

(From Our Special Correspondent.)

**Monarch.**—This gold mine, near Itom, is operated by J. W. Johnston, of Arizona. The ore is quartz with free gold and auriferous pyrites. The main shaft is down 150 ft. and equipped with a steam hoist. The mill consists of a 5-stamp and concentrator. Several car-loads of concentrates are ready for shipment.

**OHIO.**

**BELMONT COUNTY.**

Capt. Alfred Hicks, of Pittsburg, and Thomas K. Maher, of Philadelphia, have closed a deal for 8,000 acres of coal land for a sum reported close to \$1,000,000. The property adjoins the De Armit Coal Company's workings, and has 3 mines now in operation. The property will be developed as rapidly as possible. The Baltimore & Ohio, Cleveland, Lorain & Wheeling, and Washab Railroads traverse the tract. J. P. and C. W. Troll of St. Clairsville, Ohio, representing the Black Diamond Coal Company, the Ohio & West Virginia Coal Company, and the Echo Coal Company negotiated the sale.

**HOCKING COUNTY.**

**Greenedale Company.**—This company, which recently sold out to the Pittsburg Coal Company, has Thomas King, of Boston, as president and C. H. Boardman, of Columbus, secretary and treasurer and resident manager. It operates about 1,000 acres of coal near Murray City. The capital was \$200,000.

**New Pittsburg Coal Company.**—This company's 8 mines and other property in the Hocking Valley were recently purchased by the Pittsburg Coal Company. The New Pittsburg Company retains its corporate powers and privileges.

**TUSCARAWAS COUNTY.**

**Massillon-Tuscarawas Coal Company.**—This company was recently incorporated with \$18,000 capital by James Corns, Harry T. Beatty, David Johns and Richard W. Johns, of Massillon, and J. C. Goff, of Cleveland. The company has 200 acres of coal land, and has options on another tract of 1,000 acres, both lying between New Cumberland and New Philadelphia. The work of opening one of the smaller tracts will begin about March 1. The territory is 3 miles from the Wheeling & Lake Erie Railroad, from which a switch will be built.

**PENNSYLVANIA.**

**ANTHRACITE COAL.**

**Lehigh Valley Coal Company.**—This company makes the following statement for December, the first month of its fiscal year:

	1900.	1901.	Changes.
Earnings	\$2,025,286	\$2,041,661	I. \$16,375
Expenses	2,062,330	2,052,899	D. 9,431
Net loss	\$37,044	\$11,238	D. \$25,806

The earnings include income from all sources.

**Packer Colliery No. 4.**—This colliery of the Lehigh Valley Coal Company, at Shenandoah, after being idle 3 months, has resumed work, giving employment to 800 men and boys.

**Preston No. 2 Colliery.**—The water in this colliery is still 165 ft. up the slope, and little headway seems to be made in getting it out. The colliery may be idle for some time. The plant employs 500 hands.

**BITUMINOUS COAL.**

**Allegheny Coal Company.**—This company has sunk shafts about 250 ft., and is starting to open the vein. A branch to the West Penn road has been built. The company owns 4,000 acres near Cheswick, close to 9,000 acres recently purchased by the Midland Coal Company, of Pittsburg. The Allegheny Company is composed principally of Cleveland, O., men. Parks Foster, of Elyria, O., is president and U. C. Hatch, secretary.

**Black Lick Coal Mining Company.**—This company's mines at Expedi, Cambria County, are known as the Twin Rocks. The output is 800 tons daily. The property belongs to the McFadden estate, and Charles McFadden, Jr., is active manager.

**Logansport Coal Company.**—This company organized recently by Pittsburg men, has begun operations at Logansport. Robert C. McLean, of Pittsburg, is president. The company proposes to build a well-equipped brick plant in the spring. Besides owning a large acreage of coal, the company has acquired over 200 acres of surface with clay that is reported excellent for fire brick.

**Hocking Coal Company.**—This company has started to open its mine on the Baltimore & Ohio Railroad. The mine will be operated entirely by machinery and will have electric haulage.

**Moss Creek Coal Field.**—It is stated that the deal for the purchase of the entire coal field along Moss Creek has been completed. The sellers are Gen. Daniel H. Hastings and Col. J. L. Spangler, of Bellefonte, with others who have transferred their interests to a syndicate of New York men. The transfer includes 5,000 acres of coal lands along Moss Creek and the consideration is about \$100 an acre, or \$500,000. It will be necessary to construct a railroad 4 miles long to reach the point of development.

**Somerset Coal Company.**—This company has been organized with a capital of \$4,000,000. It is understood that the new corporation has taken possession of the following properties: Cumberland & Elk Lick Coal Company, Duncombe Mine; Cumberland & Summit Coal Company, Althouse mines, at Allegheny and Pomphigh; Enterprise Coal Company, Casselman Coal Company, Listie Coal Company, Pine Hill Coal Company, Stuart Coal Company, Tub Mill Mine, Chapman Mine, Wilmoth Mine, Thomas Mine and Wilson Creek. These properties are all located on the Baltimore & Ohio Railroad, in Somerset County, and have an aggregate yearly tonnage of 1,500,000 tons.

The officers of the company are C. W. Watson, president; J. T. Gardiner, vice president, and W. G. Sharp, treasurer. The directors are Walter G. Oakman, August Belmont, W. H. Baldwin, Jr., Acosta Nichols, J. H. Wheelwright, W. G. Sharp, George W. Young, Charles T. Barney, James T. Gardiner, D. B. Zimmerman, Frank Ehlen and C. W. Watson. The general offices of the company will be at No. 1 Broadway, New York City.

**SOUTH DAKOTA.**

**CUSTER COUNTY.**

(From Our Special Correspondent.)

**Clara Belle.**—The directors, at a recent meeting, set aside 50,000 shares of treasury stock for development purposes. The new shaft is complete, and a stamp mill will be purchased to take the place of the Tremaine mill. The mill is making regular clean ups.

**Goldfish Mining Company.**—This company has its second shaft down 75 ft., and a drift is being run to connect with the other shaft. The company's property was formerly called the Salmon.

**National Mica Company.**—Articles of incorporation have been filed by Charles A. Dow, Alfred F. Feay and Beotious Sullivan, with \$1,000,000 capital, to work mica mines.

**LAWRENCE COUNTY.**

(From Our Special Correspondent.)

**Boston-South Dakota.**—A cyanide annex is being built at the Gustin-Minerva stamp mill in Blacktail Gulch. It will have a capacity of 100 tons a day. The tailings from the plates will pass through hydraulic classifiers. The mill has 40 stamps, and is receiving a new engine and boilers. The ore is a quartz conglomerate. Titus Corkhill, ex-State mine inspector, is in charge of the work.

**Clover Leaf Company.**—The shaft is 450 ft. deep. At 500 ft. a drift will be driven. The first consignment of machinery for the enlargement of the stamp mill has arrived. The foundation is finished, and the mill will have 60 stamps instead of 20 by April 1. The mill is running regularly.

**Hidden Fortune.**—The Baltic tunnel is 1,135 ft. long. A cross-cut to the west is in ore. Sinking is in progress on the ledge from the Spikane Tunnel.

**Horseshoe Mining Company.**—The Kildonan chlorination plant at Pluma is being converted into a cyanide mill with a capacity of 100 tons a day. It will be ready April 1. If the process is satisfactory the mill will be enlarged to 500 tons a day. The Horseshoe Company has contracted to furnish 200 tons of ore daily to the National Smelter at Rapid Cedar after April 1.

**Inter-Ocean.**—Work is to start in the spring after an idleness of several years. This property is in Bear Gulch District, and has a 20-stamp mill. The heirs of George Fisher are the heaviest owners.

## PENNINGTON COUNTY.

(From Our Special Correspondent.)

**Elizabeth Mining Company.**—The first clean-up has been made at the 40-stamp mill, which has been running since the first of the year irregularly. The tailings are being concentrated and shipped.

**Golden Slipper.**—The outstanding indebtedness, consisting of judgments and liens, has been settled by the Empire State Mining Company, which has a bond on the property. Ore is being milled. The shaft is being straightened and will be sunk deeper.

**National Smelting Company.**—The steel structure has been erected and is being covered with corrugated iron sheathing. The smelter will probably blow in April 1. It is said sufficient ore is contracted for to supply the plant over a year.

## TENNESSEE.

## POLK COUNTY.

**Ducktown Sulphur Copper and Iron Company.**—It is stated that an injunction has been granted against this company at Ducktown on account of sulphur smoke and fumes from the roasting plants. The president of the Tennessee Copper Company it is said, has notified the general manager of the company at Ducktown, that when the injunction is served he must shut off and close down the entire works and mines, pay off and discharge every man.

## WASHINGTON.

## FERRY COUNTY.

(From Our Special Correspondent.)

**Big Three.**—The company owns 3 claims in one group, on Iron Mountain, traversed by a quartz vein and a lateral vein. A shaft is down 60 ft. on the latter, with 4 to 5 ft. of quartz at the bottom. In sinking, the quartz assayed from \$4 to \$14 per ton. The shaft will be sunk 125 ft. expecting to intersect the big vein, which at the cropping assays from \$3 to \$9 per ton.

**Gold Hur.**—The tunnel shows 2 streaks of gold bearing quartz that assay from \$40 to \$100 per ton. The vein is 3 to 4 wide, with ore streaks from 3 to 12 in. wide.

**Wauconda.**—The 60 h. p. electric light plant is completed and work in the mine is resumed.

## PIERCE COUNTY.

**Tacoma Company.**—This company has been incorporated at Tacoma with \$25,000,000 capital, to erect blast furnaces and a steel plant. United States Senator A. G. Foster will be president, though not an incorporator. The incorporators are Henry Hewitt, partner of Senator Foster; A. M. Ingersoll, Charles W. Thompson, A. J. Hayward, and J. B. McIntire. It is announced that 2,000 acres of land, carrying in iron and limestone, have been secured by lease and purchase on Texada Island, and that the corporation has also obtained a large tract near Barclay Sound on Vancouver Island. Options have been obtained on iron lands in Skagit County, and the syndicate controls coal lands in this county.

Senator Foster and Mr. Hewitt control the Wilkeson Coal and Coke Company, operating mines and ovens at Wilkeson. A 400-acre site for plants has been secured on the Tacoma tide lands.

## WEST VIRGINIA.

## HARRISON COUNTY.

**Howard Coal and Coke Company.**—This company's property at Wilsonburg, as the result of disagreements among the stockholders has been sold to D. C. Williams, of Adamston, principal stockholder in the Perry Coal and Coke Company at Adamston and the Poos Coal and Coke Company near Lumberport.

The purchase price is said to be about \$100,000. Mr. Williams has taken possession and will put in machinery and make other improvements. The property consists of 800 acres of coal and 115 acres of surface, besides a tippie, coal cars, coke ovens, etc. The mines were opened about 25 years ago and the coal territory originally included 1,000 acres, but about 200 acres have been mined. Col. John Temple will probably be superintendent.

## KANAWHA COUNTY.

**Cabin Creek Kanawha Coal Company.**—At a recent meeting at Plymouth, Pa., J. J. Shonk, A. D. Shonk,

Ida E. Shonk and J. P. Pullock were elected directors. J. J. Shonk was elected president and A. D. Shonk secretary and manager.

## MARION COUNTY.

**Fairmont Coal Company.**—This company has recently completed 60 new coke ovens at Enterprise, and begun the making of coke. This is the first coke to be manufactured at that point.

## TAYLOR COUNTY.

**Monarch Coal Mining Company.**—This company recently organized under the laws of West Virginia, has bought the property of the Imperial Coal and Coke Company, comprising a large tract of developed coal land, tippie producing 300 tons a day, and mine equipment, at Victoria, on the main line of the Baltimore & Ohio, near Grafton. The new company has also purchased additional coal lands adjoining on which it has built a tippie. S. W. Schroeder, of the Tygarts Valley Coal and Coke Company, is president.

## WYOMING.

## CARBON COUNTY.

**Encampment Smelter.**—This plant recently treated 117 tons of ore in a day.

**Ferris-Haggarty.**—This copper mine, at Encampment, is again in operation producing 50 tons of ore per day. About 50 men are at work at the mine, and the Grand Encampment Transportation Company is hauling the ore to the smelter at Encampment on sleds, drawn by 4 horses each, down the mountains to the "transfer," from which it is hauled in 6-horse wagons to Encampment. Work on the long tunnel is progressing and will be completed by spring. It is now in between 800 and 875 ft.

**Southern Wyoming Tramway Company.**—This company is to construct an aerial tramway between the Ferris-Haggarty Mine and the Encampment Smelter.

## SHERIDAN COUNTY.

(From Our Special Correspondent.)

**Deater Mining and Development Company.**—This company organized at Sheridan with a capital stock of \$150,000, will develop mining property in the Wind River District.

**Grand Hope Gold Mining Company.**—This company has been capitalized at \$150,000 to operate in the Wind River country with headquarters at Sheridan.

## FOREIGN MINING NEWS.

## AFRICA.

## NATAL.

The Commissioner of Mines report for November shows that 2,275 men were employed in the coal mines underground and 1,127 on the surface; a total of 3,402, of whom 187 were white, 1,425 East Indians and 1,790 negroes. The coal production for the month was 46,371 tons, against 36,998 tons in November, 1900; showing an increase of 9,373 tons. The coal exported for the month was 3,633 tons; and 23,874 tons were sold to steamers in the port of Durban.

