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DEPARTMENTS.

SPECIAL ANNOUNCEMENT.

The very fact that a distinguished engineer, in the prime of life and at the height of his professional success, abandons absolutely and permanently a lucrative practice to become editor of the leading technical publication of the important industry with which his name has been worthily associated, demonstrates the commanding position which modern technical journalism has attained in the twentieth century.

MR. T. A. RICKARD, who, on January 1, 1903, becomes editor of the THE ENGINEERING AND MINING JOURNAL, has not only always 'ived in a mining atmosphere, but his Cornish ancestors for five consecutive generations have been mining engineers.

Born in Italy in 1864, educated in Russia and England, graduating from the Royal School of Mines, since then in active practice in the United States, having more than once traveled around the world, visiting almost every country in which mining operations are carried on, and making a detailed examination of the principal mines, he is in touch with mining conditions in every part of the world.

Few men have a larger personal acquaintance among mining engineers, superintendents and those who direct great mining and metallurgical enterprises. In addition to this, Mr. Rickard is especially well read. To him literary work is a pleasure rather than a task. The readers of THE ENGINEERING ANL MINING JOURNAL are therefore to be felicitated on the changes which give the paper an editor with so extensive a practical experience and with the ability to present a technical subject in clear and vigorous English.

Mr. Rickard will be assisted by three associate editors, each of whom has been connected with the Journal for years.

MR. FREDERICK HOBART was for about ten years assistant to the late Mr. Rothwell, and had charge of the JOURNAL during Mr. Rothwell's last illness and for six months after his death. His experience in technical journalism extends over more than twenty years. Mr. Hobart has had, and will continue to have, special charge of the market and metal reports, the accuracy of which has made them, as is well known, the basis of settlements among business men for ores purchased and sold in the United States, Canada and Mexico.

DR. JOSEPH STRUTHERS, who from the position of associate editor succeeded Mr. Rothwell in the editorship of that excellent annual publication *The Mineral Industry*, will on January 1 become an associate editor of the JOURNAL, with particular charge of the collection of statistics and the preparation of statistical contributions, a work for which he is pre-eminently qualified. Dr. Struthers is a graduate of the Columbia School of Mines.

MR. SAMUEL SANFORD, whose province for the last five years has chiefly been the news columns, and who during that time has been thoroughly in touch with the coal mining industry, will pay particular attention to this subject, which just now is of especial interest to the readers of the JOURNAL. Mr. Sanford is a Harvard man.

In addition to this office staff of trained men, it has been arranged to secure the editorial assistance of a number of other specialists.

DR. ROSSITER W. RAYMOND, who was the first editor of the Journal, has been "Special Contributor" for a great many years, and has given such distinction to that title that it has been possible to enlist the co-operation in the same direction of other men of highest standing.

Among those who will thus prepare special articles are: MR. WALTER RENTON INGALLS, of Boston, an old and highly valued contributor of the Journal, and at one time an associate editor; Mr. Ingalls' specialty is metallurgy and metallurgical chemistry. MR. JOHN A. CHURCH, of New York, one of the very foremost men in the profession of mining engineering, who also many years ago was a member of the editorial staff; DR. R. A. F. PENROSE, JR., of Philadelphia, a mining engineer, geologist and writer of the highest reputation; MR. S. F. EMMONS, of the United States Geological Survey, Washington, the leading authority on geology in its application to precious metal mining; MR. WALTER HARVEY WEED, of Butte, also a member of the United States Geological Survey, who is one of the most original and active writers among the young authorities; MR. PHILIP ARGALL, of Denver, a mining engineer and metallurgist of the most practical kind; MR. A. G. CHARLETON, of London, president of the Institution of Mining and Metallurgy. In addition, DR. DAVID T. DAY has kindly consented to continue his interest in the JOURNAL, of which he has been editor, and he will also be one of the "special contributors."

Beyond this group of distinguished men the JOURNAL is able to look for cordial help, suggestion and advice from a large circle of mining engineers and metallurgists of the highest standing, who have recently become stockholders in the paper. While their individual holdings are, in every case, quite small, nevertheless their actual financial interest in the paper will, it is believed, place the JOURNAL in thorough touch with the profession all over the world. Three of these shareholders are in Johannesburg, two in Australia, eight in London, four in British Columbia, four in Butte, five in California, two in Salt Lake City, five in Mexico, twenty-two in various parts of Colorado, and the remainder in New York, Philadelphia and Boston. This geographical distribution speaks for itself.

From the foregoing it is apparent how widespread and diverse are the resources at the command of the Editor with which to maintain the reputation of THE ENGINEERING AND MINING JOURNAL as the leading mining periodical of the English-speaking world.

⚒

TO ENGINEERS VISITING NEW YORK.

A room for the exclusive use of visiting mining engineers is maintained at the New York office of THE ENGINEERING AND MINING JOURNAL. Visitors to the metropolis are cordially invited to take advantage of the facilities it offers, by having their mail addressed care of the JOURNAL and making its office their headquarters. The man-

agers of the branch offices will also be glad to welcome visiting engineers and to be of any service to them that they can.

⚒

DR. DAVID T. DAY has been obliged, by the urgent demands of his work on the Geological Survey, to retire from the connection which he has maintained with the ENGINEERING AND MINING JOURNAL for over a year past. Dr. Day retires with the best wishes of the management of the JOURNAL, and we are pleased to add that he has consented to remain, as stated elsewhere, upon our list of "special contributors."

⚒

IN CONSEQUENCE of the special work required in getting out a number of unusual size, and of difficulties attending a change in printing arrangements, this issue of the JOURNAL is delayed a day beyond the regular time. We trust, however, that next week it will reach our readers promptly.

⚒

GOLD HAS been going to Japan in considerable quantities this year, both from the United States and Great Britain. The exports from Great Britain for the nine months ending with September are given by the trade returns at $4,871,533, against $486,600 for the corresponding period in 1901. For the same time the exports from the United States were $1,845,316, against $2,950 last year. The increase in the British shipments this year was $4,384,933, and in our own, $1,842,366. The cause of this movement is not altogether clear; trade has been good, but merchandise imports into Japan have been quite as large as last year. It is probable that a gradual accumulation of gold by the Japanese Government has had much to do with the movement.

⚒

THE OPENING meeting of the Anthracite Coal Strike Commission was, of course, mainly formal, and its second meeting was devoted chiefly to arranging with the representatives of both parties for future work. The actual investigation of the conditions in the coal region begins this week, as we go to press, and the Commission evidently intends to push its work as fast as possible. It is to be regretted that at the second session some of the representatives of the operators showed a disposition to quibble over words, and to object and take exception after the manner of lawyers in a criminal court. This is not the spirit which will aid in the work of the Commission. It is however, in the line of the mistakes which the operators have heretofore made in conducting and presenting their case to the public We recently called attention to the opportunity lost by them, and we trust that in the subsequent proceedings before the Commission a more judicious course will be adopted.

⚒

SILVER SHIPMENTS to the East continue to show a decrease. The exports from Great Britain for the nine months ending September 30 are valued by the Board of Trade returns as in the table below. We have added to the values the approximate quantity of the metal, in ounces, taking the average value in the London market each year:

	1901.	1902.	Changes.
British East Indies	£5,989,806	£4,831,717	D. £1,158,089
China	710,801	189,235	D. 521,566
Japan	20,000	46,500	I. 26,500
Total, values ...	£6,720,607	£5,067,452	D. £1,653,155
Total, ounces ..	58,734,400	49,586,300	D. 9,148,100

This shows a decrease of 24.6 per cent in values, and of 15.6 per cent in quantity of metal; the average London price for the nine months having 3.07 pence lower this year than last. Exports to British India fell off 19.3 per cent in value, and those to China 73.4 per cent; and, while those to Japan more than doubled, their total was unimportant. In fact Japan has ceased to be a factor in the silver market. The Indian exports continue to show the effect of the short crops for several years past. Chinese demand will doubtless continue very light until the indemnity troubles are settled, and trade begins to resume its normal course.

⚒

IN THE FAR WEST the purchase of lead in ores is still made chiefly on the basis of the fire assay; in South-eastern Missouri nothing is used but the wet assay, commonly one of the volumetric methods. Chemists in Colorado and elsewhere employ the volumetric methods also, but in considering their results it is necessary to know whether they refer to "dry" lead or "wet" lead. Thus the same sample may show 23.2 per cent lead by fire assay and 26.4 per cent by wet assay (we quote an actual report). The inaccuracy of the fire assay for lead has long been recognized. Lead is incompletely reduced, and both lead and lead sulphide are volatile under the conditions by which the assay is performed; the extent to which such losses are compensated for by the reduction with the lead of antimony, bismuth, etc., depends on the character of the ore, so the result is a good deal of a guess anyway. The late H. van F. Furman stated that the buttons for several hundred lead assays showed an average of only 96 per cent Pb. However, in spite of the impurities in the buttons which are weighed up as lead, the result is almost always too low. The fact that the loss is higher in proportion to the lead of a low-grade ore than to that of a high-grade prevents the application of any corrective factor. There are some assayers who can obtain by careful work in the muffle results on favorable ores that are not far below the truth, but it is safe to say that the ordinary fire assay for lead is only an approximation, which is quite unreliable to base calculations on. It is high time to discard completely this inaccurate method and relegate it to the oblivion into which the fire assay for copper long since fell.

⚒

MINING DIVIDENDS.

The dividend payments in October by American mining and metallurgical companies were not as satisfactory as in previous months this year. The falling off is most marked in the industrial section. In all, 54 concerns paid $4,926,501, of which a considerable part is credited to the combinations. Since January the dividends distributed by 154 companies amount to the large total of $120,628,979. Of this amount the gold, silver, lead, copper, zinc and quicksilver properties furnished $23,197,633, or 19.2 per cent, and the industrial companies associated with the mineral industry, $97,431,346, or 80.8 per cent.

Dividends on copper stocks have been cut severely this year These properties paid $9,371,481, which is equal to 40.4 per cent of the total dividends declared by all metal mines.

The gold, silver and lead properties, which include the smelting and refining combinations, paid $12,859,185 this year. The majority of these companies pay dividends monthly or quarterly. Few zinc and quicksilver companies paid dividends.

In the industrial list, the largest payers were the iron and steel concerns, headed by the United States Steel Corporation, which is one of a small number of combinations that pay regular quarterly dividends on both the preferred and common stock. Of the $97,431,346 paid by industrial companies, those engaged in the iron and steel industry furnished $48,457,401, or nearly 50 per cent. Next in importance are the oil and natural gas companies, which paid $36,570,042, credited principally to the Standard Oil Company. The coal companies distributed $7,755,128, a good part of which was paid to the preferred stockholders in the Pittsburg combinations.

In addition to the above, there were paid by Mexican mines this year $1,666,821; one Central American, controlled in New York, $150,000; South American, $70,760; Canadian, $1,239,544; total, $3,127,125.

⚒

WESTERN SMELTER CHANGES.

The announcement of a change in the western management of the American Smelting and Refining Company will be a matter of general interest to the mining community. Heretofore there has been a local directorate, resident at Denver, which has consisted of Messrs. Jas. B. Grant, Dennis Sheedy, Franklin Guiterman, Edgar Newhouse and Karl Eilers. This executive committee practically consisted of the former chiefs of the principal smelters which came into the consolidation and, consequently, the membership represented a notable aggregate of metallurgical skill. It must have proved a cumbersome executive; large bodies move slowly, and in their movements they are apt to be undecided; in political life also, history has shown, that a cabinet of all the talents is not infrequently a failure. This may hold true in industrial operations likewise. In any event, the local executive committee is now abolished and in its place Messrs. Jas. B. Grant and Dennis Sheedy have become the western resident members of the general executive committee, which is the main governing body of the company, with headquarters in New York. It is also announced that Mr. Franklin Guiterman is to be general manager of the Colorado plants.

The personel of the management of an industrial concern exercising such a powerful influence on the well-being of the mining industry is a matter of great importance. Fairness, good sense and self-restraint are necessary to the continued adjustment of the delicate relations which subsist between the mine owner and the man to whom he sells his ore; misunderstandings between parties who, respectively, exploit and smelt the produce of the mine are hurtful not to the individual or the company alone but to the entire community dependent upon their activities. For this reason mutual consideration and reasonableness are required for the maintenance of successful business relations. The best kind of business is that which is profitable to both parties concerned.

It is only fair to say that the members of the new western executive are likely to bring about such a desirable result as has been indicated. Mr. Jas. B. Grant is known to be a just man, possessing an experience which is co-terminous with the smelting industry of Colorado and a knowledge of working conditions second to none. The new general manager has won a promotion which emphasizes the distinction of a career of great usefulness. Mr. Guiterman

deserves the regard in which he is held by the numerous mine managers with whom he has come in contact, and his appointment holds forth the promise of an amicable settlement of those nice questions of treatment charges which occasionally disturb the progress of development in western mining districts. Mining conditions in Colorado are going through one of those periods of readjustment to changing conditions which have characterized the history of that State in the past; this is true of the other regions adjacent to Colorado, and there is, therefore, a need for a generous policy on the part of the great smelting consolidation which now dominates the mining industry of a large part of the Rocky Mountain territory. The best guarantee for a policy of fair dealing is to be found in the business acumen of the Messrs. Guggenheim and the good sense of the distinguished metallurgists who will now regulate the purchase of ores in the central offices at Denver.

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MARKET CONDITIONS.

Iron and Steel.—The iron and steel markets are seriously affected by transportation difficulties and shortage in deliveries of fuel. A number of blast furnaces in the Central West are banked because it has been impossible to get coke; and some steel mills are closed down because they are unable to get pig iron. The trade is necessarily in a somewhat demoralized condition, and will remain so until there is some approach to a settlement of these transportation difficulties.

Copper.—The copper market continues quiet, with no material change. It is noticeable that, notwithstanding the adverse influences affecting the market, which are well understood, the small advances made from time to time are for the most part held, with only slight reactions.

Other Metals.—Tin continues to show more demand and a general improvement. Apparently consumers' stocks have been low, and they are obliged to purchase in order to meet immediate requirements.

Lead continues steady, with a large consumptive demand and no change in prices. It is understood that progress is being made with the new lead combination, but details are still lacking.

Spelter continues strong and firm in price, without any material change.

Silver remains dull, with no special feature. The falling off in Eastern purchases from London is noted elsewhere.

Coal.—The Western coal markets are still in a demoralized condition, owing to delays in transportation. The congestion of traffic on many of the railroad lines has not been relieved. As cold weather approaches and the demand for fuel increases, the complaints of scarcity of cars and delays in taking fuel from mines are heard on all sides. At present there is no prospect of more than partial relief from these conditions, and coal operators at many points have been obliged to limit their productions, because they cannot ship it, and their storage capacity has been exceeded. The Lake trade especially is in a bad way, and shippers have about given up the expectation of filling their contracts before the close of navigation.

The coal strike in Alabama has been settled, and the mines are all working full time. The local demand is very large, and the mines have all they can do to meet it, although railroad conditions are much better there than in the West. A short supply of coke is reported, due to the great activity of the furnaces.

The seaboard bituminous coal trade is losing the somewhat speculative character which it assumed for a time. As anthracite comes into the market more freely, the bituminous trade will resume its normal condition. Some complaints are being heard here also about delays in transportation.

Anthracite coal is beginning to be shipped, but naturally some time must elapse before it is in anything like full supply. Until then market reports must refer mainly to the settlement of the strike and its attendant changes.

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THE ANTHRACITE STRIKE COMMISSION.

The members of the commission appointed by President Roosevelt met at the White House in Washington on October 24, when they were received by the President. The work to be done by the commission was informally discussed. The President impressed upon the commission the importance of expedition, and informed the members that he had decided to appoint two assistants to the recorder to facilitate the work. He then presented to them their instructions, as follows:

"White House, Washington, Oct. 23, 1902.
"To the Anthracite Coal Strike Commission:

"Gentlemen—At the request both of the operators and of the miners, I have appointed you a commission to inquire into, consider and pass upon the questions in controversy in connection with the strike in the anthracite region, and the causes out of which the controversy arose. By the action you recommend, which the parties in interest have in advance consented to abide by, you will endeavor to establish the relations between the employers and the wage workers in the anthracite fields on a just and permanent basis, and, as far as possible, do away with any causes for the recurrence of such difficulties as those which you have been called in to settle. I submit to you herewith the published statement of the operators, following which I named you as the members of the commission. Mr. Wright being named as recorder; also the letter from Mr. Mitchell. I appointed Mr. Mosely and Mr. Neill as assistants to the recorder. "THEODORE ROOSEVELT."

The opening meeting was held at the office of the Bureau of Labor. Judge George Gray was chosen president of the commission. Notices were ordered sent to the mine operators and to John Mitchell, as representative of the United Mine Workers, to be present at the next meeting, which was fixed for Monday, October 27.

Subsequently it was announced that Col. Carroll D. Wright had been made a full member of the commission, with vote, as well as recorder. Of the two assistant recorders or secretaries, Edward A. Mosely is secretary of the Inter-State Commerce Commission; Dr. Neill, the other assistant recorder, is professor of Political Economy at the Catholic University, located near Washington.

The commission has adopted an official name, and has had its printing prepared, designating it as the Anthracite Coal Strike Commission.

The second formal meeting of the commission was held in Washington on Monday, October 27. In opening the proceedings, Judge Gray, the president of the commission, read the order of the President, creating the commission, and in a general way outlined the proceedure to be followed in the presentation of the issues. He stated that in accordance with the immemorial practice among English-speaking peoples, the commission would first receive the staements or demands of the miners, who were to be regarded for the purposes of this case as the prosecutors. The reply of the other side would then be heard, Judge Gray said, in order that the commission might have before it a definite issue.

Both parties were represented fully at the meeting. Besides Mr. Mitchell, District President Fahey and Dr. Walter Edward Weyl appeared for the miners. The coal carrying roads were represented as follows: President Baer, of the Philadelphia & Reading; E. B. Thomas, chairman of the Board of Pennsylvania Coal Company and of the Hillsdale Coal and Iron Company—the Erie properties; Alfred Walter, president of the Lehigh Valley; W. H. Truesdale, president of the Delaware, Lackawanna & Western; David Wilcox, vice-president of the Delaware & Hudson; John B. Herr, vice-president of the Scranton Coal Company and of the Elkhill Coal and Iron Company; J. B. Torrey, attorney for the Delaware & Hudson, and Francis I. Gowan, attorney for the Lehigh Valley Company.

The proceedings covered about two hours' time, and were given up entirely to a discussion of the time and method of proceeding with the prosposed investigation. The commission decided to begin its work on Thursday, October 23, the first days of the investigation to be devoted to a physical examination of the mines and the homes of the miners, starting in the vicinity of Scranton. The entire anthracite field will be covered.

At the conclusion of Judge Gray's remarks, President Mitchell announced that he had with him the formal demands made by the miners upon the operators, and at the suggestion of Judge Gray he read the statement of the miners' demands adopted by the Shamokin convention, the rejection of which resulted in the strike. This demand is: First, for an increase of 20 per cent in wages of those not engaged by the day; second, a reduction of 20 per cent in working hours of those engaged by the day; third, the payment for coal mined by weight at a minimum rate of 60 cents per ton of 2,240 pounds; fourth, a wage agreement between the operators and the miners for an adjustment of wages.

Mr. Baer, on the part of the coal operators, took exception to Mr. Mitchell's appearance before the commission as a representative of the Mine Workers' Union, but said that he had no objection to his presence as a representative of the strikers as such in their individual capacity. The commission made no attempt to settle the controversy, but it was made apparent that the recognition of the miners' union will be an important and knotty problem for the arbitrators. Mr. Baer said the operators would be prepared to meet the miners in the region and to assist in giving all information. Many of the individual operators are not represented, and they were not consulted and were not compromised by the letter he had written.

Judge Gray suggested that they could be represented.

Mr. Baer made a point of saying that the case of each coal company would be dealt with separately. He would contend for the sliding scale in the regulation of wages.

Mr. Thomas said he noticed that the word "arbitration" had been applied to the commission's work, while he wanted it considered as an investigation.

Judge Gray said the President's instruction settled that as an arbitration.

Mr. Thomas also urged that the conditions in each of the mining companies were different and could only be considered separately. He thought more progress could be made by a physical examination of the coal region. He thought that, as many of the interests involved in the controversy were represented in New York, some of the hearings should be held in that city.

The commission adjourned, after all parties had professed themselves ready to furnish all the facts and figures in their possession.

AUSTRIAN COAL TRADE.—The quantity of lignite exported from Austria and Hungary during the eight months ending with August last, amounted to only 4,687,065 tons, as compared with 5,446,699 tons in the corresponding eight months of 1901.

LEAD SMELTING WITHOUT FUEL.