## TRANSVAAL.

The analysis of production in November prepared by the Transvaal Chamber of Mines, shows that 10 mines were at work and 554 stamps in use. There were 82,145 tons hoisted, of which 14,263 tons were waste, and 67,882 tons were crushed; the average mill duty being 4.65 tons per stamp per day. There were 52,410 tons tailings cyanided and 4,139 tons slimes treated. The total yield was, in fine gold: Mill, 25,686 oz.; cyanide, 11,332 oz.; slimes, 533 cz.; tailings and by-products, 1,525 oz.; total, 39,076 oz., or 0.58 oz. per ton crushed.

## AUSTRALIA.

## NEW SOUTH WALES.

**Broken Hill Proprietary Company.**—The statement for the four weeks ending January 1 shows that the refining output was 339,722 oz. silver, 4,213 tons lead and 18 tons hard or antimonial lead.

## QUEENSLAND.

The Mines Department reports the gold production of the State for November at 53,426 oz. crude, equal to 49,335 oz. fine gold. For the 11 months ending November 30 the total was 684,175 oz. crude, against 724,909 oz. for the corresponding period in 1900; a decrease of 40,734 oz., or 5.6 per cent. The production in 1900 was equal to 649,156 oz. fine gold, or \$13,418,054.

## TASMANIA.

**Mount Lyell Mining Company.**—This company reports 20,837 tons of ore smelted during the four weeks ending January 18. The yield was 786 tons of black copper, containing 777 tons fine copper, 48,787 oz. silver and 1,656 oz. gold. The average return was 3.73 per cent copper, 2.34 oz. silver and 0.08 oz. gold to the ton.

## VICTORIA.

The Mines Department reports the gold output for November at 69,550 oz. crude, equal to 48,112 oz. fine gold, against 54,318 oz. fine in November, 1900, showing a decrease of 6,206 oz. For the 11 months ending November 30, the total was 743,281 oz. crude, equal to 520,297 oz. fine gold, or \$10,754,539.

## BRAZIL.

The Government of Brazil has appropriated the sum of \$60,000 for the purpose of collecting and publishing information relating to the mineral production and resources of the country.

## CANADA.

## BRITISH COLUMBIA—ATLIN DISTRICT.

**Consolidated Spruce Creek Placers, Limited.**—This company states that it holds 16 concessions, covering 4 miles of placers along Spruce Creek in the Atlin District, also 2 water rights for 1,500 miner's inches of water from Spruce Creek and Little Spruce Creek. The company is capitalized at \$2,500,000 in \$1 shares, of which one-half is treasury stock. The company was organized under the laws of Washington, and its headquarters are at Seattle. The officers are: Chas. L. Denny, president; W. M. Brook, vice-president and general manager; Elbert Blaine, treasurer; Burton E. Bennett, secretary. The trustees are Chas. L. Denny; E. B. Burwell, Elbert F. Blaine, S. Frauenthal, W. M. Brook, Edmund Bowdin, and J. H. Cyaddis. A considerable amount of prospecting work has been done on the property, and it is estimated that there is a very large amount of gravel running 40c. per cu. yd., which by a proper equipment of ditches, pipe lines, grants and sluices can be handled at a cost of 10c. per yd.

## MEXICO.

## CHIHUAHUA.

**Dolores Mining Company.**—This company's mines at Dolores are reported shipping 75 tons of high grade gold ore monthly. An equal amount of lower grade rock is being stored, awaiting the construction of a mill. The first car load of rock from the property, shipped about a year ago, is said to have been the richest ever received at the El Paso Smelter. E. A. Stent, manager at Dolores, is considering plans for a mill.

(From Our Special Correspondent.)

Messrs. Clarke, Lawrence, Snyder and Foss, all of Chicago, Ill., representing the American corporation that recently secured power concessions on the Conchas River, with their representative, R. M. Burke, have been inspecting their interests. The dam is located at La Joya, about 45 miles northwest of Parral, and it is expected that the plant will be in running order and the wires run to Parral in 8 months. It is figured that the company will be able to lay power down at the different mines and mills for about half present cost.

**Las Adargas.**—Shipments from Jimenez to the smelter at Aguas Calientes during December were 1,000 tons, averaging 8 oz. silver, 2-10 of an ounce of gold and 35 per cent of lead. The amount received from the smelter is given as \$20,925 in gold; 150 men were employed. A new hoisting plant is being installed and other improvements made.

**Nueva Australia.**—F. W. Foster, who is interested here in the Guanacevi District, with associates, recently purchased this mine. The last clean-up gave 340 oz. silver and 1 1-2 oz. gold per ton; the daily output exceeds \$1,000. F. Gilpin, of Colorado Springs, Colo., is also interested.

**Palmillo.**—The electric hoist is in place and the large body of high-grade ore that was blocked out awaiting the arrival of this machinery will be shipped. The ore is said to run in the neighborhood of 425 oz. silver per ton, with considerable gold.

**Independencia.**—This and the Rayo and Morellos gold mines near Parral, are bonded to a large eastern syndicate for \$80,000 gold, with a cash 25 per cent payment.

**Los Remedios.**—This mine, the property of J. Brazon, is sold to the Compania Coahuilense (Madero Bros.).

**Parral Mines, Limited.**—F. Hawden, managing director of the Mesquite Mines in the State of Jalisco, is in Parral from London. He has formed 2 new companies and absorbed 2 adjoining properties. The new companies will be styled the Beckman Mines, Limited, and the Diaz Mines, Limited. The capital stock of the companies will be £30,000 each, which will be used in developing the properties.

**Vesper.**—This mine at Parral is sold to a Mr. Emerson, representing other Cripple Creek, Colo., capital.

## COAHUILA.

**Hondo.**—At this coal mine near Sabinas an explosion of dust on February 2 resulted in the death of over 110 men.



**MINING STOCKS.**

Complete quotations will be found on pages 232 and 233 of mining stocks listed and dealt in at:

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

**New York.** Feb. 6.

The copper group is again attracting attention; this time lower metal prices and a reported reduction in the Amalgamated dividend tended to depress stock prices. There is still much speculation as regards tactics of insiders. Profit-taking transactions were apparent when Amalgamated moved upward. On Monday this stock was up to \$78.75, resulting in sales of 116,700 shares, while on Wednesday, when the price had dropped to \$72.50, trading amounted to only 86,400 shares. In professional circles the next dividend of Amalgamated is being bought at 5-8 to 3-4 per cent. Last quarter the dividend was 1 per cent.

Anaconda in the first 3 days of this week receded from \$36.25 to \$33.25, on moderate dealings. On curb the coppers were feverish, Tennessee selling at \$15@ \$15 3-8, White Knob, of Idaho at \$16.75, and Union, of North Carolina at \$3.50. Efforts to interest the public in Montreal & Boston, of British Columbia, are still being made, and quotations of \$3 3-8@ \$3 1-2 for the \$5 par value shares are reported on curb. The supporters of Greene Consolidated of Mexico have run the price up to \$30.50 by offering little stock. At the close, however, bids of \$28.50 for Greene shares are heard.

Ontario Silver, of Utah, made sales at \$8.25@ \$8.50. Standard Consolidated, of California, brought \$3.50, seeming to hold at this figure whenever an offer to buy is put on the market. The stock is on a 4 per cent annual basis, carrying quarterly dividends of 10c. per share. Brunswick is less fortunate, selling today at 7c., the lowest price in some time. A sale of Quicksilver preferred is reported at \$10, a drop of 30c. since last week.

The Cripple Creek, Colo., favorites are in better request, owing to the heavy gold production and dividend payments in January. During that month 10 companies distributed \$639,651 on a total issued capital of \$16,425,035, the largest payers being Stratton's Independence (\$240,001) which is held principally in Great Britain, and Portland, (\$180,000). Sales of the latter are reported at \$2.50, which is a comparatively low price when we consider that the company pays 24 per cent annually on its capital of \$3,000,000. Elkton found buyers at \$1.28, and Isabella at 30c.

The Comstock stocks manifest little interest, as 6 companies have already levied \$51,020 in assessments to be collected this month, varying from 5c. to 15c. per share. Sales of Consolidated California & Virginia are reported at \$1.20@ \$1.30, and of Ophir at \$2@ \$7c. A 15c. assessment is due on Best & Belcher, which shows trading at 25c.

While stockholders in Standard Oil are rejoicing at the 20 per cent dividend just declared, against 8 per cent in the previous quarter, attention is called to the heavy fall in the market value of the shares. On Tuesday of this week when the big dividend was announced, the stock was quoted on curb at \$658, which is a drop of \$57 from early November last when the dividend was 12 per cent less than for the present quarter. Moreover, a year ago when the declaration was also 20 per cent, the stock brought \$816, thus showing that in a year's time the market value has depreciated \$258.

For the first time on Wednesday, the United States Reduction and Refining Company, the mill combination of Cripple Creek, Colo., was traded in on the New York Stock Exchange. Sales of 1,400 common shares were made on that day at \$38.50@ \$40. and 1,000 preferred at \$63.75@ \$64.62½. On January 1, this year the company issued its first quarterly dividend of 1½ per cent on the preferred stock, of which \$4,000,000 is issued. The common stock is \$6,000,000, and there is a bond issue of \$3,000,000 carrying 6 per cent. On January 31 the company had total assets of \$796,923. Profits for the six months ended January 31 were \$493,313. Deducting \$90,000 as interest on the bonds, and \$58,850 for the preferred dividend, there remains a surplus of \$344,463.

Auction sales were 85 shares Vulcan Metal Refining Company, of New Jersey, at \$142 3-8.

**Boston.** Feb. 5.

(From Our Special Correspondent.)

There has been a splendid market in mining shares the greater part of the week, and joy is spread on the faces of brokers and customers alike. The reduction in the price of copper early this week had the effect of tempering the buoyancy somewhat, and business lagged for a while, but to-day the pot was boiling again. Reports are current that an agreement has been made with the leading producers to maintain a price and to restrict the production. It is believed that if the latter can be effected the former will be an easy matter.

Col. Livermore, of the Calumet & Hecla Co. pany, leaves for Mexico this week.

An effort was made to make stocks look as weak as possible Tuesday, and offers to sell the next Amalgamated Copper dividend at ¾@ ½ of 1 per cent found ready takers. Trades were made on about 5,000 shares, and it looked as if the offers were made for effect. Tri-mountain has again been conspicuous during the week, advancing \$16.50 to \$75.50, with the last to-day at \$74. No one doubts that the property is proving a good proposition, but with the ownership as it stands there is hardly a limit as to price possibilities. Last month 290 tons of Tri-mountain ore was turned out from the Arcadian mill. The Osceola Mine's January yield is said to have been 900 tons mineral, and Tamarack 1,300 tons. Osceola varied \$5.25, touching \$89.75, and Tamarack \$27 to \$28, both reacting from these prices. Trinity has been heavy, touching \$13. It is thought there has been some selling against stock to be delivered to the promoters.

Dominion Coal and Dominion Iron and Steel securities have been largely in favor, and some buying is said to come from New York as well as from Toronto. The former touched \$70.75 to-day, an advance from \$63.37½ last week, and the latter touched \$32.25, an advance from \$28.50. Utah was another strong shot, rising from \$24 to \$27.25, closing at \$25.12½. Trading in this stock has been heavy. Adventure moved up to \$24, Mohawk to \$38.50, Mass to \$20.75, Centennial to \$15 and Wolverine \$5.50 to \$55, all closing at material recessions from these prices. The Centennial Mine is reported as closed down for repairs, but the opinion is expressed that the starting up again depends on the price of copper. A brokerage firm is soliciting Old Dominion proxies for use against the present management.

**San Francisco.** Feb. 1.

(From Our Special Correspondent.)

There has been much more activity in the stock market this week, although some quotations have been lower. The feature of the trading was a demand for the South end Comstocks, which have been rather neglected for some time.

Some quotations noted are: Consolidated California & Virginia, \$1.20; Ophir, 84c.; Silver Hill, 72c.; Mexican, 33c.; Caledonia, 25c.

On the Producer's Oil Exchange only moderate sales are reported, and the market was without special features. Monte Cristo brought \$1.50; Reed Crude, 39c.; Oil City, 23c.; Independence, 9c. The business was almost entirely in the low priced stocks.

**London.** Jan. 17

(From Our Special Correspondent.)

There has been a good deal of activity again this week in all sorts of South African shares. Diamond shares are following the lead of De Beers and mounting in value, though the physical conditions of the particular mines as regards permanence bear no resemblance to those of De Beers. Speculation goes on in low priced shares of undeveloped gold companies, but as these companies are mostly short of funds, reconstruction will be generally necessary, so that it is doubtful whether their shares are of great speculative value at present. The shares in land companies and controlling companies are in request.

Other sections of the mining market are not very active, though efforts are being made to revive interest in the shares in the West Australian market belonging to the Kaufman group. Mr. Kaufman has just arrived in Australia and has started sending home flaming reports of the glories of some of his mines. His report on the prospects of Golden Horseshoe is that the mine can be worked for an indefinite time and that the ore increases in value with depth. Some life is also observable in Great Fingalls, but with these exceptions the West Australian market is flat. West Africans are very weak and little business is done.

The Whitaker Wright group has been before the public again this week owing to the public examination of that gentleman by the official receiver in connection with the liquidation of the London & Globe and other companies. Very little was obtained by this examination as Mr. Wright is a past master of the noble art of knowing nothing when it is convenient to do so, and of showing that it was somebody else that did everything. At future examinations the opposing side will no doubt put awkward questions which will require all his skill in fencing. The chief question, however, has not yet been settled; that is whether the London & Globe is entitled to recover the debts alleged to be owing by the syndicate of brokers who acted in connection with the Lake View deal. This question will require separate legal proceedings and the steps taken to expedite it seem to be very far apart.

The Boston Consolidated Copper and Gold Mining Company is not altogether satisfying the shareholders and some of them are getting impatient. It will be remembered that this company was introduced in London some three years ago to work large bodies of low grade ore in Bingham District in Utah, adjoining the properties of the Utah Consolidated which also is

under Mr. Samuel Newhouse's management. The low grade ores are not amenable to any treatment so far devised, though experiments are being made with various processes. In the meantime work has been started on other claims which are between those of the Utah and the Bingham companies in the hopes of finding ores similar to those worked by the neighbors. It is stated now that an ore body of considerable width has been located, but no details are given. The only encouraging statement is that made by a director, viz., that he was offered £2 10s. per share for his holding of 70,000 of the £1 shares, but refused it. This may mean just as much or as little as the taste and fancy of the shareholders may make it.

The shareholders of the Velvet Roseland Mine, Limited, have agreed to a scheme of reconstruction which will provide about £25,000 new working capital. This company was formed in the summer of 1900 to acquire the mine of that name near Roseland, B. C., by the Tupper group of promoters. After flotation it was very soon found that the ore so far developed was of much lower grade than was anticipated and averaged not more than \$9 a ton. Mr. Morrish, the engineer, resigned and Mr. Sorensen was appointed to succeed him. Under his management a considerable amount of development work has been done and at lower levels, some fair bodies of shipping ore have been found. Efforts are now to be made to sort the ore more carefully as it is stoped and to ship a better quality than formerly. The shareholders have quite readily agreed to the reconstruction scheme and there is no reason why, with careful management, they should not receive some returns in time.

The shareholders of the Palmarejo & Mexican gold-fields are now in a very hopeful mood, and the shares in the company are certainly worth more at the present time than during the whole of the existence of the company. It will be remembered that the original company was formed over 15 years ago and that for years the vendors managed the properties in a scandalous way. Great credit is due to Mr. Southcott, the chairman, for ousting this management and for putting things on a sound basis, and to Mr. Oxnam, the present mine manager, for straightening things out at the mines. The property will be still further enhanced in value shortly by the opening of the new trunk line of the Kansas City, Mexico & Orient Railway, which will pass near the mines. The total area of the property owned by the company is over 100 square miles and hardly any of it has been prospected. Mr. Oxnam considers that it is of great value and that there are indications of many paying mineral deposits. Altogether there seems to be a

**DIVIDENDS.**

Name of Company.	—Latest Dividend—			Total to Date.
	Date.	Per Share.	Total.	
Adams, Colo.	Feb. 8	.05	7,500	723,500
*Ba Butte, Mont.	Feb. 10	.06	15,000	1,121,148
Cambria Steel, Pa.	Feb. 15	.75	750,000	4,500,000
*Central Lead, Mo.	Feb. 15	.50	5,000	277,000
Central Oil, W. Va.	Feb. 1	.25	15,000	82,500
*Colo. Fuel & L. pf.	Feb. 20	4.00	80,000	1,400,000
*Daly West, Utah	Feb. 15	.40	60,000	1,327,500
*Empire State, Ida.	Feb. 15	.05	25,277	1,308,892
*General Chem., com.	Mar. 1	1.00	71,673	722,691
*Gwin, Cal.	Feb. 17	.05	5,000	281,500
*Jeff. & Clearf. C. & I. pf.	Feb. 15	2.50	37,500	487,500
*La Fortuna, Ariz.	Feb. 10	.05	12,500	1,091,000
*Modoc, Colo.	Feb. 18	.01	5,000	240,000
*Quincy, Mich.	Feb. 15	4.00	400,000	13,270,000
*Quincy, Mich.	Feb. 15	1.00	125,000	975,000
Reed Oil, Cal.	Feb. 1	.02½	5,000	55,000
*Rocco Homestake, Nev.	Feb. 10	.01½	4,500	63,000
*Silver King, Utah	Feb. 10	.66½	100,000	4,950,000
Sta. Mariade Guad.	Feb. 10	4.43	11,075	303,675
*Standard, Con., Cal.	Feb. 24	.10	17,839	4,053,297
*Standard Oil	Mar. 15	.19	19,400,000	39,785,000
*U. S. Steel, com.	Mar. 21	1.00	5,084,350	15,227,812
*U. S. Steel, pf.	Feb. 13	1.75	8,927,933	26,752,894
*Monthly.	†Quarterly.	‡Semi-annual.		

**ASSESSMENTS.**

Name of Company.	Loca-tion.	No.	Delinq.	Sale.	Amt.
Alaska	Utah	7	Feb. 27		.02
Alpha Con.	Nev.	27	Feb. 29		.03
Andes	Nev.	10	Mar. 18		.05
Anundale	Utah	15	Mar. 12		.00½
App. Con.	Cal.	1	Feb. 6	Mar. 5	1.00
Best & Belcher	Nev.	3	Feb. 28		.15
Boas Tweed	Utah	4	Feb. 7	Feb. 24	.01
Ben Franklin	Cal.	4	Feb. 24		.00½
Century	Utah	11	Feb. 11		.10
Challenge	Nev.	9	Mar. 5		.05
Chollar	Nev.	17	Feb. 12		.05
Comstock	Utah	2	Jan. 20	Feb. 8	.10
Diamond Creek	Cal.	28	Feb. 28		.01
East Honerine	Utah	1	Feb. 12	Feb. 28	.00½
Emerald	Utah	15	Mar. 12		.00½
Garibaldi	Cal.	1	Jan. 21	Feb. 25	.01½
Gould & Curry	Nev.	2	Feb. 24		.10
Ingo Marble	Cal.	35	Jan. 15	Feb. 10	.05
Lady Washington	Nev.	23	Mar. 20		.03
Julla Con.	Nev.	17	Feb. 12		.03
Martha Washington	Utah	8	Jan. 25	Feb. 17	.01
Minnie	Utah	4	Feb. 22	Mar. 25	.001
Orient	Utah	2	Feb. 15	Mar. 15	.00½
Reward	Cal.	8	Feb. 8		.03
R. G. W.	Utah	24	Mar. 15		.00½
Savage	Nev.	2	Feb. 27		.05
Shower Con.	Utah	6	Feb. 3	Feb. 24	.02
Skylark	Utah	4	Feb. 10	Feb. 26	.00½
Tintle Copper King	Utah	5	Mar. 5		.00½
Twentieth Century	Utah	2	Jan. 17	Feb. 10	.001
Union Con.	Nev.	31	Feb. 24		.10
Wandering Jew	Utah	7	Jan. 24	Feb. 11	.001
West Morning Glory	Utah	10	Feb. 19	Mar. 8	.01
Willetta	Cal.	3	Mar. 5	Apr. 7	.01
Yellow Jacket	Nev.	5	Feb. 8	Mar. 18	.10
Yuba Con.	Cal.	5	Jan. 27	Feb. 17	.03



good chance for the Palmarejo to throw off its former reputation and to become a handsome dividend payer.

Paris. Jan. 26.

(From Our Special Correspondent.)

The slight activity which appeared in the market after the New Year's holiday seems to have subsided to a considerable extent. The mining stocks are somewhat neglected, with the exception of the South African gold shares in which there has been some movement, principally owing to the report that peace negotiations were really to be undertaken. The best informed people here, however, doubt very much whether Dr. Kuiper's mission will result in anything and are not inclined to take the same optimistic view of the future as seems to prevail in London. Our friends across the Channel, however, are taking it very seriously, and we hear of several new issues of stock and increases in capital proposed with the view of resuming and extending operations. The time seems to be too early yet, and it will be a good while before the Witwatersrand resumes the appearance which it presented three years ago.

The syndicate of Couillissiers, in view of these new issues and other matters, has issued a circular which is intended chiefly for the South African companies registered in London, although it applies to all whose stocks are dealt in here. This circular calls attention to the fact that stocks dealt in on the Couillisse must all be endorsed to bearer, and that consequently notices mailed to registered holders will fail to reach French owners of the stock. Any notices of new subscriptions and the like must be given by public advertisement, and the circular says that unless such publication is made by the 27th of each month—that is, three days before the monthly statement—and a period of at least 10 days given the stockholders to record their subscriptions, the Couillisse will refuse to deal in such new stocks.

The copper situation still appears to need explanation, and the despatches which are received here from your side do not explain. There are many opinions as to the future of the metal, but nearly every one believes that low prices are going to continue for some time. The effect upon the shares of the copper companies has naturally been very unfavorable.

While the figures for the total coal production have not yet been collected, the following statement is published for the departments of the Nord and the Pas-de-Calais, which together produce nearly nine-tenths of the coal mined in France. The production as shown in the following table is in metric tons:

	1900.	1901.	Changes.
Nord .....	5,692,503	6,007,324	D. 314,821
Pas-de-Calais .....	14,657,584	14,863,096	D. 205,422
Total .....	20,350,087	20,870,420	D. 520,243

The decrease of 2.5 per cent in 1901 in the face of the high prices which prevailed during a large part of the year is not a favorable sign for the maintenance of those prices, especially as it is said that most of the large companies are carrying very heavy stock in their yards. One explanation will be found in the following table showing the quantity of coke made:

	1900.	1901.	Changes.
Nord .....	789,486	599,320	D. 190,166
Pas-de-Calais .....	869,825	700,159	D. 169,666
Total .....	1,659,311	1,299,479	D. 359,832

A reduction of 27.7 per cent shows such a marked falling off in demand for fuel from the iron and steel works that it must naturally be believed that the decrease in the business of those works has been greater than most of them have been willing to admit.

A statement recently published by the Ministry of Commerce shows that the number of free passages given to immigrants to French colonies in 1901 was 934. Although this is a large gain over 1900, the number is really insignificant. Moreover, the immigrants of last year do not appear to have been very prosperous since the average capital which they took with them was only 800 francs, whereas in 1900 the average was 2,700 francs. The largest number, 170, went to Indo-China. To New Caledonia there were only 88, notwithstanding the constant demand for labor which comes from that colony. It appears that the use of New Caledonia as a penal settlement has operated very injuriously upon the voluntary immigration.

AZOTE.

#### COAL TRADE REVIEW.

New York. Feb. 7.

##### ANTHRACITE.

Winter weather of the old fashioned kind has prevailed during the greater part of the past week and the consumption of anthracite has been heavy, everything favors a good demand until well into March, and the trade enters on the last half of winter with things on a very firm basis. All the producing companies report that they have business enough and are not worrying about the future. The possibility of labor troubles is still rather remote and it is probable that serious difficulties may be averted before April 1. Meanwhile the possibility of a general strike

will doubtless lead to heavier buying during the next few weeks than is warranted by actual needs.

In the northwest there is a good steady winter market, though trade is not especially active. The supplies on docks at the head of the lakes are thought sufficient for all needs before the opening of navigation. In Chicago territory the cold wave brought out a rush of retail orders, though the increased demand was not as large as some persons in the trade expected. However, it helped clear up accumulations of all-rail coal and the general outlook for business in Chicago territory during the next month is excellent. Nut coal continues in very short supply. Along the lower lakes and in Canadian territory business has been brisk, and receipts, while showing some improvement, are not as heavy as desired. Here, as elsewhere, car supply affects all-rail shipments. The railroads seem to have more cars available than a while ago, but the supply is still insufficient. The line trade at points farther east felt the storms and demand has been active. Along the Atlantic seaboard business is good enough to suit most any dealer. The total movement of coal from the collieries is still affected by the December floods and the tonnage of January was lower than it would have been but for this. However, short supply in December and January with a cold winter means a lot of buying in February and March. This is likely to be the case at many points. It is said that Boston is one of these.

We continue to quote free burning white ash coal f. o. b. New York Harbor shipping ports as follows: Broken, \$4; egg, \$4.25; stove and nut, \$4.50.

##### BITUMINOUS.

The lower grades of coal in the Atlantic seaboard bituminous trade are in better supply while the higher grades are in poorer supply. It is said that car supply for the poorer grades is now fully as bad as at any time within the past 5 months. Contracts for the next season's business are under discussion, but few are closed. People are shy of committing themselves until they know something definite about what the railroads propose doing. However, February, 1901, was a lean month for business, and it may be that this year, as last, better conditions will prevail when contracts are being closed in March.