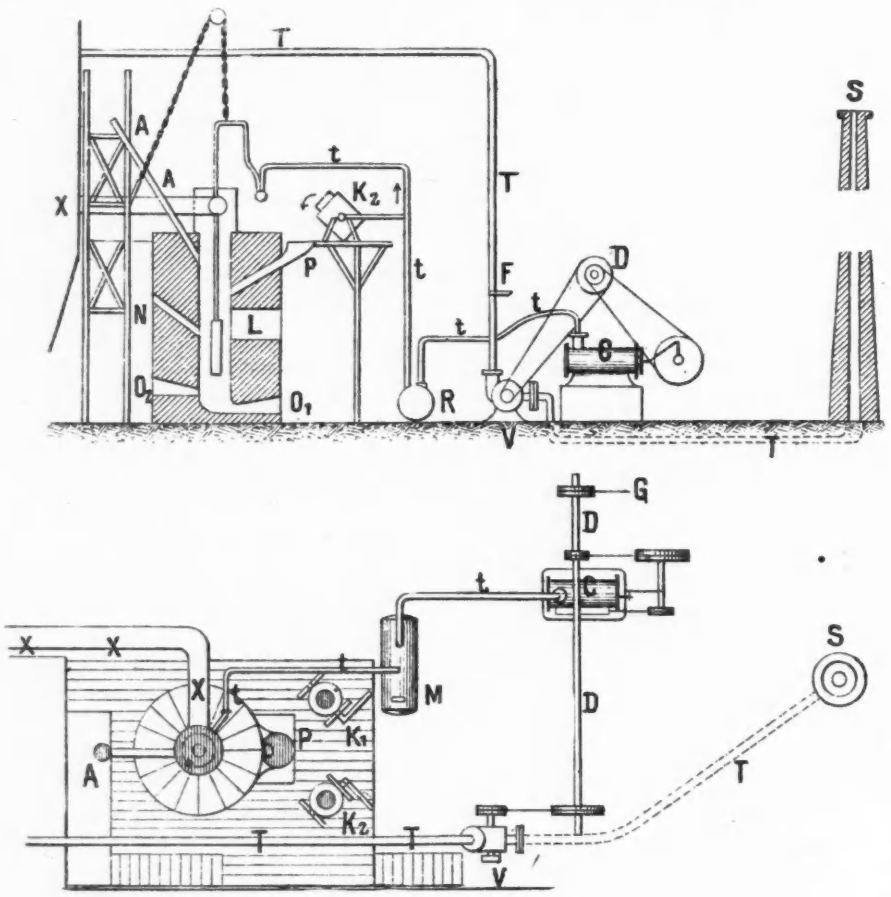
According to F. Laur, in the *Echo des Mines* (these notes are abstracted from *Oesterreiche Zeitschrift*, L., xl, 55,October 4, 1902), A. Germot, of Clichy, France, made experiments some years ago upon the production of white lead directly from galena. These led Catelin to attempt the recovery of metallic lead in a similar way. If air be blown in proper quantity into a fused mass of lead sulphide the following reaction takes place:

$$2\,PbS + 2\,O = SO_2 + Pb + PbS.$$

Thus one-half of the lead is reduced, and it is found collects all the silver of the ore; the other half is sublimed as lead sulphide, which is free from silver. The reaction is exothermic to the extent that the burning of one-half the sulphur of a charge should theoretically develop sufficient heat to volatilze half of the charge and smelt the other half. This is almost done in practice with very rich galena, but not so with poorer ore. The temperature of the furnace must be maintained at about 1100° C. throughout the whole operation, and there are the usual losses of heat by radiation, absorption by the nitrogen of the air, etc. Deficiencies in heat are supplied by burning some of the ore to white lead, which is mixed with the black fume (PbS) and by the well known reactions reduced to metal with evolution of sulphur dioxide. The final result is therefore the production of (1) pig lead enriched in silver; (2) pig lead free from silver; (3) a leady slag; and (4) sulphur dioxide. In the case of ores containing less than 75 per cent Pb the gangue forms first a little skin and then a thick hard crust which soon interferes with the operation, especially if the ore be zinkiferous. This difficulty is overcome by increasing the temperature or by fluxing the ore so as to produce a fusable slag. A leady slag is always easily produced; this is the only by-product of the process. The theoretical reaction requires 600 cu. m. of air, assuming a delivery of 50 per cent from the blower, and at one atmosphere pressure involves the expenditure of 18 h.p. per 1,000 kg. of galena per hour.

The arrangement of the plant at Clichy is shown diagrammatically in the accompanying engraving. There is a round shaft furnace, 0.54 meters in diameter and 4.5 meters high. Power is supplied to the blower C through the pulley G and the shaft DD. The compressed air is accumulated in the reservoir R, whence it is conducted by the pipe tt to the tuyere which is suspended inside of the furnace by means of a chain, whereby it can be raised or lowered. O_1 and O_2 are tap-holes. L is a door and N an observation tube. A is the charge tube. X is the pipe which conveys the gas and fume to the condensation chambers. T is the pipe through which the waste gases are drawn. V is the exhauster and S is the chimney. K_1 and K_2 are tilting crucible furnaces for melting lead and galena.

After the furnace has been properly heated, 100 kg. of lead melted in K_1 are poured in through the cast iron pipe P, and after that about 200 kg. of pure, thoroughly melted galena from K_2. Ore containing 70 to 80 per cent Pb must be used for this purpose. The blast of air is then introduced into the molten galena, and from 1000 to 3000 kg. of ore is gradually charged in through the tube A. During this operation black fume (PbS) collects in the condensation chamber. All outlets are closed against the external air. If the air blast is properly adjusted, nothing but black fume is produced; if it begins to become light colored, charging is discontinued and the blast of air is shut off. Lead is then tapped through O_2, which is about 0.2 meter above the hearth, so there is always a bath of lead in the bottom of the furnace, but it is advisable now and then to tap off some through O_1, so as gradually to heat up the bottom of the furnace. Hearth accretions are also removed through O_1. The lead is tapped off through O_2 until matte appears. The tap hole is then closed, the tuyere is lowered and the blast is turned into the lead in order to oxidize it and completely desulphurize the sulphur combinations, which is quickly done. The oxide of lead is scorified as a very fusible slag, which is tapped off through O_2, and more ore is then charged in upon the lead bath and the cycle of operations is begun again.



PLAN AND ELEVATION OF SMELTING PLANT AT CLICHY.

AN ESTIMATE OF THE GOLD PRODUCTION AND LIFE OF THE MAIN REEF SERIES, WITWATERSRAND.*

BY THOMAS HAIGHT LEGGETT AND FREDERICK H. HATCH

Since the enormous resources of the Witwatersrand Gold-fields have been demonstrated by the successful results obtained in the first row of deep-level properties, various estimates have been made of the future total production, or, in other words, of the probable duration of these fields.

One of the earliest estimates made was that by Messrs. Hatch and Chalmers[1] in 1895, who forecast a production from the Witwatersrand generally within half a century of £700,000,000 sterling. For this estimate an average milling width of 3 feet was assumed for the whole Rand. The yield was averaged at 38s. per ton, and it was assumed that the reef would be worked down to a vertical depth of 3,500 feet. This estimate was practically adopted by Professor George F. Becker, who visited the Rand in 1896.

Mr. John Hays Hammond, in a paper on Gold Mining in the Transvaal, read at the Richmond Meeting of the American Institute of Mining Engineers in February, 1901, estimates a total production from the central section of the Rand of £600,000,000 and from the east and west sections of £200,000,000, in all £800,000,000, and further puts "the future duration of profitable operations on a large scale in the district at less, rather than more, than 25 years."[2] But as Mr. Hammond assumes that profitable mining will be carried on to a depth of 6,000 feet, and states that "there are no factors operating against mining on the Witwatersrand to a depth of at least 8,000 feet vertically," this estimate of the total production seems under the mark.

More sanguine views as to the probable total production are held by Mr. W. Bleloch,[3] who estimates the "gold available for practical mining in the area between Randfontein on the west and Holfontein on the east," £2,871,000,000. In this estimate the vertical depth to which mining will be carried is put at 7,000 feet for the richer central section of the Rand; at 3,000 feet for the Vogelstruis to Paarl-Central section; and at 6,000 feet for the remainder. This estimate, it will be seen, is three and a half times as great as Mr. Hammond's. The truth probably lies somewhere between these two extremes.

It has occurred to the present writers that it would be a useful piece of work to collate the facts on which such estimates can be based and thence to deduce as fair a one as is possible under the circumstances.

The geological character of the Witwatersrand conglomerates is now pretty well understood. The sheets of "banket" cropping out along the Rand with an east and west strike and a variable dip to the south have been proved to be gold-bearing for a distance along the strike of 47 miles. The continuity in depth of the conglomerate beds has been proved by several bore-holes, as follows:

	Feet.
Violet Bore-hole (dip of the Randfontein Series) to a depth of	1884
New Rand Mines (dip of the Aurora West) to a depth of	2040
Geduld (dip of the Modderfontein Series) to a depth of	2136
Rand Victoria (dip of the Simmer & Jack) to a depth of	2391
Bezuidenville (dip of the City & Suburban) to a depth of	3130
Angelo Deep (dip of the Angelo) to a depth of	3783
Turffontein (dip of the Village Main Reef) to a depth of	4887

The one point on which there is very little evidence is as to the gold contents of the conglomerate beds at these greater depths of 4,000

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* Abstract of paper read before the Institution of Mining and Metallurgy, London, October 16, 1902.

[1] *Gold Mines of the Rand*, p. 291 (Macmillan & Co.).

[2] On these figures it appears that Mr. Hammond assumes an average annual production for the next 25 years of £800,000,000 ÷ 25 = £32,000,000.

[3] *The New South Africa, London*, W. Heinemann, 1901.

to 5,000 feet. That they do carry gold at these depths is shown by the bore-hole assays, which, as might be expected, vary considerably in value; but to attempt to make any deductions as to the payability of the beds from half a dozen samples of cores from different sections of the Rand, miles apart, would be absurd. The assay plan of any Witwatersrand mine will show that the gold is very unevenly distributed, occurring in spots, patches and shoots, just as in quartz veins. The even grade of the Witwatersrand mines is only maintained by keeping the development well ahead of the mill, and drawing the ore from a number of stopes of different value. Therefore, the value per ton assumed for any section can only be determined by taking the tonnage crushed over a given period divided into the total value produced for that period.

The following estimate is based on the assumption that the Main Reef Series will be worked to a vertical depth of 6,000 feet.

It is a well-known fact that to-day mining ground on the Rand is changing hands at very high prices, where the reef lies at depths of 8,000 feet and over, and companies are in course of formation with the avowed object of developing these areas. In certain sections of the Rand, however, the nature of the reefs will probably prohibit their being worked even to 5,000 feet. It is, of course, impossible for any one to fix to-day the vertical depth to which mining will ultimately be carried, because of the many indeterminate factors entering into the problem. However, in order to estimate the gold production some limit of depth must be fixed, and as mining at 6,000 feet is to-day practically *un fait accompli*, and since reef lying at this depth can be worked out by means of inclines from vertical shafts but 4,000 to 5,000 feet in depth, the writers have for purposes of calculation adopted 6,000 feet, excepting on the eastern flank (Modderfontein-Geduld area) where, on account of the slight dip of the beds and the incomplete knowledge of their gold contents, a vertical depth of only 4,000 feet has been taken.

In making this estimate we have found it necessary to divide the total area under consideration—from Randfontein in the west to Modderfontein in the east, inclusive—into sections in order to give due weight to variability in yield and reef thickness.

The sections are the following:

1. Randfontein "A" Block inclusive, to Luipaardsvlei (West Boundary).
2. Luipaardsvlei (West Boundary) to Grey's Mijnpacht, inclusive.
3. West Roodepoort to Durban Roodepoort, inclusive.
4. Kimberley Roodepoort to Bantjes, inclusive.
5. Aurora West to Paarl Central, inclusive.
6. Langlaagte Royal to Crown Reef, inclusive.
7. Johannesburg Pioneer to City and Suburban, inclusive.
8. Meyer & Charlton to George Goch, inclusive.
9. Henry Nourse to Jumpers, inclusive.
10. Treasury to Glencairn, inclusive.
11. Knights to Balmoral, inclusive.
12. Ginsberg to Blue Sky, inclusive.
13. Chimes West to Modderfontein Extension, inclusive.

For each of these sections the following factors have been determined: (*a*) Average length of reef in feet along the strike. (*b*) Average "backs" (or length along the dip), in feet, down to a vertical depth of 6,000 feet. (*c*) Average milling width in feet. (*d*) Average percentage deduction for unpayable ground, dykes, safety pillars, etc. (*e*) Average yield per ton, in pound sterling.

The estimated total production of gold in pounds sterling for any section then is—

$$\left\{\frac{1 \times b \times c}{12} - d\right\} \times e$$

Factor *a* was obtained by measuring the mean distance between each pair of section lines. The divisor 12 is taken on the basis of 12 cubic feet to the ton.

Factor *b* was ascertained by measuring the "backs" of the reef on geological transverse sections made at intervals across the Witwatersrand beds.

Factor *c* was arrived at by averaging the milling widths of the working mines embraced in each section, the milling width being the width of the reef actually sent to the mill, as determined by deducting from the known stoping width a percentage equivalent to that of the waste rock sorted out.

Factor *d* is an arbitrary amount varying with the character of each section. In the richer mines a deduction of 5 to 10 per cent is deemed sufficient to cover losses due to dikes and safety pillars, etc.; while in some of the lowest grade mines as much as 30 to 50 per cent of the total reef tonnage must be discarded to allow for these losses and for poor zones.

Factor *e* is the average of the yield of the mines comprised in each section for the five years ending October, 1899, as given in the reports of the Chamber of Mines.

The following table shows the tonnage crushed and the total value of the yield for the mines comprised in each section; also the average value per ton milled—in short, factor *e*:

No. 1.—Average Yields, 1894-1899.

Section.	Total Tons Milled.	Total Value.	Value per Ton in Shillings.	Number of Mines.
No. 1.....	727,107	£1,343,310	36.95	4
2.....	973,140	1,733,655	35.62	9
3.....	1,422,840	3,049,769	42.87	6
4.....	178,440	221,370	24.81	2
5.....	1,465,358	2,103,989	28.72	8
6.....	3,030,500	5,770,070	38.13	5
7.....	4,405,416	12,237,864	55.56	12
8.....	1,752,838	2,827,816	32.27	4
9.....	1,994,712	4,581,111	45.93	5
10.....	6,808,877	12,159,848	35.72	11
11.....	624,581	862,451	27.62	2
12.....	1,059,888	2,334,042	44.04	4
13.....	1,378,164	2,095,770	30.41	5
Totals.....	25,821,861	£51,328,065	39.76	77

The figures given above are for the Main Reef Series only, and do not include yields from the Kimberley Battery, Rietfontein, Black, or other reefs, nor from any of the outlying districts, such as the Nigel, Heidelberg, or Klerksdorp.

Table No. 2 gives the estimated total production for each section:

No. 2.—Estimated Total Production of Each Section.

No.	Section. Extent.	Length along Reef in Miles.	Estimated Total Production.	Amount Produced to Dec. 31, 1901.	Estimated Future Production.
1	Randfontein "A" Block, inclusive, to West Boundary of Luipaardsvlei	5.464	£124,376,000	£1,627,637	£122,748,363
2	West Boundary of Luipaardsvlei to Grey's Mijnpacht, inclusive	4.924	115,847,000	2,192,840	113,654,160
3	West Roodepoort to Durban Roodeport, inclusive	2.273	33,059,000	4,347,032	28,711,968
4	Kimberley Roodepoort to Bantjes, inclusive	3.324	18,197,000	285,710	17,911,290
5	Aurora West to Paarl Central, inclusive	5.398	97,606,000	3,410,320	94,195,680
6	Langlaagte Royal to Crown Reef, inclusive	1.553	99,765,000	9,125,945	90,639,055
7	Johannesburg Pioneer to City & Suburban, inclusive	2.600	231,546,000	20,416,707	211,129,293
8	Meyer & Charlton to George Goch, inclusive	1.756	52,713,000	4,061,352	48,651,648
9	Henry Nourse to Jumpers, inclusive	2.197	94,705,000	5,934,616	88,770,384
10	Treasury to Glencairn, inclusive	3.750	213,423,000	16,606,250	196,816,750
11	Knights to Balmoral, inclusive	1.572	24,180,000	999,794	23,180,206
12	Ginsberg to Blue Sky, inclusive	4.015	107,112,000	2,462,667	104,649,333
13	Chimes West to Modderfontein Extension, inclusive	8.049	97,794,000	2,767,645	95,026,355
					£1,236,084,485
	Banks and Custom Works, etc.	....	.....	2,523,776	2,523,776
	Totals	46.875	£1,310,323,000	£76,762,291	£1,233,560,709

If it be safe to make any deduction as to the probable duration of mining operations upon a large scale from the foregoing figures, we must assume that the annual production will increase for a few years to a maximum, which will be maintained for a second period, and that there will be then a third period of decline. For the three years preceding the war, the average increase of production was at the rate of £4,000,000 per annum; the production for 1899 being at the rate of about £19,000,000. Allowing 18 months from January 1, 1902, for the industry to be restored to the conditions existing in August, 1899, a similar increase of production will bring the output to at least £30,000,000 per annum by June 30, 1906, and if this rate of production should be maintained from then on the total production of £1,233,560,709 would give a life from January 1, 1902, of 42½ years. But as the production will decline gradually instead of coming to a sudden stop, the life of the industry is likely to be prolonged for some considerable number of years beyond the period indicated. If, on the other hand, the annual output should exceed £30,000,000 for any considerable period, as is perhaps within the bounds of possibility, this would partially offset the extension of life due to the gradual decline of production.

It is possible that the yield from certain sections may not be as great as the estimated amount shown in the table, and again these amounts may be exceeded in other sections. Further, it must be borne in mind that this estimated total yield is vitally dependent upon mining being carried on to a vertical depth of 6,000 feet.

We are indebted to Mr. C. Horst (Member) for much valuable aid in collecting the statistical data necessary for the preparation of the tables in this paper.

THE DEVELOPMENT OF THE MODERN BY-PRODUCT COKE OVEN IN AMERICA.*

BY C. G. ATWATER.

Referring to the present standing of the industry, Mr. Atwater said that in the United Kingdom 8 per cent of the coal was coked in by-product coke ovens and 12 per cent is used in blast furnaces directly with the recovery of by-products. Therefore, 80 per cent of the coal coked was with a loss of by-products. This is in accordance with the estimate of Mr. George Beilby for 1898. The American figures given by the *Mineral Resources* for 1901 show that 5 per cent of the coal was coked in by-product ovens and 95 per cent in beehive ovens, with the loss of by-products.

In Germany the figures were only an approximation. The Otto Company had built over 13,000 coke ovens to date, of which practically 40 per cent were by-product ovens. Therefore, it might fairly be said that 60 per cent of the coal coked was with a loss of by-products. The ovens now in operation and course of construction in the United States and Canada amounted to 3,413. When in operation they will add about 3,000,000 net tons of coke annually to the present by-product coke production, which would then constitute 13 per cent of the total coke production.

The by-product coke ovens first built in this country were copied directly from those in successful operation abroad, but conditions under which they operated in this country have produced a development on different lines. The original type of the Otto-Hoffmann or vertical flue oven as built for the Cambria Steel Company, at

* Abstract of paper read at the New Haven meeting of the American Institute of Mining Engineers.

Johnstown, Pa., had been reproduced with but little deviation at the succeeding plants in Glassport, Sydney, Hamilton, Camden and Lebanon. The characteristics of this design were the vertical flues and the use of regenerators. The improvements consisted of automatic methods in coal and coke handling; the development of electrically operated labor saving devices and improvements in construction details.

The principle of division of gases to obtain a high power illuminating gas from the ovens has also been developed by Dr. F. Schniewind, notably at the Everett and Hamilton works. The use of coal compression as a method of dealing with some varieties of coal in order to obtain an improved coke has been tried at Sydney with success, and the method of operation was described in the paper.

The success of the under-fired principle, as introduced by the builders of the Otto-Hoffmann ovens in Germany, established the value of this method of firing and led to the modification of the type of oven to embody this principle, together with the use of regenerators and the consequent economy in gas consumption. The Schniewind type of oven was thus developed, of which the characteristics were the use of the under-fired principle and the entire separation of the regenerative chamber from the oven supporting structure, embodying the advantages of both systems. The ovens of this form were being installed at Wyandotte, Sparrow's Point, Sharon and Johnstown, of which views were shown illustrating the methods of construction employed.

The dressing by machinery of the brick used in the construction of the oven wall, the isolation of the regenerative chambers, the protection of the iron work from the heat of the oven and the use of construction sheds provided with traveling cranes were described.

Reference was also made to experiments on the progress of coking in the oven charge taken from data obtained in Germany and in Sydney, showing that the centre of the oven charge remains at a low temperature until about half the coking time has elapsed, the gas escaping up the walls of the oven and through the coked portion. Curves were shown indicating these temperatures by means of a lantern slide. There were also a number of other slides shown, illustrating the various points in the paper.

LEAD SMELTING IN KANSAS.—Ore from the Joplin District is smelted at one or two plants at Galena, Kan., which employ Scotch hearths. This process is cheap, and it gives directly a large proportion of the lead, but the loss in fume is high, unless it be recovered by an elaborate system of dust and condensing chambers, or by cooling and filtering through bags. Experience has shown that the Scotch hearth fume can be safely filtered through bags, although the latter are inapplicable to roasting furnaces. The cost of a bag house adds greatly to the expense of installing a Scotch hearth plant, which otherwise is very moderate. The condensed or filtered fume together with the gray slag from the furnaces constitute rich between-products, which must be smelted in blast furnaces. Considerable ore from the Joplin District used to find its way to the great smelting and refining plant at Argentine, which was closed down about a year ago, it was said then forever. Dismantling was begun, but according to a recent report this has been suspended, and the plant may now be remodeled and operated again. Practically all of the refining by the American Smelting and Refining Company is now done at Omaha, Chicago and Perth Amboy. The Cherokee-Lanyon Spelter Company is about to put in operation at its works near Iola, Kan., a small blast furnace to smelt for the recovery of their lead and silver contents the residua remaining after the distillation of the zinc from mixed ores in Sadtler lined retorts.

NOTES ON BREAKING GROUND.

By T. Lane Carter.

A good deal of experience with miners working on the contract system has shown me what a difference there is between a miner who understands how to break the maximum amount of rock with a maximum of expense, and one whose knowledge of the work is limited. In stopes, drives and raises I have seen men work for several months and then throw up the contract in disgust, being unable to make it pay. Better skilled miners have taken up the discarded contracts, and by their superior ability in breaking ground, have made big wages every month. There are few branches in mining where practical experience and observation count for so much as in this problem of breaking ground. Too much cannot be written on the subject, nor too many illustrations of actual working conditions given.

A close observation of the working faces is the best way to judge of the capabilities of a manager. A mine manager whose knowledge of breaking ground is theoretical only, will be greatly exceeded by a sucessor, skilled in making most use of explosives. It is for this reason that the college-bred manager sometimes makes so poor a showing compared with the man with great experience and common sense.