Trade in the far East shows a fair demand. The amount of coal going forward to that territory is thought to be moderate. Along Long Island Sound the market, so far as the poorer grades are concerned, is in easier condition. The demand for the better grades still exceeds the available supply. At New York Harbor points the situation is better than a couple of weeks ago. All-rail trade is badly off for coal. Some concerns have all they can do to keep their plants going, and are paying \$1.40@1.50 at the mines for the poorer grades.

Transportation from the mines to the tidewater shipping ports is very good, and but a small amount of coal is in transit. Car supply at the mines continues variable, some districts getting better supplies than others; generally speaking the supply is from about 25 per cent to above 50 per cent of the demand. In the coastwise vessel market vessels are in sufficient supply and freight rates have fallen. Heavy winds and fogs along shore have delayed the movement of coal. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 90c.; Boston, Salem and Portland, \$1; Wareham and Newburyport, \$1.15; Lynn, \$1.10; Portland, \$1.05. Rates from the Chesapeake Bay ports are 5@10c. higher.

Clearfield coal is quoted at \$2.55@2.65 f. o. b. New York Harbor shipping ports. The lower grades are practically out of the market.

Birmingham. Feb. 3.

(From Our Special Correspondent.)

The coal production in Alabama is on the increase, and the demand is strong. The larger consumers are having their demands met with greater facilities, and there is not so much of a scramble as was evident a few weeks back. Coal is bringing the same prices as prevailed for some weeks. There are no labor troubles in the district, and the maximum wage is being given the miners, 55c. per ton. The wage will continue during this month at least, the average selling price of pig iron warranting this condition. President Edward Flynn, of the district organization of the United Mine Workers of America, and other delegates from the district to the national convention held in Indianapolis, Ind., have returned.

The announcement is made that the Ensley Southern Railroad, which is extending through a very rich coal-field, will now be pushed to completion. The company has been assured of much development along this line, and the opening of several new mines is promised.

The demand for coke is holding up well, and is inclined to be a little more active. The Semet-Solvay By-Product Company has put in blast a new battery of ovens at Ensley, and other companies are preparing to increase their production of coke.

Chicago. Feb. 4.

(From Our Special Correspondent.)

The soft coal market is active, with but little eastern coal and practically no Ohio coal coming in. The following prices prevail, for delivery on cars in Chicago: Birdseye cannel, \$5.50; West Virginia splint, \$3.50; Hocking lump, \$3.50; lower-vein Brazil block, \$2.80; Indiana semi-block, \$2.40; Clinton lump, \$2.25; smokeless lump, \$3.80; smokeless egg, \$4.00; smokeless mine-run, \$3.50. Blacksmiths' coal is quoted at \$3.50. For delivery on cars at Milwaukee the following prices are quoted: Hocking lump, \$4; Youghiogheny lump, \$3.45; Pittsburg lump, \$3.45; West Virginia lump, \$3.35. For Duluth delivery on cars Youghiogheny screened lump brings \$3.45; West Virginia lump \$3.35 and Hocking lump \$3.50. Anthracite prices are firm, with a scarcity of chestnut and the prospect of an advance on that grade. Grate is quoted at \$5.75 and egg, stove and chestnut at \$6.

As the result of the refusal of the Coal Teamsters' Union to haul coal to buildings supplied through the summer with fuel gas for heating purposes, sixteen of the largest office buildings in the downtown district have signed agreements to abandon the use of gas and to use coal throughout the year. The buildings include the Monadnock, Marquette, Auditorium, Siegel, Cooper & Co., Western Union, Pontiac, Caxton, Monon, Venetian, McClurg, Great Northern and other well known structures. It is claimed by the teamsters that the practice of using gas in summer and coal in winter has resulted in overloading them with work in the cold months and in making work scarce in the summer. Practically every retail firm in the city was notified by the drivers that they would not deliver coal for temporary use. Appeals by owners of buildings to the retail dealers were fruitless, the dealers not wishing to combat the union. The excessively cold weather of the last two or three days has helped the teamsters greatly, since deliveries of coal must be made immediately.

Cleveland. Feb. 4.

(From Our Special Correspondent.)

The coal trade has picked up during the past few days. The cold snap that settled over this district the latter part of last week has already about stripped the stock piles of their surpluses and it is beginning to be a movement direct from the mines to the retailers. This movement has been retarded somewhat during the past few days, as the railroads have been snowbound and their movement of coal has been very light. Most of the freight has had to go on a siding and wait more auspicious times for the movement and this fact alone is making it extremely difficult to keep the stock of coal up to what it ought to be. With the better demand and the lessened supply prices show a tendency to reflect the conditions of the market by advancing but have been held steady so far. Ohio coals, which are mostly sold here for domestic purposes, are bringing: Run-of-mine, \$1.75; 3-4-in., \$1.85; slack, \$1.30. Pittsburg coal is bringing better prices, being quoted on a basis of \$2.25 for 3-4. Run-of-mine is bringing \$2.10.

Nothing has been done so far about fixing the prices at which lake coal shall be sold during the year but it is expected that the meeting of coal men will be held soon for this purpose. Some of the shippers are already making their estimates of possible lake shipments during the year and all of these are heavy. The lake carrying rate has hardly been discussed.

Pittsburg. Feb. 5.

(From Our Special Correspondent.)

Coal.—Trade continues in excellent condition, and all the mines are in full operation in this district. Prices remain unchanged, and are the same as announced by the two combinations when the new mining scale went into effect on April 1. There was some shading of prices during the year by independent companies in order to secure special contracts, but the market is firm. The Monongahela River Consolidated Coal and Coke Company sent out fully 6,000,000 bush. of coal on the present rise in the rivers, and enough empty coal boats and barges will be brought back on the return trips of the tow boats to ensure a steady operation of the river mines for several months. The conference on the wage scale for the year beginning April 1 is on this week at Indianapolis, and the outlook for a satisfactory settlement at this writing is not particularly good. The miners ask for an advance of 10 per cent on a run-of-mine basis and an increase in pay of day labor. The operators proposed a reduction of 10 per cent.

Connellsville Coke.—The bad weather of the past week prevented the satisfactory moving of railroad cars, and as a result shipments of coke fell off considerably. These conditions had the effect of still further stimulating prices, and as high as \$3 and \$3.25 was paid for furnace coke, while \$4 was received for foundry. The contract price for coke is \$2.25 for furnace and \$2.75@3 for foundry. There are 21,125 ovens in the Connellsville region, and of



this number 20,286 are active and 839 are idle. The *Courier* in last week's issue gives the production for the week at 208,057 tons, a gain of 637 tons, and the shipments were 10,914 cars distributed as follows: To Pittsburg and river tipples, 3,692 cars; to points west of Pittsburg, 5,388 cars; to points east of Connellsville, 1,834 cars. This was a decrease of 363 cars compared with the shipments of the previous week.

The latest charter reported is for coal from Philadelphia or Baltimore to Genoa, Italy, at 8s. (\$1.92) per ton, January sailing. This shows that ocean rates are still low, as it is a reduction of nearly 40 per cent from the rates charged three or four months ago.

The imports of coal into the port of Genoa, Italy, for the year just closed are reported as below, in metric tons:

	1900.	1901.	Changes.
Great Britain .....	2,390,384	2,122,769	D. 237,615
United States .....	93,147	83,052	D. 10,095
Other countries .....	2,092	15,151	I. 13,059

Totals .....

	2,455,623	2,220,972	D. 234,651
The imports for 1900 were the largest ever reported, in 1899 the total was 2,356,046 tons, of which only 18,138 tons were from the United States.			

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of January 24th, that the tone of the Welsh coal market remains steady both for Cardiff and Monmouthshire descriptions. Small coals are in good demand at an advanced price. Quotations are: Best Welsh steam coals, \$3.84@3.96; seconds, \$3.72; thirds, \$3.54; dry coals, \$3.72; best Monmouthshire, \$3.60@3.72; seconds, \$3.48; best small steam coal, \$2.64; seconds, \$2.34; other sorts, \$2.04.

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 1/2 per cent discount.

The general tone of the freight market remains easy but little business has been done during the past week. Rates of freight show little quotable change. Some rates from Cardiff are: Algiers, \$1.30; Marseilles, \$1.35; Genoa, \$1.32; Naples, \$1.32; Port Said, \$1.26; Singapore, \$2.76; Las Palmas, \$1.32; St. Vincent, \$1.50; Rio Janeiro, \$2.56; Santos, \$2.88; Buenos Aires, \$2.34.

**IRON MARKET REVIEW.**

NEW YORK, Feb. 6.

The pressure of business continues very strong, and there has been a great deal of contracting running over into the second half of the year. There is a strong disposition on the part of some of the minor interests to advance prices. In structural material for which demand is especially strong, there have been some increases in quotations. In rails there are reports that at least one order has been placed abroad, our own mills being unable to give deliveries as soon as wanted. Some more sales of German billets are reported to mills which have been unable to get steel at home.

A question has arisen as to the nature of some of the buying for the second half of 1902. Some people are inclined to think that at least part of it is speculative, and that such transactions may cause some trouble later. If this is so—and it is given only as rumor—the operators seem to have been quite successful in taking up furnaces and mill capacity.

Birmingham. Feb. 3.

(From Our Special Correspondent.)

The activity in the pig iron and steel markets in Alabama continues, and the prospects are bright. There is a steady demand, while deliveries are being made regularly on orders placed some time ago; new orders are coming well. The quotations are still firm, and looking upwards.

The report of the Southern Iron Committee for the month of January, which will be made public during the next few days, will show, it is believed, better shipments during January than during the same month last year. The railroads were able to furnish more cars.

The following quotations are given: No. 1 foundry, \$12.50@12.75; No. 2 foundry, \$12; No. 3 foundry, \$11.50; No. 4 foundry, \$10.75@11; gray forge, \$10.50; No. 1 soft, \$12.50; No. 2 soft, \$12.

The steel industries at Ensley are losing but little time, and some of the accumulation of steel billets on the yards at the steel plant is beginning to be worked off. The plant of the Alabama Steel and Wire Company continues in steady operation, notwithstanding the litigation in the courts, which has been on for some time. Good prices prevail.

The bar iron trade could be better, but it is not in bad condition, and there is steady employment for a large complement of hands at the mills. All the mills in the State are now in operation. The Helena mills, belonging to the Alabama Tube and Iron Company, has not sought the open market for bar iron to any extent, the tube plant, which has just been started manufacturing pipe 1 and 2 in. in diameter, requiring about the entire production of the mill.

The Republic Iron and Steel Company is erecting a third furnace in the Birmingham District, the com-

pletion of which has been delayed by slow delivery of machinery. This furnace will be the largest in the Birmingham District, and its success may determine the erection of a large steel plant here. There is an effort being made to organize a company for the erection of a big rolling mill in the Tuskalooza District, which is near a waterway to the gulf, the Warrior River being improved by the Government in the neighborhood of Tuskalooza; there are coal and ore mines near by, and already the Central Iron Company is developing property and making preparations to erect a large furnace in that vicinity, besides constructing a railroad to the mineral properties. Mr. Ben Catchings is behind the rolling mill movement, and already has assurance of the capital necessary for the plant.

Buffalo. Feb. 4.

(Special Report of Rogers, Brown & Co.)

The situation is unchanged. Furnaces continue to withdraw from the market with monotonous regularity. However, when consumers state their exact needs it is usually possible to procure sufficient iron for actual requirements, at reasonable prices. We quote below on the cash basis, f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$17.75; No. 2, \$17.25; Southern soft No. 1, \$17; No. 2, \$16.50; Lake Superior charcoal, \$19.75.

Chicago. Feb. 4.

(From Our Special Correspondent.)

The market for pig iron continues firm and heavy sales are reported made last week. Prices for Southern iron remain about the same; for Northern there is something of an advance. No. 2 Northern is quoted at \$16.50@17 and malleable at \$17@17.50 per ton. Northern charcoal is in demand at \$19.50@20. Coke is scarce and much in demand, owing to the inability of the railroads to transport it promptly. Foundry coke is quoted at \$5.50@6.00 per ton. The furnaces are practically living along from day to day on the inadequate supply. The cold weather of the last three days has greatly affected shipments, reducing them to about half the amount shipped in the three days previous. The new stack B of the Iroquois Iron Company went into blast a week ago, at South Chicago. On February 2 the plate mill of the Illinois Steel Company, at South Chicago, shut down for a week's repairs. This mill employs about 800 men.

Cleveland. Feb. 4.

(From Our Special Correspondent.)

Iron Ore.—The sales of ore up to this time, while not covering the entire output for the coming season, have been very heavy. They are probably less than they would have been had not the so-called independent furnaces in the Valleys covered their needs earlier in the year by a purchase of 2,000,000 tons for delivery this season. The program of prices, as mapped out by the Ore Association and among the merchant mines a week ago, is being adhered to strongly in present sales, the quotations being \$4.25 for bessemer old range; \$3.25 non-bessemer old range; \$3.25 bessemer Mesabi and \$2.75 for non-bessemer Mesabi, lower lake ports. Nothing has been done about fixing the rate of carriage for the year although it is conceded that something is likely to be done in the next few days, probably upon the basis of last season's contracts.