One of the first questions to decide, is the strength of explosive to be used, whether blasting gelatine, the most powerful, or a weaker, and

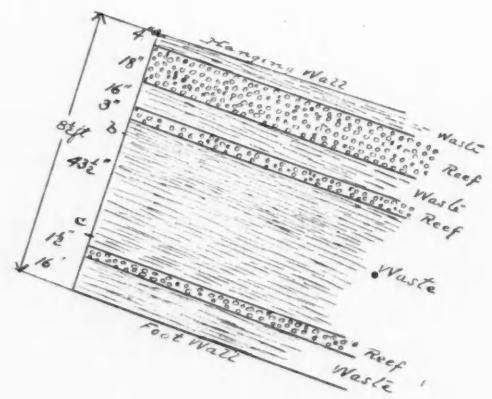

FIG. 1.

at the same time, cheaper article? This point cannot be decided off hand, but requires a good deal of experimenting. Blasting gelatine, as we know, allows the miner to take a maximum burden on each hole, but it also produces the maximum of "fires."

The sorting out of valueless waste rock is a big factor in the gold mining industry of the Witwatersrand. It is, of course, impossible to sort out fines, so the ore should have as small a proportion of rock in this state as possible. The objection to the production of fines varies considerably in the same mine. For instance, in a stope where there is almost solid reef, with little opportunity for sorting, blasting, gelatine can be advantageously employed, whereas in stopes on the South Reef, where the reef is narrow, the question of fines produced becomes an important one.

How are the reefs to be worked? At times this is a debatable question. The thick main reef series presents few difficulties, but there are instances when the South reef series, with its small bands of auriferous rock, has to be studied carefuly.

Take the cross sections of a South reef stope, Fig. 1, an illustration of a case that frequently happens in some portions of the Rand. A glance will show you what a big percentage of waste rock there will be from this stope. The general practice is to carry the whole stoping width of 8½ feet in one operation, depending on the sorting plant to throw out most of the waste rock. Experience is proving that this is not such a simple matter. In the first place, a big stope of this kind will produce 30 per cent and over of unsortable fines, in consequence of which the assay value over the stoping width shows up low.

A stope of this kind can be worked differently, whether advantageously or not must be decided in each case.

At first the rock is stoped from a top 45 inches wide. An extensive area having been worked out the miners come back and take up the barren section from b to c, the rock being either stored away in pack walls or sent to the waste pile. Then the narrow rich vein can be obtained almost pure. In mining barren rock overlying a rich stringer, it is well to place the holes parallel with the band rather than perpendicular to it.

An experience of some months in working with air drills, proved for me the superiority of the contract system in breaking ground. This is not the place for a description of the system as carried on here.

Suffice it to say, that in stoping the miner is paid a fixed price per square fathom stoped.

Miners working for so much per day seem to work with their hands only, making as little use as possible of their heads. An inspection of a stope on contract, and one on day's pay, is the most convincing argument in favor of the contract system. The day's pay man seems to have one object only, to get through his task for the day quickly, with no thought of the morrow. Consequently, he rigs up his two rock drills in the most convenient places, not with the idea of breaking the most rock, but of having the least trouble.

On the other hand, the efficient contractor looks weeks ahead, and in drilling places his holes with care, so that the blasts taken out to-day will help the work of the future. He soon makes up his mind in which direction it pays best to work his stope, whether up and down, parallel to the original raise, or diagonally across. After the direction is decided upon, the marking faces are broken up into a series of step-benches, which he takes care to keep in order. The benches are quite wide, 8 holes, 6 feet deep, being bored on a bench. This allows the blasting of two holes at a time, and holding the others in reserve. Suppose he charged up the 8 holes, and let off the whole lot. If the first two holes miss fire, then the outlay of explosives would be wasted.

It is an important matter at times to test the caps and fuses. Out of 13 holes I had to fire one day, only two went off, the poor fuse being responsible for the missfire.

With contractors, the most popular method of breaking ground, is to get the face into a series of benches, as I have mentioned. I have seen another method used, however, with great success. The contractor commenced a very large bench at the top of the stope and carried it right down. On the day for measuring I found the faces of the stope very straight, with only the large benches.

Another important point the miner on contract takes advantage of, is to keep the holes in the stope benches parallel with each other. The tendency of a lazy man is to drill four holes from the same side of the column supporting the air drill. The last two holes in this case are not as efficient as they would have been, had he turned the machine to the other side of the column, and drilled them parallel with the first two.

Besides, drilling four holes other than parallel soon destroys the efficiency of the step benches.

My experience has been that the miners on day's pay have to be very closely watched if ground is to be broken economically. Sometimes the most scientific way of working a face is not the easiest, and the miner will not take the trouble if he is not paid for it. The man on contract, however, knows that if he does not break as much ground as he possibly can there will be a sad tale to tell at the end of the month.

Occasionally the contractor in a stope resorts

to "chambering." On a bench that requires 4 holes, as Fig. 2, the burdens on holes 1 and 3, are made extra heavy, from 12 to 14 inches more than is allowed ordinarily. A stick or so of gelatine is placed in holes 1 and 3, and blasted, to form chambers at the bottom of the holes. In charging up for the blast 1 and 3 are considered the heavy holes, 1½ times as much dynamite being placed in them as in 2 and 4. The charges go off as follows: First 1, then 2, then 3, then 4. It requires close figuring to decide if the extra expenditure of dynamite is warranted, but there are times when chambering in a stope is a distinct advantage.

In a mine where blasting is allowed only once a shift, the system cannot be employed.

A miner might be successful in a stope, yet fail in sinking winzes. A case came to my notice

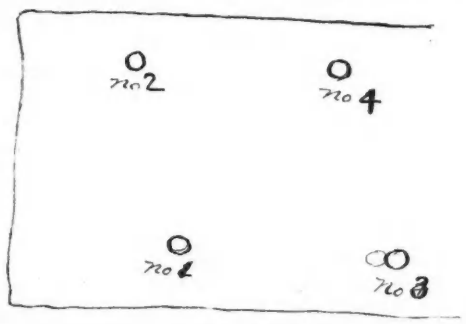

FIG. 2.

recently of two men who abandoned a contract for sinking winzes after a trial of three months. The contract was immediately taken up by two Australian miners, who made nearly twice as much money as the other party.

The case is illustrative of two methods of sinking winzes, and is important.

The first contractors went on the principle of keeping the winzes as narrow and low as possible. In making an advance of 3 feet a center cut, cone-shaped, was first taken out, then top, side, and lifting holes were drilled.

The second contractors worked on an entirely different basis. Instead of carrying the winzes 4 by 3 feet they opened them out to 4 by 6 feet in order to have ample room, and give the rock a chance to break. The method of first taking

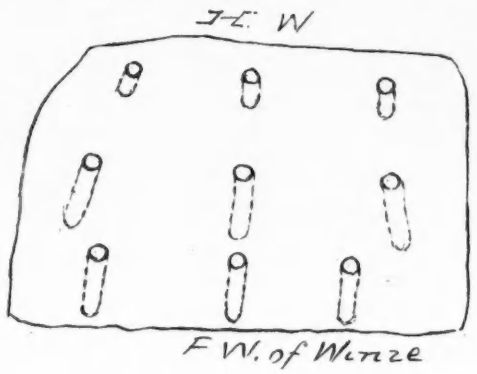

FIG. 3.

out a center cut was ignored. Their scheme was to undermine the foot wall, with short holes, and then drill others parallel, higher up. The method is illustrated in Fig. 3.

On account of the scarcity of natives, who are the hand drillers of the Rand, a good deal of machine "raising" is obligatory. Miners often make the mistake of carrying the raise up too small. Ordinarily more headway can be made in a raise if it is carried up, say 4 by 6 feet, than 4 by 4 feet. In the case of machine raising it is, of course, necessary to make use of the cone-shaped center cut.

All driving and cross-cutting, with very few exceptions, is done here by air drills. The secret of successful driving is the attention paid to the cone-shaped center cut. If it is made rather large, and cleaned out well, the round will be a satisfactory one. The skilled driver is ever on the lookout for every advantage the lay of the rock can afford him. The old method of carrying half the height of the drift forward 20 feet or so, and then blasting up the bottom has gone out of use on the Rand. For high tunnels, such as for railroads, this method is successful, but it is a mistake to apply it in a mine where the drives and cross-cuts are only 6 feet high.

In sinking incline shafts with machines two cone-shaped cuts are taken out first, whereas in sinking with hand labor the method illustrated in Fig. 3 is used.

It might be of interest to mention the way we set off our charges in the Witwatersrand mines. Before lighting up the miner provides himself with what he calls a "dynamite stick," made by wrapping pieces of blasting gelatine closely around a stick. Until required the stick is kept soaked in water.

The fuses are split, and a tiny piece of dynamite placed on the powder, to make sure that the fuse will catch fire quickly, when the time comes for blasting.

After shouting "Fire!" three times, the miner lights the dynamite stick, which bursts into a luminous blaze. The stick is then held to the fuses, and when he is sure they are alight, the miner runs to a place of safety. About four minutes elapse from the time of lighting to the explosion of the gelatine.

ZINC ORE IN BRITISH COLUMBIA.—There is considerable interest in the production of zinc ore in the Slocan District, and one of the Kansas smelters has lately sent a representative there to investigate the conditions. There are said to be numerous mines capable of producing zinc ore, but the high railway freights to points where smelting is conducted in the United States is at present against their development. One or two mines, including the Bosun and the Wakefield, have, however, been making some shipments to Europe.

A UTAH IRON PROPERTY.

The accompanying illustration is a reproduction of a photograph showing a cut made on the outcroppings of one of the claims included in the Iron Springs property in Iron County, Utah. This property has recently been the subject of an important deal, and it is said that active development work will soon be begun. C. W. Kimberly, representing the well-known mining and manufacturing interests of Peter Kimberly and Frank Buhl, of Sharon, Pa., has just concluded an examination and closed an option on 76 iron properties covering the Iron Springs mines. The location is in Iron County, about 250 miles south of Salt Lake City. The option payments will run for 10 years, and aggregate $2,250,000, the deal having been made through Richard Jones, of Salt Lake City. The deal also includes several valuable coal properties further south in the same district.

These iron deposits have been known for several years, and there is little doubt as to their extent and importance. Their development has been postponed by lack of transportation facilities, but these will be supplied by the new railroad line now under construction.

PINTO IRON CLAIM, SOUTHERN UTAH.

REDUCTION OF METALLIC COMPOUNDS BY CALCIUM CARBIDE.—The reactions involved in reduction by means of calcium carbide are discussed by B. Neumann, of Darmstadt, in a paper in *Zeitschrift fur Elektrochemie*, VIII, xl, 772 to 775, October 2, 1902. He refutes the criticism on his own work by von Kügelgen in the same journal, vol. VII, and shows that the reduction of the oxide of a univalent metal by means of calcium carbide results in the formation of carbon monoxide, not dioxide, and that one molecule of the carbide reduces only six atoms of the metal instead of 10 atoms. The two formulæ are as follows:

Neumann:

$$3\,M_2O + CaC_2 = 3\,M_2 + CaO + 2\,CO.$$

Von Kügelgen:

$$5\,M_2O + CaC_2 = 5\,M_2 + CaO + CO_2.$$

LITHOPHONE.

This compound should contain theoretically 29.4 per cent of zinc sulphide, but by using a larger proportion of barium sulphide than called for by the formula and precipitating the excess by another zinc salt, such as the chloride, or by sodium sulphate, mixtures containing a higher or lower percentage of zinc sulphide are thrown down. These are put up in Germany, where the manufacture is conducted on the largest scale, under seals, of different colors, each seal corresponding to a certain tenor of zinc sulphide. The chief makers have formed a ring and established a scale of prices ranging from 23 marks per 100 kilograms for 30 per cent zinc sulphide down to 16 marks for 16 per cent. The various grades differ not only in their zinc content, but also in their appearance, the best being pure white, while the inferior have slightly grayish or yellowish tints on account of the presence of carbon or ferric oxide. E. Kochs and F. Seyfert have recently published (*Zeitschrift fur angewandte Chemie*, 1902, XV, xxxii, 802 to 808) a description of their method of analysis. This consists substantially in the determination of total zinc by digesting the sample with chlorhydric acid and then the zinc as oxide by digesting another portion with dilute acetic acid, by which zinc sulphide is unaffected. The difference measures the zinc as sulphide. This is checked by determining the sulphur as sulphide by dissolving 1 gram of the sample with 50 to 75 c.c. of dilute chlorhydric acid (1:9 by volume) in a flask filled with carbon dioxide, a stream of the latter being passed through during the operation, and bubbling the gas through bromine water, after which the sulphur is precipitated with barium chloride in the usual manner. From this determination the percentage of zinc as sulphide is calculated. The result is usually 0.1 to 0.3 per cent lower than that obtained by difference and the mean of the two is taken. As a rule, not more than 0.5 to 2 per cent of zinc in other forms than sulphide is found, but bad samples have shown as much as 12 per cent. The presence of 1 or 2 per cent of zinc otherwise than as sulphide has little effect on the lithophone, but large proportions are objectionable, indicating defective methods of manufacture. Only a small percentage of the samples examined by these investigators contained the quantity of zinc sulphide supposed to be guaranteed by their seals. (The manufacture of lithophone is increasing considerably in Germany, as is manifested by the growing exportations. The United States imports some, but less than formerly. The manufacture having been undertaken here by various concerns, among others by the Graselli Chemical Company and the New Jersey Zinc Company. It is a white pigment, which is employed especially for enameling oilcloth, for which purpose it is well adapted, because of its flexibility; for enameling iron, etc. It has excellent covering properties, but has the disadvantage of being photogenic, becoming dark on exposure to the sunlight, though regaining its whiteness after removal from such exposure; consequently it is unsuited for out-door use.)

TREATMENT OF NICKEL-COPPER ORES.—Borchers and Günther propose (*Zeitschrift fur Elektrochemie*, VIII, xxxxix, 747, September 25, 1902) to smelt nickel-copper sulphide ore to a matte in the ordinary manner and then to reduce the matte to a nickel-copper alloy. The latter is to be electrolyzed in an acid solution of copper sulphate, according to Andrée's Deutsche Reichs Patent, No. 6048, yielding electrolytic copper, an anode slime consisting of Cu_2S, Cu_2O and the precious metals, and a solution of nickel sulphate. The latter is to be freed from cobalt and small quantities of iron by known methods (in the case of large quantity of iron by crystallization as described in *Jahrbuch der Elektrochemie*, IV, 305) and then electrolyzed hot, with lead and other metals in solutions of alkali salts, of which the anion will form soluble salts with the anode metal, whereby products which can be worked up to white lead, chrome yellow, etc., will be got at the anode and pure nickel at the cathode. This is conceived to offer advantages over the American method of tops and bottoms smelting.

MANUFACTURE OF MINIUM FROM LEAD PEROXIDE.—In Rontschewsky's process for the electrolysis of a solution of zinc sulphate with lead anodes (see *The Mineral Industry*, IX, 690) the anode reaction is utilized in the formation of lead peroxide. Aside from the manufacturers of lucifer matches, the largest consumers of lead peroxide are those who employ it simply as a carrier of oxygen, and after the oxygen has been given up regenerate the peroxide from the lower oxides which remain. Borchers and Dorsemagen have been investigating uses in which both the lead and oxygen will be consumed (*Zeitschrift fur Elektrochemie*, VIII, xxxix, 745, September 25, 1902) and especially the manufacture of minium (red lead) which is made by combining litharge and lead peroxide, according to the formula $2PbO + PbO_2 = Pb_3O_4$. The process described in the chemical hand-books, wherein the mixture is heated to about 450° C., does not succeed, the result being an off-color and technically useless product. It is well known that in the ordinary reverberatory furnace processes the best colored minium forms during the slow cooling of the lead oxidation products from a dark red heat. Dorsemagen investigated the question of temperature and found that the synthesis of minium from litharge and the peroxide could be effected successfully at about 250° C. From a mixture of the two constituents with a slight excess of litharge over the theoretical proportion, ground together wet, a product of beautiful red color was obtained without difficulty.

THE STEEL PLANT AT MONTEREY, MEXICO.*

By WILLIAM WHITE, JR.

History.—The making of iron and steel from the ores of northern Mexico was for years a favorite project of the late Don Patricio Milmo, upon whose estate large deposits of coal and iron were known to exist, and with whom Mr. Eugene Kelly, of New York, was associated.

Several expert examinations of the property were made for them, and when failing health forced Sr. Milmo to retire from active part in the matter, Mr. Kelly carried on the project and associated himself with Messrs. Vicente Ferrara, of Monterey; Antonio Basagoiti and Leon Signoret, of the City of Mexico, and other leading citizens of Mexico, Monterey and New York, who, in May, 1900, organized the Compania Fundidora de Fierro y Acero de Monterey, with a capital of $10,000,000.

The main reason for locating the plant at Monterey was that a circle drawn with Monterey as a center and the distance from Monterey to Laredo as a radius will contain all the known deposits of iron ore of bessemer quality and the greater part of the available coal in the republic. Moreover, Monterey is connected with all the Mexican trunk railroad lines, and possesses, therefore, cheapness in assembling the raw materials; means for wide distribution of the product, and a sufficiently large population to supply the necessary labor.

Iron Ore.—The company's iron mines are on the Carrizal Mountain, on the Mexican National, and at Monclova, on the Mexican International Railroad. At the former locality 2 mines, Piedra Iman and the Anillo de Hierro, sufficiently large to supply all present needs, are now under development. They are reached by a 5-mile branch from Golondrina station, on the Mexican National. The ore is brought to the loading terminal by 2 Bleichert tramways, arranged to load 1,000 tons per day.

The outcrop of the Piedra Iman is a ridge 79 feet wide and 300 feet high; that of the Anillo de Hierro is 120 feet wide. Developments indicate the persistence of the deposits in depth. A third very large deposit is the Cinco de Mayo, which will be developed as occasion requires. The ore of the Piedra Iman is magnetite; that of the Anillo de Hierro, hematite, and that of the Cinco de Mayo, brown hematite.

The analyses of the ores by Dr. Otto Wuth, of Pittsburg, are as follows:

Analyses of Mexican Iron Ores.

	Piedra Iman. Magnetite.	Anillo de Hierro. Hematite.	Cinco de Mayo. Brown Hematite.	Monclova. No. 1.	Monclova. No. 2.
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Silicic acid	5.41	2.42	2.90	2.51	3.85
Alumina	1.03	.79	1.12	1.51	1.04
Peroxide of iron. ...		96.22	78.86	95.05	93.42
Magnetic iron ..	90.83	....	....	....	....
Lime	1.93	.10	4.25	.28	.85
Magnesia	.42	trace	1.60	.12	.05
Peroxide of manganese	.25	.37	4.51	.43	.27
Sulphuric acid ...	trace	none	trace	trace	.47
Phosphoric acid .	.130	.101	.051	.101	.050
Copper	none	none	trace	....	....
Metallic iron	65.78	67.35	52.02	66.53	63.39
Phosphorus	.056	.044	.022	.044	.022

Coal.—The company owns 30,000 acres of the Laredo coal-field, and is largely interested in that of Barroteran. Developments made in the latter field by the Mexican Coal and Coke Company show a coal seam 9 feet thick and of a quality suitable to the manufacture of coke for blast furnaces.

Limestone.—Monterey is in a district which furnishes limestone of exceptional quality and in inexhaustible quantity.

Manganese.—Ores varying from 40 to 55 per cent. of metallic manganese and low in phosphorus are available, so that the manganese required for the steel manufacture need not be imported.

The Plant.—The plant is located on a tract of about 600 acres, 3 miles east of Monterey. The buildings, of steel, frame and brick, erected by the American Bridge Company, have the following dimensions:

	Feet.
Blast furnace stock house	200 x 50
Blast furnace cast house	180 x 50
Blast furnace blowing engine house	130 x 50
Blast furnace boiler house	135 x 50
Open-hearth building	204 x 100
Mill building	1,284 x 100
Mill boiler building	200 x 50
Rail-finishing building	196 x 50
Foundry	225 x 220
Machine shop	225 x 120
Power plant	156 x 56
Forge	100 x 50
Store house	60 x 60
Oil house	60 x 30
Laboratory	35 x 45

A number of brick houses and offices have been and will be built in order to keep the employers in close connection with the work, and, with the same object, a large number of tenements will be erected for the workmen.

The output of each department can be increased or diminished as conditions warrant, and the capacity per annum may be stated in tons as follows: Rails, 40,000; beams and shapes, 40,000; billets and bars, 10,000; pig iron, 30,000; castings, 8,000; total, 128,000.

The mills are planned for a much larger output than this, and could, in fact, take care of the product of 4 blast-furnaces.

Other parts of the works include a blooming mill and shear, roughing mill and heating furnaces, finishing mill, hot saw, and traveling crane.

Blast Furnace.—The furnace, built by the W. B. Pollock Company, is 80 feet high by 18 feet bosh-diameter, is equipped with four Massick & Crook hot-blast stoves, 19 feet 6 inches by 75 feet in size, and 6 Babcock & Wilcox boilers in batteries of 680 horse-power each. There are 2 pairs of vertical, compound, condensing, blowing engines built by the Wm. Tod Company, of Youngstown, O., with blowing cylinders 84 inches by 60 inches stroke, and steam cylinders 42 inches and 80 inches diameter, respectively. Arrangements are made to carry the molten metal direct to the open-hearth furnace. The estimated product is 350 tons of pig iron per day.

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* Abstract of paper read before the American Institute of Mining Engineers.

Open Hearth Furnaces.—There are 3 35-ton furnaces, and room is provided for 2 more of 50 tons capacity. They are served by a 50-ton electric traveling crane, built by the Morgan Engine Company, of Alliance, O., and an electric charging machine which charges scrap and cold pig. Molten pig can be charged direct from the blast furnace. It is intended to cast the product of the open-hearth furnace into moulds standing upright on cars. The reason for making exclusively open-hearth steel was that the wide range and variety of the Mexican market demand could be but met by that product, but room was provided on the plans for the addition of a Bessemer plant, adequate to a large output of rails, whenever such a course might become desirable, so that the addition could be built without any disarrangement of the present works.

The open-hearth ingots are carried in the moulds to the soaking pits, where they are stripped by a hydraulic ingot stripper and placed in the pits by the traveling crane. There are 3 soaking-pit furnaces, holding 12 ingots each. The lids are moved by hydraulic power. After the ingots are thoroughly heated they are taken out and placed on a tilting car, which delivers them to the table of the blooming mill.