Pig Iron.—Foundry producers have sold material for the second half of this year in large quantities during the past week. The faith which consumers have in the future of the market has prompted them to buy heavily at the prevailing prices of \$16.50 for No. 1 and \$16 for No. 2 Valley furnace. There is little iron to sell during the remainder of the first half of the year. Basic iron has been sold for delivery during the second quarter at the same price of \$15.75, Valley furnace. The quantities have not been large so far. Bessemer iron is about sold up for the first half and neither the buyers nor the furnaces seem ready to talk business for the second half, or even the third quarter.

Finished Material.—The producers of bar iron have decided to advance the price of that material to 1.60c. Pittsburg, being an increase of \$2 a ton. This virtually puts bar iron back upon the same basis it occupied when Youngstown was the basing point. Steel bars have been retained at 1.60c. Pittsburg for open-hearth and 1.50c. Pittsburg for bessemer. The sales this week have been very heavy. Plates are in good demand and the market is strong at 1.70c. There is a good business ahead, due to some orders in prospect for more ships. Structural material is so hard to obtain that most of the business is now being done out of store, with prices ranging well up, 2.25c. being obtained with little difficulty. There is still some call for billets, but none of the mills seem to have any to spare. Those who depend upon others for their steel therefore are being compelled to look to foreign markets for their supply and the outlook is not very encouraging. Not enough business is being done to warrant a quotation. Sheets likewise are in good demand with the prices holding about as they have been. Comparatively few mill sales have been made of late, most of the business being out of store and even there some gauges are getting scarce. The prices are based

upon a quotation of 3.35@3.50c. in store for No. 27 one pass cold rolled with 10c. added for full cold rolled.

Old Material.—The scrap trade has settled down upon the same basis, during the last few days, that it occupied a few weeks ago, after the unsuccessful attempt to bull the market. The prices are as follows: Old iron rails, \$22; heavy steel, \$17; steel rails, \$17; No. 1 wrought, \$16; cast borings, \$8; wrought turnings, \$12.25; cast scrap, \$13; stove plate, \$10.

Pittsburg. Feb. 5.

(From Our Special Correspondent.)

The iron and steel markets continue firm with a strong upward tendency, which even the leading steel interest may be unable to check. Particularly is this the case with structural material. Despite the heavy demand which is greater this week than ever before, and the fact that premiums are paid for early delivery, the leading interests continue to quote the same prices that have ruled for several months. There was something of a stir in steel circles when the announcement was made to-day that two Eastern concerns had advanced the price of structural material \$4 a ton, increasing the price of beams from 1.60c. to 1.80c. While it is admitted that the demand warrants higher prices than those quoted, fear is expressed that further advances may follow and result seriously to the markets. Efforts are being made to prevent too rapid advances in prices. This was shown by the action of the recently formed pool of wire and wire nail interests. At the time prices were advanced \$1 a ton, and during the week another dollar was added to the price. Plain wire is now quoted at \$40 a ton, and wire nails at \$2.05 a keg in car-load lots, Pittsburg, with freight added to destination. Galvanized wire has been advanced to \$8 a ton.

A peculiar feature of the nail market was developed when the manufacturers of cut nails met and reduced the price 10c. a keg to \$1.95 in car-load lots f. o. b. Pittsburg, with freight added to destination. Early in January cut nails sold at \$2.05 and wire nails at \$1.95. Now the conditions are reversed. Cut nails are in good demand, and ruled higher than wire nails for several months. The reduction in price caused some surprise.

The transportation facilities of the railroads were again crippled, this time by the weather, which rendered it difficult to move freight. As a result the coke supply at the blast furnaces was not up to the requirements. None was forced to suspend operations, however, but the product at several of the furnaces was reduced. There is no falling off in the demand for pig iron, and some large sales were made during the week at the ruling prices, except where early delivery is desired. There is scarcely any bessemer pig iron to be had for the first, and but little for the second quarter. Foundry iron is also well sold up for the first half, and this may also be said of gray forge.

The sheet steel market shows a great improvement, and it is possible that higher prices may rule before the close of this quarter. A. F. Baumgarten, vice-president of the Maryland Sheet and Steel Company, of Cumberland, Md., with headquarters in this city, is promoting a plan for the formation of an association of independent sheet manufacturing concerns. In response to invitations sent out by him a meeting was held here on Monday at which from 15 to 20 companies were represented. It was denied that the object of the proposed organization is to regulate prices, but merely for the purpose of exchanging views for mutual benefit. At the close of the meeting it was given out that no definite had been done, and that another meeting will be held within two weeks. None of the independent companies in this district attended the meeting.

Pig Iron.—Sales of bessemer pig iron this week aggregated 15,000 tons, most of which is for delivery in the second quarter at \$16@16.50, Valley furnaces. About 4,000 tons of gray forge were sold at \$16.50. Pittsburg, No. 2 foundry iron continues in heavy demand, and \$16.75, Pittsburg, is offered for the second half. Prices range from \$17 to \$17.25 for delivery before July 1.

Steel.—The steel market is quiet. A few small sales of bessemer steel billets were made at \$28.50@29. Steel bars are more active, and several large sales were made at the ruling price of 1.50c. Tank plate is still quoted at 1.60c.

Sheets.—The market is much improved this week, and prices are firmer except for galvanized sheets, which show signs of weakness. The American Sheet Steel Company continues to quote No. 28 gauge at 3.10@3.20c. and galvanized sheets at 70 and 10 to 70 and 5 per cent off.

Ferro-manganese.—There is no change, the principal producer continuing to quote 80 per cent domestic at \$52.50.

New York. Feb. 7.

Pig Iron.—Demand is as active as ever, while the difficulties of getting prompt delivery are increasing. Prices tend upward. We quote for tidewater delivery: No. 1X foundry, \$17.50@17.75; No. 2X,



\$16.50@17; No. 2 plain, \$16@16.25; gray forge, \$15.35@15.85. For Southern iron on dock, New York, No. 1 foundry, \$16.25@16.50; No. 2, \$15.75@16; No. 3, \$15.25@15.50; No. 4, \$14.75@15; No. 1 soft, \$16.50; No. 2, \$15.75@16.

**Bar Iron and Steel.**—There is no change in demand. We quote 1.58c. for common bars in large lots on dock, refined bars, 1.63@1.68c.; soft steel bars, 1.68c.

**Plates.**—There is a continued steady demand and higher prices are talked of. We quote for tidewater delivery in car-loads: Tank, 1/4-in. and heavier, 1.78c.; flange, 1.88c.; marine, 1.98c.; universal, 1.78c.

**Steel Rails and Rail Fastenings.**—With mills having orders for months ahead new business is out of the question and imports are unlikely. Standard sections are still 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.**—Demand continues firm and prices are higher in this territory. We quote for large lots at tidewater as follows: Beams, 1.80@1.95c.; tees, 1.85c.; angles, 1.80c.

**CHEMICALS AND MINERALS.**

(For further prices of chemicals, minerals and rare elements, see page 234.)

**New York. Feb. 6.**

The continued high prices of raw material, notably nitrate of soda, have made some consumers apprehensive. In the case of nitrate of soda there has been forced buying, as prices have risen to the level established by the New York corner of a few years ago, that was broken almost immediately after its inception, entailing heavy losses to the promoters. The high prices at present are the result of a shortage in visible supplies, and a firmer coast market owing to the European demand. Manufactured products are moving chiefly on contract at unchanged prices.

**Heavy Chemicals.**—Firmer owing to the continued good demand for shipments. Domestic high-test alkali sold for immediate delivery at \$5@87 1-2c. per 100 lbs., f. o. b. works, while next fire business has been done at \$0@82 1-2c. f. o. b. works. Higher ocean freights have strengthened foreign alkali at \$0@92 1-2c. per 100 lbs. in New York, but trade is limited. Prompt sales of domestic high test caustic soda are noted at \$1.95@82 per 100 lbs., f. o. b. works, while yearly contracts are being booked extensively at \$1.90 f. o. b. works. Foreign is featureless at \$2.25@2.75 per 100 lbs. for 76 per cent in New York. Bicarb. soda shows an improvement all round as regards consumption, but prices remain at \$1 per 100 lbs. for ordinary in kegs, f. o. b. works, and \$3 up for best grades, f. o. b. works. Sal soda is not being forced for sale, as makers' stocks are only moderate, holding prices at 55c. per 100 lbs., f. o. b. works, and 65c. in New York. Foreign is firm at 67 1-2@70c. per 100 lbs. here. Liverpool prime bleaching powder is in medium request at \$1 7-8@82 per 100 lbs. for early shipment and at \$1.75@1.85 for yearly deliveries; while other makes are quoted at \$1 5-8@1 3-4 on small sales. Chlorate of potash on spot is offered at \$8@88 1/2 per 100 lbs., for domestic powdered, while yearly contracts are being booked on the basis of \$7 3-4 f. o. b. works.

**Acids.**—Deliveries are generally better than they have been, and prices are firm.

Holdings of blue vitriol seem less inclined to sell at present prices, anticipating a further improvement when the export trade assumes larger proportions.

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, com'l 28%.....\$1.80	Oxalic, com'l.....\$4.15@5.12 1/2
Blue vitriol.....4.25@4.50	Sulphuric, 50 deg., bulk ton.....14.00@16.00
Muriatic, 18 deg.....1.50	Sulphuric, 60 deg.....1.00
Muriatic, 20 deg.....1.62 1/2	Sulphuric, 66 deg.....1.20
Muriatic, 22 deg.....1.75	Sulphuric, 68 deg.....1.20
Nitric, 36 deg.....4.00	Sulphuric, 70 deg.....1.20
Nitric, 38 deg.....4.25	Sulphuric, 72 deg.....1.20
Nitric, 40 deg.....4.50	Sulphuric, 74 deg.....1.20
Nitric, 42 deg.....4.87 1/2	Sulphuric, 76 deg.....1.20

**Brimstone.**—A cargo of 800 tons arrived at New York this week. The present ocean freight from Sicily is 8s. (\$1.92), at which a charter has already been taken to Baltimore. Spot best unmixed seconds are firm at \$28 per ton, to arrive \$25, and shipments \$23@23.25. Best thirds are about \$2.50 per ton less than seconds.

**Pyrites.**—Market is seasonably quiet at unchanged prices.

Quotations are f. o. b.: Mineral City, Va., lump ore, \$5 per ton, and fines, 10c. per unit; Charlemont, Mass., lump, \$5, and fines, \$4.75. Spanish pyrites, 12@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.

**Sulphate of Ammonia.**—Production in America is rapidly increasing as new by-product coke ovens are being built. Gas liquor, 24@25 per cent, is held at \$2.88@2.90 per 100 lbs., according to position. Abroad the market is firm.

**Nitrate of Soda.**—The *Queen Louise* arrived at New York with 18,684 bags, nevertheless the market is particularly strong, rising to \$2.25 per 100 lbs. for prompt delivery, and \$2.05 for future arrivals. Importers attribute this advance to the anxiety of consumers to place orders while the visible supply shows a shortage. Simultaneously the demand in Europe has increased, strengthening the views of producers in Chile. Conservative buyers feel that prices cannot advance much more without materially reducing consumption. Certainly sellers are aware of this. Last year the imports into the United States were 208,679 tons, against 182,108 tons in 1900, and 146,492 tons in 1899, showing an increase of nearly 30 per cent in 3 years. At present high prices, however, it is feared buying may be curtailed.

Messrs. Mortimer & Wisner's monthly statement of nitrate of soda, dated New York, Feb. 1, gives the following statistics:

	1902.	1901.	1900.
	Bags.	Bags.	Bags.
Imported into Atlantic Ports from West Coast S. A. from Jan. 1, 1902, to date.....	92,990	74,784	38,925
From Europe.....	.....	.....	.....
Total.....	92,990	74,784	38,925
Stock in store and afloat Feb. 1, 1902:—			
New York.....	.....	6,494	9,094
Philadelphia.....	.....	.....	.....
Baltimore.....	45,580	.....	750
Norfolk, Va.....	.....	.....	.....
Charleston.....	.....	.....	.....
Savannah.....	.....	.....	.....
Boston.....	.....	.....	.....
To arrive May 15, 1902.....	251,000	420,000	343,000
Visible supply to May 15, 1902.....	296,580	426,494	352,844
Stock on hand Jan. 1, 1902.....	77,517	13,446	9,586
Deliveries past month.....	124,927	81,736	38,667
Total yearly deliveries.....	1,308,820	1,176,651	.....
Prices current, Feb. 1, 1902.....	2 1/2	1.85	1.82 1/2

**Phosphates.**—Evidence of better prices this year is shown by the firmness of producers, especially those who do a large export business. With comparatively smaller stocks on hand than a year ago, and a business-like regulation of the output, there seems little doubt that the industry will be made more profitable. In the hard rock region of Florida some 52 plants are operating, something over one-half the total number capable of producing. In the pebble districts work is active, as considerable stuff has already been sold for future shipment. Soon the Peace River Phosphate Mining Company's extensive plant at Hull, which was destroyed by fire several weeks ago, will be ready for operation as it is being rapidly rebuilt. The company's railroad is also being put in order. In 1901 this company shipped 46,813 tons phosphates against 54,506 tons in 1900; the decrease being 5,056 tons in domestic, and 2,637 tons foreign. Great Britain received all exports, while Baltimore and Pensacola took the domestic allotments.