To supply gas to the open-hearth, soaking-pit and reheating furnaces 16 10-foot Talbot producers are connected by underground flues with these furnaces.

The foundry is located parallel to the mills, in a steel frame and brick building 225 feet long. The central span is 60 feet wide, with 2 bays of 30 feet each. It contains two cupolas 72 inches in diameter and a small one for melting brass and bronze. For melting special iron for strong castings an 18-ton air furnace is provided. There are 4 core-ovens and a complete equipment of machinery for mixing sand, cleaning castings, etc., also a 30-ton and a 15-ton electric traveling crane. The capacity of the foundry is 30 tons per day. It is intended to do all classes of work, from the smallest castings to those weighing 30 tons or more.

The machine shop is located parallel to the mills, in a building of the same character and dimensions as the foundry. It is equipped with 2 Niles electric traveling cranes of 30 and 15 tons, respectively. Great care has been taken to select the best tools, which include planers, boring mill, slotter, lathes and small lathes, slotters, bolt-cutters, pipe machines and a full equipment of machine-shop appliances. With the exception of the roll lathes, each of which is driven by an independent electric motor, the tools are placed in groups, each group having its motor. The pattern-shop contains wood-working machinery, such as planes, circular and band saws, etc.

This machine shop is intended not only to build machinery for the mills, but also to do any class of work that may be demanded by mines, smelting works, railroads and manufacturing establishments.

The forge is a steel frame and brick construction, 50 by 100 feet in size, and within easy reach of the machine shop and foundry. It has a 700-pound and a 1,700-pound steam hammer, also bolt, nut and rivet machines, blower and 10 forges, with the necessary heating furnaces. Power is supplied by a 25 horse-power General Electric motor.

Power Plant.—The central power station, which is a steel-frame and brick building 56 by 150 feet in size, contains at present 2 Harrisburg tandem compound engines 17 by 27 by 10 inches in size, each directly connected to a 150 kilowatt General Electric generator. Steam is furnished by 2 250 horse-power Babcock & Wilcox boilers. The plans provide for trebling the power when circumstances shall warrant such enlargement.

Water is obtained from a large reservoir northeast of the works, and supplied from the same source as the city, and is conveyed to a well near the blowing engine house of the blast furnace. Two powerful pumps, each of 250,000 gallons daily capacity, lift the water to a stand-pipe, from which it is distributed under pressure to the blast furnace and mills. The waste water from the blast furnace is carried back to the reservoir through an open ditch, and the large surface of the reservoir allows it to cool to the desired temperature for renewed use. To furnish the necessary pressure for the different hydraulic machinery a special pressure plant has been located between the roughing and finishing mills. Two hydraulic supply pressure pumps deliver the water under a pressure of 500 pounds per square inch into an accumulator, whence it is distributed to the various hydraulic machines. The waste from these machines is conducted to a tank, from which it can be used again. The waste which cannot be used again is carried off by a sewage system.

A terminal has been located to make connection with all the railroads entering Monterey. Great care has been taken in arranging the track system to facilitate the delivery of coal, coke and ore, and the shipment of products.

A structural shop for bridges and buildings, merchant mills, wire and plate mills, are contemplated in the near future.

THE COAL-FIELDS OF ROUTT COUNTY, COLORADO.

The new railroad line between Denver and Salt Lake City, which will pass through Routt County in northwestern Colorado, has attracted a great deal of attention in that county. Its possibilities are great in all the agricultural lines, but the main resources, which will receive the greatest benefit from the construction of the new line, are without a doubt the coal deposits. Their exploitation, which is only attempted in a small way now, in order to supply the local demand, will receive a great impetus, when the higher grades of coal can reach a larger market.

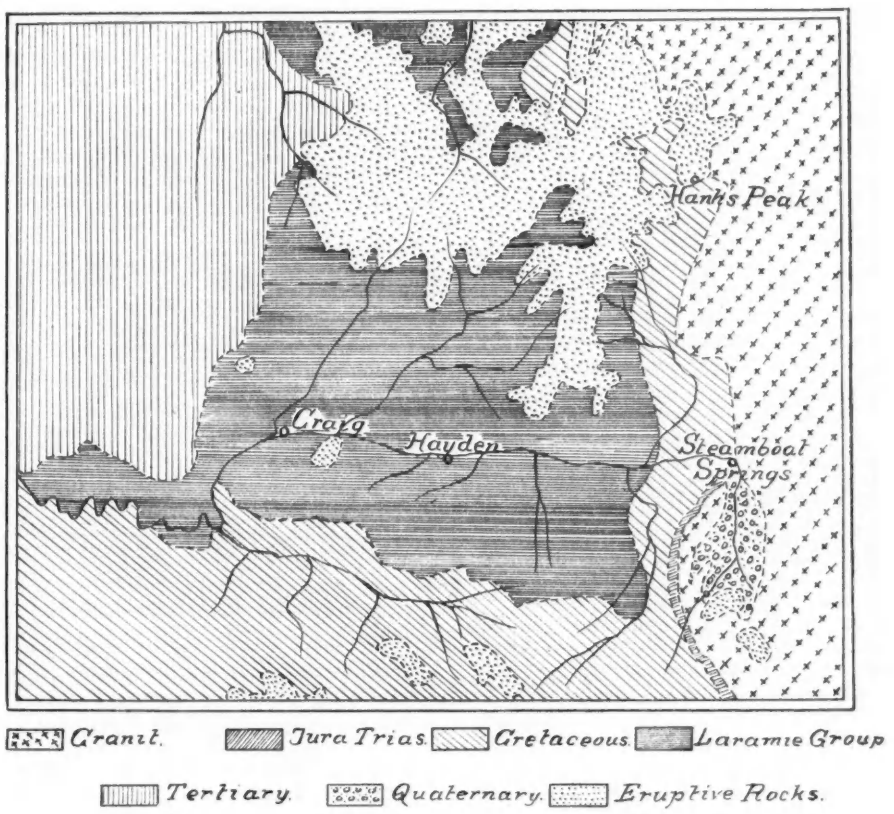
There are extensive deposits or lignitic coal, of the same quality as that exploited in the northern coal-fields of the eastern slope of the Rockies, in Lafayette, Erie, Scranton and the neighboring towns between Golden and Boulder. As the output of these fields could be easily increased, the coal-fields of the western slope, with an additional freight over the range, can be only a very poor competitor. However, the home market will be largely increased with the advent of the railroad and a demand could be created in Utah for this grade of coal. But the future of the coal-fields of Routt County is much more in the tracts of high grade coal which have been opened in several localities.

Since the deposition of the coal the country has ben subjected to strong earth pressure, which has folded up in long anticlines and synclines the coal measures with the other formations. Moreover, the measures have been in several places cut by dikes and masses of eruptive rocks, which have forced their way through. In many places, by their heat and a large outpouring of steam, they have effected the transformation of the coal from a lignite with a large percentage of volatile matter into bituminous and coking coal and even into anthracite.

The coal measures in Routt County, as everywhere else in Wyoming, Colorado and New Mexico are found in the deposits of the Laramie formation. They belong to the latest part of the Cretaceous epoch, just before the dawn of the Tertiary. It is a soft-water formation, deposited in large, shallow lagoons, with a semi-tropical vegetation. In many cases the marshes were probably more or less in communication with the open sea. The strata are an alternation of massive or thick bedded sandstones with beds of shale. The Laramie formation is from 1,200 to 1,500 feet thick, with three levels of coal measures, one at the bottom, another in the middle and the third one at the top. Each of these three coal measures has several veins and often several of workable size, of a thickness varying from 4 feet to 15 feet. Of course, veins from a few inches up occur yet more frequently. As a rule, each vein is separated from the next vein by a strong bench of sandstone a few feet thick.

On top of each one of the three coal measures is a cliff of hard sandstone from 30 to 50 feet high.

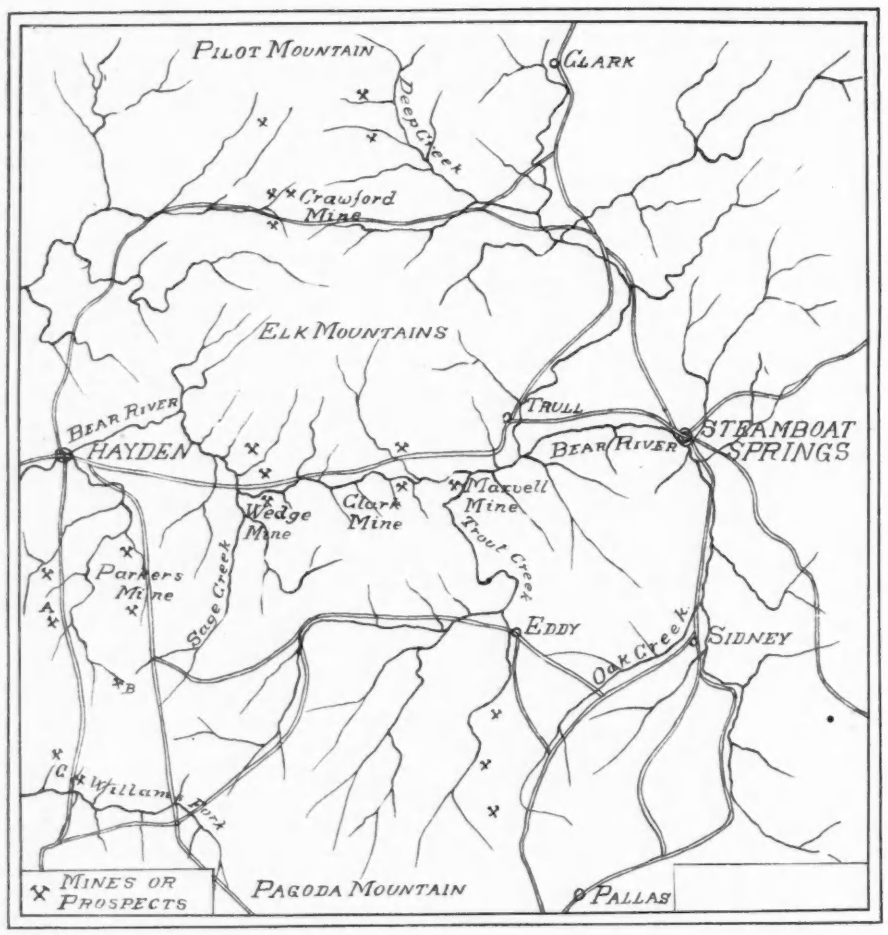
Each bench of sandstone forms continuous bluffs, easily followed in the topography, which allow us to recognize without a doubt that two outcrops of coal several miles apart belong to the same horizon of lower, middle, or upper measures. The connection between the various seams of the same series of measures is much less certain, as often two veins unite by the thinning out of the bone between them and another vein,



COAL IN ROUTT COUNTY, COLORADO.

above the preceding one, is divided in its turn into two others a little farther on the outcrop.