In Tennessee miners are busy on orders taken lately. Expectations are that a larger export business will be done this year than last, when 124,335 tons were sent chiefly to France, Italy and Great Britain.

South Carolina rock is in fair request and some has recently gone abroad, though export trade is not active, owing to competition with Algerian.

News from abroad reports that 300,000 tons of Tunis, and 250,000 tons Algerian rock have been contracted for this and next year's delivery. The bulk of the orders were taken some time ago, when prices were at a rather low level. The Tunis orders cover the 1902 output of the Gafsa Company. Prices at present are nominal, owing to the lack of demand.

The Maatschappij Aruba Phosphate Company shipped in the year from October 1, 1900, to September 30, 1901, 23 vessels laden with phosphates from Curacao, W. I.

Phosphates.	Per ton F. o. b.	C. I. F. Un'd Kingdom or European Ports.	
		7 mt	Long ton
*Fla. hard rock (77@80%)	\$7.50 7 @7 1/4 d	\$10.92@11.31	
*Fla. land neb. (68@73%)	3.00@3.25 5 @6 1/4	7.00@8.40	
*Fla. Peace Riv. (58@63%)	2.25@2.50 5 @5 1/4 d	6.00@6.60	
*Tenn. (78@80%), export	3.50 6 3/4 @7 d	10.53@10.92	
*Tenn. ....78% domestic.	3.00@3.25		
*Tenn. ....75% domestic.	2.75@3.00		
*Tenn. ....70@72% domestic.	2.25@2.50		
So. Car. land rock.....	3.25 4 1/2 @5 d	5.67@6.30	
So. Car. River rock.....	2.75@3.25		
Algerian, rock....(53@70%)	6 @6 1/4 d	8.04@8.70	
Algerian, rock....(58@63%)	5 @5 1/4 d	6.00@6.30	
Tunis, Gafsa....(58@63%)	5 @5 1/4 d	6.00@6.30	

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

Acid phosphate is quoted at 57 1/2@60c. per unit.

**Liverpool. Jan. 22.**

(Special Report of Joseph P. Brunner & Co.)  
An improved trade is reported in heavy chemicals generally, but without any special activity in export business. Soda ash is fairly brisk, more especially as regards deliveries to home trade consumers, and prices are firm all round. For tierces, nearest spot range may be called about as follows: Leblanc ash, 48 per cent, £5 15s@£6; 58 per cent, £6 2s. 6d. @£6 7s. 6d. per ton net cash. Ammonia ash, 48 per cent, £4 10s.; 58 per cent, £4 10s.@£4 15s. per ton net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in fair request for markets at £3 7s. 6d. per ton less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caus-

tic soda is meeting with rather more inquiry, and prices steady as follows: 60 per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton net cash. Bleaching powder is rather inactive, but there is little unbarred make offering, and for hardwood £6 15s.@£6 17s. 6d. per ton net cash is still about nearest value, with special terms for Continental and a few other export markets. Chlorate of potash is quiet at about 3 1-8d. per lb. net cash. Bicarb soda is unchanged, and 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 is only sparingly offered, and although the demand is perhaps not quite so active this week, quotations are well maintained at £11 10s.@£11 15s. 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 again firmer, spot lots being now quoted at £10 2s 6d.@£10 5s. per ton, less 2 1/2 per cent for double bags f. o. b. here, as to quality and quantity.

**METAL MARKET.**

**New York. Feb. 6.**

**GOLD AND SILVER.**

**Gold and Silver Exports and Imports.**  
At all United States Ports in December and Year.

Metal	December.		1900.	Year.	
	1900.	1901.		1900.	1901.
Gold Exports....	\$410,533	\$4,744,073	\$54,134,623	\$57,729,889	
Imports....	3,386,611	2,410,966	66,749,084	54,381,882	
Excess. I.	\$2,976,078	E. \$2,333,107	I. \$12,614,461	E. \$3,348,007	
Silver Exports....	\$7,358,339	\$4,723,982	\$66,221,684	\$55,638,901	
Imports....	3,117,857	2,784,757	40,100,343	31,142,949	
Excess. E.	\$4,240,482	E. \$1,939,225	E. \$26,121,321	E. \$24,495,952	

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 February 6, 1902, and for years from January 1, 1902, 1901 and 1900.

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week....	\$4,281,835	\$17,233	\$830,645	\$11,880	E. \$5,093,367
1902.....	6,236,330	89,236	4,703,016	119,737	E. 10,130,213
1901.....	8,279,690	332,257	3,845,904	538,777	E. 11,884,460
1900.....	1,679,788	658,636	4,274,759	438,839	E. 4,857,048

Of the gold exported this week France received \$4,273,314, while the silver went chiefly to London. The imports were from Central and South America and the West Indies.

**Financial Notes of the Week.**

Business continues steady and transactions show little change in volume. Money is a little less abundant in New York. The feature of the week is the taking of some \$4,000,000 in gold for shipment to France. The most plausible explanation of these shipments is that they are in settlement of loans made from French bankers at the time of the Northern Pacific overturn in Wall Street.

The statement of the New York Banks, including the 63 banks represented in the Clearing House, for the week ending February 1, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts....	\$699,582,600	\$871,808,200	\$889,531,700
Deposits.....	795,917,300	969,917,500	975,997,000
Circulation.....	16,860,900	31,319,100	31,365,200
Specie.....	162,765,100	192,825,000	192,815,200
Legal tenders.....	67,085,500	74,493,200	77,807,400
Total reserve.....	\$229,850,600	\$267,318,200	\$270,622,600
Legal requirements.....	198,969,325	242,479,375	243,999,250
Balance surplus.....	\$30,881,275	\$24,838,825	\$26,623,350

Changes for the week, this year, were increases of \$19,589,100 in loans and discounts; \$26,230,200 in deposits, \$6,924,000 in specie, \$949,500 in legal tenders, and \$1,290,950 in surplus reserve; a decrease of \$348,700 in circulation.

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

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. A'd.....	\$192,825,000	.....	\$192,815,200	.....
England.....	163,316,390	.....	183,083,885	.....
France.....	470,789,120	\$219,052,260	401,714,615	\$219,829,775
Germany.....	141,310,000	72,795,000	167,705,000	86,395,000
Spain.....	70,005,000	\$2,815,000	70,160,000	87,885,000
Neth'ls.....	25,140,000	28,375,000	28,061,500	31,831,500
Belgium.....	14,570,000	7,285,000	15,666,665	7,833,335
Italy.....	77,820,000	9,240,000	79,415,000	10,468,000
Russia.....	366,390,000	31,710,000	354,560,000	32,565,000

The returns of the Associated Banks of New York are of date February 1, and the others January 30.



as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie coined is chiefly gold. The Bank of England reports gold only.

The silver market continues very steady. Supplies seem to be worked off without any material depression of price. There are no new features in the situation.

Receipts of silver at the United States Assay Office in New York for the week ending February 6 were 40,000 oz.

Shipments of silver from London to the East for the year up to January 23 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India .....	£612,500	£542,220	D. £70,280
China .....	44,375	.....	D. 44,375
The Straits .....	.....	.....	D. ....
Total .....	£656,875	£542,220	D. £114,655

Arrivals for the week, this year, were £248,000 in bar silver from New York, £22,000 from Australia, and £3,000 from West Africa; total, £273,000. Shipments were £130,000 in bar silver to Bombay and £67,500 to Calcutta; total, £197,500.

Indian Exchange is strong, Council bills having been in demand in London at 16.03d. per rupee. Some silver is also going forward on Indian account; but on the other hand, some gold is reported on its way from India to London.

Imports of specie at San Francisco by water for the year ending December 31 are reported as follows:

	1900.	1901.	Changes.
Gold bullion .....	\$361,248	\$3,989,267	I. \$3,628,019
Gold coin .....	24,507,268	13,490,788	D. 11,016,480
Total gold .....	\$24,868,516	\$17,460,055	D. \$7,408,461
Silver bullion .....	\$2,285,782	\$2,789,874	I. \$504,092
Silver coin .....	738,014	518,427	D. 219,587
Total silver .....	\$3,023,796	\$3,308,301	I. \$284,505
Totals .....	\$27,892,312	\$20,768,356	D. \$7,123,956

The receipts in 1901 were from the following sources: Mexico, \$3,878,539; Central America, \$94,678; South America, \$114,767; British Columbia, \$120,658; Australia, \$12,458,075; Japan, \$4,039,943; China, \$46,219; Miscellaneous, \$15,447.

The coinage executed at the mints of the United States in January is reported by the Bureau of the Mint as below:

Denomination.	1901.		1902.	
	Pieces.	Value.	Pieces.	Value.
Double eagles .....	.....	.....	383,000	\$7,660,000
Eagles .....	750,770	\$7,507,700	.....	.....
Half eagles .....	1,029,900	\$5,149,500	.....	.....
Total gold .....	1,780,670	\$12,657,200	383,000	\$7,660,000
Dollars .....	2,198,000	2,198,000	2,300,000	2,300,000
Half dollars .....	416,000	208,000	413,274	206,637
Quarter dollars .....	444,000	111,000	1,280,000	320,000
Dimes .....	1,960,000	196,000	820,000	82,000
Total silver .....	5,018,000	\$2,713,000	4,813,274	\$2,908,637
Five c. nickels .....	2,121,000	116,050	2,120,000	106,000
One c. bronze .....	3,743,000	37,430	8,391,000	83,910
Total minor .....	5,864,000	\$153,480	10,511,000	\$189,910
Total coinage .....	12,662,670	\$15,523,680	15,707,274	\$10,758,547

The decrease in the total coinage this year is equal to \$4,765,133, or 31 per cent, all in gold.

The Treasury Department's estimate of the amount and kinds of money in the United States on February 1 is as follows:

	Total.	In Treasury.	In Circulation.
Gold coin (inc. bullion in Treasury) .....	\$1,181,279,087	\$239,040,401	\$634,733,847
Gold certificates .....	.....	.....	307,594,839
Silver dollars .....	533,057,617	18,750,264	71,295,873
Silver certificates .....	.....	.....	443,011,489
Subsidiary silver .....	92,206,926	8,364,087	83,842,839
Treasury notes of 1890 .....	37,533,000	89,476	37,443,524
U. S. notes .....	346,681,016	10,999,371	335,681,645
*Currency certs. .....	.....	.....	.....
Nat. Bank notes .....	359,444,615	13,000,953	346,437,662
Total .....	\$2,550,202,261	\$290,250,552	\$2,259,951,709

Population of the United States February 1, 1902, estimated at 78,550,000; circulation per capita, \$28.77. For redemption of outstanding certificates an exact equivalent in amount of the appropriate kinds of money is held in the treasury, and is not included in the account of money held as assets of the Government. This statement of money held in the treasury as assets of the Government does not include deposits of public money in national bank depositories to the credit of the Treasurer of the United States, and amounting to \$106,639,952. The amount reported in circulation on February 1 is \$9,323,719 greater than on January 1; and \$69,171,496 greater than on February 1, 1901.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars .....	\$0.44 1/4	\$0.44
Peruvian soles and Chilean pesos .....	40	44
Victory sovereigns .....	4.85	4.88
Twenty francs .....	3.84	3.88
Twenty marks .....	4.73	4.85
Spanish 25 pesetas .....	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

Jan. Feb.	Silver			Copper			Spelter		
	Sterling E. change	N. Y. Cts.	London Pence.	Lake Cts. per lb.	Electrolytic per lb.	London per ton.	Lead per lb.	N. Y. Cts.	St. L. Cts.
31	4.86 1/2	53 1/8	25 7/8	12 1/4 @ 13	12 3/4 @ 12 3/4	55 24	4.05 @ 4.10	4.15	4.00
1	4.87 1/2	53 1/8	25 7/8	12 1/4 @ 13	12 3/4 @ 12 3/4	24 1/2	4.05 @ 4.10	4.10	3.95
3	4.87 1/2	53 1/8	25 7/8	12 1/4 @ 13	12 3/4 @ 12 3/4	56 1/2 24 1/2	4.05 @ 4.10	4.05	3.90
4	4.87 1/2	53 1/8	25 7/8	12 1/4 @ 13	12 3/4 @ 12 3/4	53 1/2 24 1/2	4.05 @ 4.10	4.05	3.90
5	4.87 1/2	53 1/8	25 7/8	12 1/4 @ 13	12 3/4 @ 12 3/4	53 24	4.05 @ 4.10	4.05	3.90
6	4.87	53 1/8	25 7/8	12 1/4 @ 13	12 3/4 @ 12 3/4	54 1/2 24 1/2	4.05 @ 4.10	4.05	3.90

London quotations are per long ton, (2,240 lbs.) standard copper, which is now the equivalent of the former g. m. b's. The New York quotations for electrolytic copper are for cakes, ingots or wirebars; the price of electrolytic cathodes, is usually 0.25c lower than these figures.

**Copper.**—The excitement prevailing last week has given way to a somewhat easier tone, but there appears to be a strong undercurrent to the market, and values have been well maintained. Consumers, generally, report a good inquiry for manufactured goods. We quote Lake copper at 12 1/2 @ 12 3/4 c.; electrolytic in ingots, cakes and wirebars at 12 1/4 @ 12 1/2 c., in cathodes at 12 @ 12 1/4 c.; casting copper at 12 1/4 @ 12 1/2 c.

The foreign market, which closed on Friday at £55, advanced on Monday to £56, re-acted to £53, but the close is again firm at £54 15s. @ £55 for spot, £54 15s. @ £55 for three months.

Statistics for the second half of January show an increase in the visible supplies of 1,200 tons.

Refined and manufactured sorts we quote: English tough, £60 @ £60 10s.; best selected, £62 @ £62 10s.; strong sheets, £70 @ £71; India sheets, £69 @ £70; yellow metal, 6 1/2 @ 6 1/2 d.

Exports of copper from New York, Baltimore and Philadelphia in the week ending February 5, as reported by our special correspondents were: To Great Britain, 2,390 tons; Germany, 699; Holland, 1,232; Belgium, 968; Austria, 45; Italy, 50; Manila, 1; total, 5,385 tons. Also 1,092 tons matte to Great Britain.

Imports were 932 tons.

**Tin.**—Has been influenced by the firmer tendency of the copper market, and business has been more active. At the close, spot is selling at 24 1/4 @ 24 1/2 c.; March, 24 1/2 c.; April, 24c.

The foreign market, which closed last week at £109, opened on Monday at £110 5s., declined on Wednesday to £109, and the closing quotations on Thursday are cabled as £111 12s. 6d. @ £111 15s. for spot, £106 @ £106 2s. 6d. for three months.

Statistics for the month of January show an increase in the visible supplies of 700 tons.

Visible stocks of tin on February 1 are reported as below on February 1, in long tons, of 2,240 lbs:

	Store.	Afloat.	Totals.
London .....	5,648	2,521	8,169
Holland .....	2,741	575	3,316
U. S., exc. Pacific ports .....	2,691	4,175	6,866
Totals .....	11,080	7,271	18,351

The stocks reported February 1, 1901, were 18,353 tons, or almost exactly the same as this year.

**Lead.**—Has been in good demand throughout the week. The closing quotations are 3.97 1/2 @ 4.05c. St. Louis, 4.05 @ 4.10c. New York.

The foreign market has displayed considerable strength, inquiry on the part of consumers being quite good. The closing quotations are cabled as £11 8s. 9d. @ £11 11s. 3d. for Spanish lead, £11 11s. 3d. @ £11 13s. 9d. for English lead.

**St. Louis Lead Market.**—The John Wahl Commission Company telegraphs us as follows: Lead is strong, but quiet. Missouri soft lead brings 4 @ 4.02 1/2 c. per lb., while argentiferous lead is quoted at 4.05c.

**Spelter.**—Shows a further decline in values. Consumptive demand, however, is very satisfactory indeed for prompt as well as future deliveries. The closing quotations are 3.90c. St. Louis, 4.05c. New York.

The foreign market continues to advance, good ordinaries being quoted at £17 10s. @ £17 15s. specials at £17 15s. @ £17 17s. 6d.

**St. Louis Spelter Market.**—The John Wahl Commission Company telegraphs us as follows: Spelter is demoralized and largely lower. Rumor has it that both prompt and future prime Western spelter can be bought as low as 3.90c.

**Silesian Spelter Market.**—Herr Paul Speier reports under date of January 23 that the production of spelter by works in Upper Silesia in 1901 was 107,045 metric tons, against 102,214 tons in 1900; an increase

of 4,831 tons, or 4.8 per cent. Increased production, with decreasing consumption, has not been favorable to prices, which dropped during the year and closed at 16.25 @ 16.50 marks per 50 kilograms, f. o. b. cars at Breslau. This is equal to 3.56c. per pound. Imports and exports in Germany for the year were, in metric tons:

	Imports—		Exports—	
	1900.	1901.	1900.	1901.
Spelter .....	45,517	40,360	100,605	106,626
Zinc sheets .....	290	611	33,418	33,034
Scrap zinc .....	310	2,139	3,192	2,355
Zinc white .....	9,743	7,309	29,817	33,527
Lithopone .....	26	36	11,640	14,874
Zinc ore .....	137,965	151,067	69,881	82,064

The larger items of spelter exports in 1901 were: Great Britain, 36,369 tons; Austria Hungary, 29,191 tons; Russia, 22,318 tons; Italy, 4,496 tons; Holland, 3,481 tons; France, 3,404 tons; Sweden, 2,225 tons.

**Antimony.**—Is rather easier in tone. We quote Cookson's at 10c., Hallett's at 8c., Hungarian, Japanese, Italian and U. S. Star at 7 1/2 c.

**Nickel.**—The price continues firm at 50 @ 60c. per lb., according to size and terms of order.

**Platinum.**—Consumption continues good. Ingot platinum in large lots brings \$19.50 per oz., in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 82c. per gram.

**Quicksilver.**—The New York price continues \$48 per flask for large lots, with a slightly higher figure for small orders. In San Francisco quotations are a little firmer, \$47.75 @ \$48 for domestic orders, and \$44 for export. The London price is £8 15s. per flask, with the same figure quoted from second hands.

**Minor Metals and Alloys.**—Wholesale prices, f. o. b. works, are as follows:

Aluminum.	Per lb.	Aluminum.	Per lb.
No. 1, 99% ingots .....	33 @ 34c.	Ferro-Tungsten (37%) .....	28c.
No. 2, 90% ingots .....	31 @ 34c.	Magnesium .....	\$2.75
Roller sheets .....	4c. up	Manganese (over 90%) .....	1.00
Alum-bronze .....	20 @ 23c.	Mangan'e Cop. (20% Mn) .....	32c.
Nickel-alum. .....	33 @ 39c.	Mangan'e Cop. (30% Mn) .....	38c.
Bismuth .....	\$1.50	Molybdenum (Best) .....	\$1.82
Chromium (over 90%) .....	1.00	Phosphorus .....	50c.
Copper, red oxide .....	50c.	American .....	70c.
Ferro-Molyb'dum (50%) .....	\$1.25	Sodium metal .....	50c.
Ferro-Titanium (10%) .....	90c.	Tungsten (Best) .....	62c.
Ferro-titanium (20%) .....	\$1.10		

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

Average Prices of Metals per lb., New York

Month.	Tin.		Lead.		Spelter.	
	1902.	1901.	1902.	1901.	1902.	1901.
January .....	23.54	26.51	4.000	4.350	4.27	4.13
February .....	.....	26.68	.....	4.350	.....	4.01
March .....	.....	26.03	.....	4.350	.....	3.91
April .....	.....	25.93	.....	4.350	.....	3.98
May .....	.....	27.12	.....	4.350	.....	4.04
June .....	.....	28.60	.....	4.350	.....	3.99
July .....	.....	27.85	.....	4.350	.....	3.95
August .....	.....	26.78	.....	4.350	.....	3.99
September .....	.....	25.31	.....	4.350	.....	4.08
October .....	.....	26.62	.....	4.350	.....	4.23
November .....	.....	26.67	.....	4.350	.....	4.29
December .....	.....	24.36	.....	4.153	.....	4.31
Year .....	.....	26.54	.....	4.334	.....	4.08

Average Prices of Copper.

Month.	New York			London—Standard.	
	Electrolytic.	Lake.	1901.	1902.	1901.
January .....	11.053	16.25	11.322	16.77	48.43
February .....	.....	16.38	.....	16.90	71.17
March .....	.....	16.42	.....	16.94	69.54
April .....	.....	16.43	.....	16.94	69.61
May .....	.....	16.41	.....	16.94	69.66
June .....	.....	16.38	.....	16.90	68.83
July .....	.....	16.31	.....	16.61	67.66
August .....	.....	16.25	.....	16.50	66.34
September .....	.....	16.25	.....	16.54	65.97
October .....	.....	16.25	.....	16.60	64.11
November .....	.....	16.224	.....	16.33	64.51
December .....	.....	13.845	.....	14.36	52.34
Year .....	.....	16.117	.....	16.53	66.79

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower.

Average Prices of Silver, per ounce Troy.

Month.	1902.		1901.		1900.	
	London.	N. Y.	London.	N. Y.	London.	N. Y.
January .....	25.62	55.56	28.97	62.82	27.30	59.30
February .....	.....	.....	28.13	61.06	27.49	59.76
March .....	.....	.....	27.04	60.63	27.59	59.81
April .....	.....	.....	27.30	59.29	27.41	59.39
May .....	.....	.....	27.43	59.64	27.56	59.96
June .....	.....	.....	27.42	59.57	27.81	60.42
July .....	.....	.....	26.96	58.46	28.23	61.25
August .....	.....	.....	26.94	58.37	28.13	61

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, listing companies and their prices for various dates from Jan. 30 to Feb. 5, 1902.

Coal and Industrial Stocks.

Table of coal and industrial stock quotations for New York, listing companies and their prices for various dates from Jan. 30 to Feb. 5, 1902.

PHILADELPHIA, PA. §

Table of stock quotations for Philadelphia, PA, listing companies and their prices for various dates from Jan. 30 to Feb. 5, 1902.

MEXICO.

Jan. 25.

Table of stock quotations for Mexico, listing companies and their prices for Jan. 25, 1902.

BOSTON, MASS.

Table of stock quotations for Boston, Mass., listing companies and their prices for various dates from Jan. 30 to Feb. 5, 1902.

ST. LOUIS, MO.\*

Feb. 3.

Table of stock quotations for St. Louis, MO, listing companies and their prices for Feb. 3, 1902.

SPOKANE, WASH.

Jan. 31.

Table of stock quotations for Spokane, Wash., listing companies and their prices for Jan. 31, 1902.

SALT LAKE CITY.\*

Jan. 25.

Table of stock quotations for Salt Lake City, listing companies and their prices for Jan. 25, 1902.

\*By our Special Correspondent. Total number of shares sold, 382,755



STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Table of stock quotations for Colorado Springs, Colo., listing companies like Acacia, Alamo, Am. Con., etc., with columns for par value, high/low prices, and sales.

Total sales 425,206 shares.

Colorado Springs (By Telegraph.)

Table of stock quotations for Colorado Springs (By Telegraph), listing companies like Acacia, Alamo, Am. Con., etc., with columns for par value, high/low prices, and sales.

MONTREAL, CANADA.

Feb. 3.

Table of stock quotations for Montreal, Canada, listing companies like Big Three, California, Can. Gold Fields, etc., with columns for par value, high/low prices, and sales.

LONDON.

Jan. 23.

Table of stock quotations for London, listing companies like Alaska-Treadwell, Anaconda, Copiapo, etc., with columns for authorized capital, par value, last dividend, and quotations.

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver. Fx.—dividend.

PARIS.

Jan. 23.

Table of stock quotations for Paris, listing companies like Acieries de Creusot, Firminy, Huta-Bank, etc., with columns for country, product, capital stock, par value, latest prices, and opening/closing prices.

TORONTO, ONT.

Table of stock quotations for Toronto, Ont., listing companies like Ontario, Golden Star, British Columbia, etc., with columns for par value, high/low prices, and sales.

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES.

Abrasive—		Cust. Meas.	Price.	Barium—		Cust. Meas.	Price	Graphite—Am. f.o.b. Provi-		Cust. Meas.	Price	Paints and Colors—		Cust. Meas.	Price
Carborandum, f.o.b. Niagara Falls, Powd., F. F. F. F.	lb.		\$0.08	Oxide, Am. hyd. cryst.	lb.		\$0.02 1/2	dence, R. L. lump	sh. ton		8.00	Metallic, brown	sh. ton		\$19.00
Grains	"		.10	Sulphate (Blanc Fixe)	"		.02	Pulverized	"		30.00	Red	"		16.00
Corundum, N. C.	"		.07@.10	<b>Barytes—</b>				German, som. pulv.	lb.		.01 1/4@.01 1/2	Ocher, Am. common	"		9.25@10.00
Chester, Mass.	"		.04 1/2@.05	Am. Crude, No. 1	sh. ton		9.00	Best pulverized	"		.01 1/2@.02	Best	"		21.25@25.00
Barry's Bay, Ont.	"		.07 1/2@.09 1/4	Crude, No. 2	"		9.00	Ceylon, common pulv.	"		.02 3/4@.03 1/2	Dutch, washed	lb.		.04 1/2
Crushed Steel, f.o.b. Pittsburg	"		.05 1/2	Crude, No. 3	"		7.75	Best pulverized	"		.04@.08	French, washed	"		.01 1/4@.01 3/4
Emery, Turkish flour, in kegs	"		.09 1/2	German, gray	"		14.50	Italian, pulv.	"		.01 1/4	Orange mineral, Am.	"		.07 1/4@.07 1/2
Grains, in kegs	"		.05@.05 1/2	Snow white	"		17.00	<b>Gypsum—Ground</b>	sh. ton		8.00@8.50	Foreign, as to make	"		.08@.11 1/4
Naxos flour, in kegs	"		.09 1/2	<b>Bauxite—Ga. or Ala. mines:</b>				Fertilizer	"		7.00	Paris green, pure, bulk	"		.11 @.11 1/4
Grains, in kegs	"		.05@.05 1/2	First grade	lg. ton		5.50	Rock	lg. ton		4.00	Red lead, American	"		.05 1/4@.05 1/2
Chester flour, in kegs	"		.09 1/2	Second grade	"		4.75	English and French	"		14.00@16.00	Foreign	"		.06 3/4@.08 1/2
Grains, in kegs	"		.05@.05 1/2	<b>Bismuth—Subnitrate</b>	lb.		1.40	<b>Infusorial Earth—Ground</b>				Turpentine, spirits	gal.		.41 1/2
Peekskill, f.o.b. Easton, Pa., flour, in kegs	"		.01 1/2	Subcarbonate	"		1.65	American, best	"		20.00	White lead, Am. dry	lb.		.04 1/4@.04 1/2
Grains, in kegs	"		.02 1/2	<b>Bitumen—"B"</b>	"		.08 1/2	French	"		37.50	American, in oil	"		.03 1/2@.05 1/4
Crude, ex-ship N. Y.: Abbott (Turkey)	lg. ton		26.50@30.00	"A"	"		.05	German	"		40.00	Foreign, in oil	"		.07 1/4@.09 1/4
Kuluk (Turkey)	"		22.00@24.00	<b>Bone Ash</b>	"		.02 1/4@.02 1/2	<b>Iodine—Crude</b>	100 lbs.		2.45	Zinc, white, Am. ex dry	"		.04 1/2@.04 3/4
Naxos (Greek) h. gr.	"		.26.00	<b>Borax</b>	"		.07 1/4@.07 1/2	Oxide, pure copperas col.	"		.05@.10	American, red seal	"		.06 1/2
Garnet, as per quality	sh. ton		25.00@35.00	<b>Bromine</b>	"		.40	Purple-brown	"		.02	Green seal	"		.07
Pumice Stone, Am. powd.	lb.		.01 3/4@.02	<b>Cadmium—Metallic</b>	100 lbs.		2.00@2.50	Venetian red	"		.01@.01 1/2	Foreign, red seal, dry	"		.05 1/2@.08
Italian, powdered	"		.01 1/2	<b>Calcium—Acetate, gray</b>	"		1.25	Scale	"		.01@.03	Green seal, dry	"		.06 1/4@.08 1/2
Lump, per quality	"		.04@.40	"brown	"		.85	<b>Kaolin—(See Clay, China.)</b>				<b>Potash—</b>			
Rottenstone, ground	"		.02 1/2@.04 1/2	Carbide, ton lots f.o.b. Niagara Falls, N. Y. or Jersey City, N. J.	sh. ton		75.00	<b>Kryolith—(See Cryolite.)</b>				Caustic, ordinary	"		.04 1/2@.06
Lump, per quality	"		.06@.20	Carbonate, ppt.	lb.		.05	<b>Lead—Acetate, white</b>	"		.07 1/4@.08	Elect. (90%)	"		.06 1/2
Steel Emery, f.o.b. Pittsburg	"		.10@.30	Chloride, com'l.	100 lbs.		.75@.80	Brown	"		.06	<b>Potassium—</b>			
	"		.07	Best	"		1.00	Nitrate, com'l.	"		.08 1/4	Bicarbonate, cryst.	"		.08 1/4
<b>Acids—</b>				<b>Cement—</b>				Oxide, pure copperas col.	"		.05@.10	Powdered or gran.	"		.14
Boric, crystals	"		.10 1/4@.11	Portland, Am., 400 lbs.	bb. l.		1.70@2.20	Purple-brown	"		.02	Bichromate, Am.	"		.08 1/4
Powdered	"		.11 1/4@.11 1/2	Foreign	"		1.65@2.25	Venetian red	"		.01@.01 1/2	Scotch	"		.08 1/4@.09
Carbonic, liquid gas	"		.12 1/2	"Rosendale," 300 lbs.	"		.95	Scale	"		.01@.03	Carbonate, hydrated	"		.04@.04 1/2
Chromic, crude	"		.20	Slag cement, imported	"		1.65	<b>Lime—Com. abt. 250 lbs.</b>	bb. l.		.80	Calcined	"		.03 1/4@.03 1/2
Hydrofluoric, 36%	"		.05	<b>Ceresine—</b>				Finishing	"		.90	Chromate	"		.35
48%	"		.05	Orange and Yellow	lb.		.12	<b>Magnesite—Greece</b>				Cyanide (98@99%)	"		.24@.25
Best	"		.25	White	"		.13 1/2	Crude (95%)	lg. ton		6.50@7.00	Kalmit	"		9.05
Sulphurous, liquid anhy.	"		.08	<b>Chalk—Lump, bulk</b>	sh. ton		2.45	Calcined	sh. ton		14.00@15.00	Manure salt, 20%	100 lbs.		.66
<b>Alcohol—Grain</b>	gal.		2.53	Ppt. per quality	lb.		.03 1/4@.06	Bricks	M		170.00	Double Manure salt, 48@53%	"		1.12
Refined wood, 95@97%	"		.60@.65	<b>Chlorine—Liquid</b>	"		.30	Am. Bricks, f.o.b. Pittsburg	"		175.00	Muriate, 80@85%	"		1.83
Purified	"		1.20@1.50	Water	"		.10	<b>Magnesium—</b>				95%	"		1.86
<b>Alum—Lump</b>	100 lbs.		1.75	<b>Chrome Ore—</b>				Carbonate, light, fine pd.	lb.		.05	Permanganate	lb.		.09 1/4@.10 1/4
Ground	"		1.80	(50% ch.) ex-ship N. Y.	lg. ton		24.75	Blocks	"		.07@.09	Prussiate, yellow	"		.13 1/4@.13 3/4
Powdered	"		3.00	Sand, f.o.b. Baltimore	"		33.00	Chloride, com'l.	"		.01 1/2	Red	"		.37@.37 1/2
Chrome, com'l.	"		2.75@3.00	Bricks, f.o.b. Pittsburg	M		175.00	Fused	"		.20	Sulphate, 90%	100 lbs.		2.11
<b>Aluminum—</b>				<b>Clay, China—Am. com., ex-dock, N. Y.</b>	lg. ton		8.00	Nitrate	"		.60	Sylvinit	unit		36 1/4
Nitrate	lb.		1.50	Am. best, ex-dock, N. Y.	"		9.00	Sulphate	100 lbs.		.75@.95	<b>Quartz—(See Silica.)</b>			
Oxide, com'l. common	"		.06 1/2	English, common	"		12.00	<b>Manganese—Powdered,</b>				Salt—N. Y. com. fine	sh. ton		2.00
Best	"		.20	Best grade	"		17.00	70@75% binoxide	lb.		.01 1/4@.01 1/2	N. Y. agricultural	"		1.50
Pure	"		.80	Fire Clay, ordinary	sh. ton		4.25	Crude, pow'd.	"		.01 1/2@.02 1/4	<b>Salt-petre—Crude</b>	100 lbs.		3.50@3.55
Hydrated	100 lbs.		2.60	Best	"		6.00	75@85% binoxide	"		.02 1/4@.02 3/4	Refined	"		4.37 1/2@4.62 1/2
Sulphate, pure	"		1.50@2.00	Ship Clay	"		5.00	85@90% binoxide	"		.02 1/4@.03 1/4	<b>Silica—Best foreign</b>	lg. ton		10.00@11.00
Com'l.	"		1.15@1.25	<b>Coal Tar Pitch</b>	gal.		.08	90@95% binoxide	"		.03 1/4@.05 1/4	Ground quartz, ord.	sh. ton		6.00@8.00
<b>Ammonia—</b>				<b>Cobalt—Carbonate</b>	lb.		1.75	Carbonate	"		.16@.20	Best	"		12.00@13.00
Aqua, 16°	lb.		.03	Nitrate	"		1.50	Chloride	"		.04	Lump quartz	"		2.50@4.00
18°	"		.03 1/4	Oxide—Black	"		2.20@2.30	Ore, 50%, Foreign	unit		.22@.23	Glass sand	"		2.75
20°	"		.03 1/2	Gray	"		2.28@2.40	Domestic	"		.30	<b>Silver—Chloride</b>	oz.		.65
26°	"		.05 1/2	Small, blue ordinary	"		.08	Marble—Flour	sh. ton		6.00@7.00	Nitrate	"		.37 1/2
<b>Ammonium—</b>				Best	"		.20	<b>Mercury—Bichloride</b>	lb.		.77	Oxide	"		85@1.10
Carbonate, lump	"		.08 1/4@.08 1/2	<b>Copperas</b>	100 lbs.		.30@.35	<b>Mica—N. Y. gr'nd, coarse</b>	"		.03@.04	<b>Sodium—</b>			
Powdered	"		.09 1/4@.09 1/2	<b>Copper—Carbonate</b>	lb.		.18@.19	Fine	"		.04@.05	Bichromate	lb.		.06 1/4
Muriate, grain	"		.05 1/4	Chloride	"		.25	Sheets, N. C., 2x4 in.	"		.30	Chlorate, com'l.	"		.08 1/4@.09
Lump	"		.08 1/2	Nitrate, crystals	"		.35	3x3 in.	"		.80	Hyposulphite, Am.	100 lbs.		1.60@1.65
Nitrate, white, pure (99%)	"		.12	Oxide, com'l.	"		.19	3x4 in.	"		1.50	German	"		1.70@1.90
Phosphate, com'l.	"		.09	<b>Cryolite</b>	"		.06 1/4	4x4 in.	"		2.00	Peroxide	lb.		.45
Chem., pure	"		.60	<b>Explosives—</b>				6x6 in.	"		3.00	Phosphate	"		.02 1/2@.03
<b>Antimony—Glass</b>	"		.30@.40	Blasting powder, A.	25 lb. keg		2.65	<b>Mineral Wool—</b>				Com'l.	"		.05
Needle, lump	"		.05 1/2@.06	Blasting powder, B.	"		1.40	Slag, ordinary	sh. ton		19.00	Sulphate, com'l.	100 lb.		.77 1/2
Powdered, ordinary	"		.05 1/4@.07 1/4	"Rackarock," A.	lb.		.25	Selected	"		25.00	Sulphide	lb.		.01 1/4
Oxide, com'l. white, 95%	"		.09 1/2	"Rackarock," B.	"		.18	Rock, ordinary	"		32.00	Sulphite crystals	"		.02 1/2
Com'l. white, 99%	"		.12	Judson R. R. powder	"		.10	Selected	"		40.00	<b>Sulphur—Roll</b>	100 lbs.		1.85
Com'l. gray	"		.07	Dynamite (20% nitro-glycerine)	"		.13	Flowers, sublimed	"			Flour	"		1.90
Sulphuret com'l.	"		.16	(30% nitro-glycerine)	"		.14	<b>Nickel—Oxide, No. 1</b>	lb.		1.00	Flowers, sublimed	"		2.15
<b>Arsenic—White</b>	"		.03 1/2@.03 3/4	(40% nitro-glycerine)	"		.15	No. 2	"		.60	<b>Talc—N. C., 1st grade</b>	sh. ton		13.75
Red	"		.06 1/4@.07 1/4	(50% nitro-glycerine)	"		.16 1/2	Sulphate	"		.20@.21	N. Y., Fibrous, best	100 lbs.		10.20
<b>Asphaltum—</b>				(60% nitro-glycerine)	"		.18	<b>Oils—Black, reduced 29 gr.:</b>				French, best	"		1.25
Ventura, Cal.	sh. ton		32.00	(75% nitro-glycerine)	"		.21	25@30, cold test	gal.		.09 1/4@.10 1/4	Italian, best	"		1.62 1/2
Cuban	lb.		.01 1/4@.01 1/2	Glycerine for nitro (32 2-10° Be.)	"		.12 1/2@.13	15, cold test	"		.10 1/4@.11 1/4	<b>Tar—Regular</b>	bb. l.		1.95
Egyptian, crude	"		.05 1/4@.06	<b>Feldspar—Ground</b>	sh. ton		8.00@9.00	Zero	"		.11 1/4@.12 1/4	Oil barrels	"		3.65
Trinidad, refined	sh. ton		35.00	<b>Flint Pebbles—Danish, Best</b>	lg. ton		14.75	Summer	"		.09 1/4@.09 3/4	<b>Tin—Crystals</b>	lb.		.20@21 1/2
San Valentino (Italian)	lg. ton		16.00	French, Best	"		11.75	Cylinder, dark steam ref.	"		.08 1/4@.10 1/4	Oxide	"		.42
Seyssel (French), mastic	sh. ton		21.00	<b>Fluorspar—</b>				Dark, filtered	"		.11 1/4@.15 1/4	<b>Uranium—Oxide</b>	"		2.25@3.00
Gilsonite, Utah, ordinary	lb.		.03	Am. lump, 1st grade	sh. ton		\$14.40	Light filtered	"		.14 1/4@.17 1/4	Carbonate	"		.07@.09 1/4
Select	"		.03 1/4	2d grade	"		13.90	Extra cold test	"		.21 1/4@.26 1/4	Chloride	"		.05
<b>Barium—</b>				Gravel and crushed, 1st gr.	"		13.40	Gasoline, 86°@90°	"		.14@.19	Dust	"		.05 1/2@.07 1/4
Carb. Lump, 80@90%	sh. ton		25.00@27.50	Ground, 1st grade	"		12.40	Naphtha, crude, 68°@72°	bb. l.		9.05	Sulphate	"		