The area covered by the Laramie Group, as marked on the geological map of Colorado, by Hayden, is much too small. This map shows a gulch penetrating south of the Bear River, between Hayden and Steamboat Springs. The limit between the coal measures of the Laramie formation and the other Cretaceous deposits below is marked as a line directly north of Hayden. In reality the eastern limit of the coal-fields is a north-south line following a few miles to the west the county road between Steamboat Springs, terized by the presence of bituminous coal and of anthracite. The coal measures outcrop high in the mountain, in a very thickly wooded country, with numerous shrubs and high grass, so that, with the exception of a few places where the creeks have cut their way through the measures, it is nearly impossible to follow the outcrops for any distance. These fields have two outlets, one for the west side of the mountain, to the southwest towards Hayden, and another for the coal beds of the eastern slope towards Steamboat Springs, along the three forks of Deep Creek.



MAP OF ROUTT COUNTY COAL FIELDS, COLORADO.

as shown on map No. 1. That increases the coal-fields by many thousands of acres.

The coal-fields can be sub-divided into four groups, each one having special characteristics; these are:

1. The Oak Creek Coal-fields. These occupy the southeast corner of the coal deposits and have their outlet towards Yampa.

2. The Bear River Coal-fields. These are well developed in several mines along the river between Steamboat Springs and Hayden. Only the outcrops easy of access and close to the road have been developed.

3. The Williams River Mountains Coal-fields. These coal measures crop in the north-south valleys, or rather canyons, connecting Hayden and the Williams River Valley, not reaching either of these two points. They are directly south of Hayden which is their outlet.

The coal of the three fields above named is a lignitic coal, often of much better grade than that of the well developed fields of the eastern slope of the Rocky Mountains. I have seen piles of large lumps of coal, which had been exposed to the air for several years, and which had slacked only a little. Such coal could support transportation and a long storage.

4. The Pilot Mountain Coal-fields. These fields surround the summit of Mount Pilot, which is a mass of eruptive andesite, and are characterized by the presence of bituminous coal and of anthracite. The coal measures outcrop high in the mountain, in a very thickly wooded country, with numerous shrubs and high grass, so that, with the exception of a few places where the creeks have cut their way through the measures, it is nearly impossible to follow the outcrops for any distance. These fields have two outlets, one for the west side of the mountain, to the southwest towards Hayden, and another for the coal beds of the eastern slope towards Steamboat Springs, along the three forks of Deep Creek.

The three levels of the coal measures are found in the three first coal-fields, while in the anthracite fields I have been able to recognize only two of them. I think that the lower group is buried in depth in the southern part of the field, and thins out by lack of deposition towards the North.

On nearly half of the area and at the outer rim, the coal beds dip at various but small angles.

Location of the Vein.	Fixed Carbon	Volatile Matter	Moisture	Ashes
Prospect on Coal Creek, 9 f. vein	40.50	44.30	8.00	7.20
Prospect on Trout Creek, 10 f. vein	47.20	42.80	6.00	4.00
Prospect on Sage Creek, 10 f. vein	47.30	39.60	7.80	5.30
Prospect No. 2 on Sage Creek	47.30	38.50	10.10	4.10
Hutchinson prospect, 11 f. vein	47.38	41.60	5.89	5 18
Prospect W. slope Pilot Mt. 7 f. vein	48.96	38.82	4.97	7.30
Prospect on Coal Creek, 5 f. vein	49.70	38.00	2.90	9.40
Prospect on Oak Creek, 14 f. vein	51.80	41.60	4.95	1.85
Wedge Mine, 8 f. vein	52 93	39.49	4.97	2.60
Prospect on Dry Creek, 12 f. vein	56.40	33.60	3.20	6.80
Prospect on Oak Creek, 4 f. vein	58.40	32.90	4.80	3.40
Prospect W. slope Pilot Mt. 14 f. vein	62.18	13.18	1.99	22.65
Prospect on Deep Creek, 4 f. vein	70.00	11.07	4.99	13.04
Prospect W. slope Pilot Mt. 4 f. vein	78.50	9.70	5.20	8.25
Crawford Mine, 10 f. vein, upper 6 f.	85.35	2.70	1.89	10.06
Crawford Mine, 10 f. vein, lower 4 f.	77.61	7.43	5.02	12.22
Crawford Mine, 3 f. vein	87.96	5.33	2.06	4.63

The analyses vary from a lignitic coal to an anthracite.

At the center, however, the measures have been folded into two north-south anticlines. The western one is the smaller and affects only the coal measures in the eastern part of the Williams River Mountains. The fold is 1 mile wide and 4 miles long. The other is a larger and longer anticline, which begins north of the Wiliams park, in the Oak Creek Coal-fields. The fold is strongly marked, and can best be studied along the canyon of the Bear River, where it is 7 miles wide, with a rather flat and large top and two sides dipping steeply. The eastern side of the fold is the steeper and the coal veins dip there at 40° in some places. This anticline affects specially the coal-fields of the Bear River, and is felt in those of Mount Pilot, situated directly north. At Pilot Knob, the center of the fold has been cut by a large mass of eruptive andesite. This eastern fold is 7 miles wide and more than 20 long.

The coal-fields, which probably did not extend much farther at the time of their deposition than to-day, have had the edge trimmed and washed away by erosion towards the east and the south-north, the measures pass the Wyoming line and are connected with the well known and largely exploited coal-fields of that State. To the west, the coal measures are dipping under the more recent Tertiary deposits and are buried in places under many thousand feet of sediments. These Tertiary strata contain also numerous veins of lignite of workable size. But the quality of the fuel cannot compare with most of the coal of the Laramie Group.

The analyses of the coal show that the grade is very fair. The percentage of volatile matter for 16 analyses varies from 2.70 to 44.30 per cent, while the fixed carbon ranges between 4.50 and 87.98. The moisture is as low as 1.89 or as high as 10.10 per cent. The ashes give 1.85 and 22.65 per cent as extreme numbers. As will be seen, the sixteen analyses are taken from all parts of the coal-fields.

The area covered by the Oak Creek Coal-fields is included in the drainage basins of Trout Creek, down to a little north of Eddy and of Oak Creek down to a few miles west of Sidney. Towards Pagoda Mountain, the measures disappear by erosion. North, a series of summits severs this field from that of Bear River. The three measures are exposed in places along the banks of the two creeks and of their tributaries; many prospects have been opened, some verging into mines. I give the name of a mine when not only an entry, but one or several rooms have been started, and when the production reaches at least several hundreds tons of coal a year.

The Bear River Coal-fields are the continuation towards the north of the preceding ones. The coal measures, which had disappeared below the range, appear again along the canyon of the Bear River. The Maxwell Mine is on a vein of the middle group of measures, the upper group having been eroded considerably and appearing only very high up on Elk Mountains, towards the west. The vein of the Maxwell Mine is of lignitic coal, 10 feet thick, dipping 10° west. It has one room. On the other side of the river, on the opposite hill, a prospect is developed on the same vein. The Clark Mine is located at the point where the side of the anticline has straightened up and has four veins of workable size, dipping 40° east. The folding has benefited the coal, which is semi-bituminous.

Farther on towards Hayden the road cuts six veins of coal, belonging to the lower group, and opposite, on Moore's ranch and Stuart's prospect, one vein 10 feet thick has been opened. On the west side of the anticline, the Wedge Mine and

on the other side of the river the Lennox Mine have been opened in the middle group of the measures. The veins are 10 and 14 feet thick, respectively, of a good quality of domestic coal, and dip a few degrees to the west. In all of these mines the roof consists of a layer of 6 inches of loose clay or soapstone, below a strong roof of hard and thick sandstone. That layer of slate has caused several caves, and would have to be removed to permit mining with safety. It can be piled up in pillars, saving some timbering. Just above the crossing of the Steel Bridge, the road cuts the upper group of the measures, which have been very little prospected there.

In the Willams River Mountains Coal-fields the coal beds outcrop along the canyons, and the valleys cut across the mountains which gave their name to these coal-fields. The measures dip north and a little west, between 6° and 12°. Going from Hayden towards Williams Fork, one crosses successively each group from the upper to the lower one. I have marked on the map at A, B and C, three mines, with rooms, which were not known under any special name in the country. Parker's Mine is on a vein 10 feet thick, and steeply inclined, 40° west, because the Laramie group forms there the west side of the western anticlines. Towards the west, the coal measures become flat again. The coal is lignitic.

The mine A is on a vein 8 feet thick, with outcrops of other veins of workable size above and below, as in the case of Parker's Mine. The coal is of a good lignitic quality, as in all this field. The mine B is opened on a vein 9 feet thick, belonging to the middle group of the measures. It is quite out of the way and has not been worked for years. It was actively exploited 10 and 15 years ago, before veins more easy of access were discovered. The mine C and a prospect on the opposite side of the canyon are on two veins 12 and 10 feet thick, belonging to the lower group of the measures. These coal-fields are easy of access and the outcrops of the coal can be followed without difficulty for miles.

The Pilot Mountain Coal-fields, while more out of the way than any other, are the more valuable on account of the high quality of the coal. But the difficulty of access has prevented any mine from being opened, and all the developments made are only in the prospective stage. The more developed group, on the Crawford property, is, I think, on the middle group of the coal measures. Four veins have been opened by entries from 50 to 100 feet long, disclosing two veins of semi-bituminous and bituminous coal, 6 and 7 feet thick, and two veins of anthracite, 3 and 10 feet thick. On the west side of Mount Pilot, a few miles north of the Crawford property, are several other prospects, one of them is on a vein of anthracite 5 feet thick.

On the east side of the mountain, the North, Middle and South forks of Deep Creek have exposed outcrops of several veins, belonging respectively to the middle and the upper group of the coal measures. Some of the veins are of lignitic coal, and some are of bituminous coal and of anthracite. Nevertheless, no prospect is more than from 10 to 50 feet under the hill and the heavy timber prevents any good study of the outcrops.

To sum up, the coal fields of Routt County show a large area with an exceptionally great number of coal outcrops and of coal openings, some small yet and some in regular exploitation. The grade of the coal in many cases warrants belief in a bright future for these fields.

MINERAL IMPORTS AND EXPORTS OF SPAIN.—The imports of fuel into Spain for the eight months ending August 31 were 1,409,727 tons of coal and 109,949 tons of coke. Imports of metals included 1,821 tons pig iron, 3,010 tons wrought iron and 6,919 tons steel. Exports of minerals are reported by the *Revista Minera* as below, in metric tons:

	1901.	1902.	Changes.
Iron ore	4,495,624	4,956,639	I. 461,015
Copper ore	709,449	646,682	D. 62,767
Zinc ore	51,250	59,168	I. 7,918
Lead ore	1,993	2,097	I. 104
Pyrites	288,859	312,600	I. 23,741
Salt	219,133	183,713	D. 35,420

Exports of metals were 30,433 tons of pig iron, against 14,387 tons in 1901; 17,209 tons of copper, against 18,850 tons; 1,201 tons zinc, against 1,518 tons; 100,736 tons lead, against 96,233 tons last year.

THE MECHERNICH SYSTEM OF MAGNETIC CONCENTRATION.

In this system, as described by Hassreidter in the *Journal* of the Society of Chemical Industry, September 30, 1902, the ore is delivered by an adjustable chute between two magnetic poles, the upper one of which (the north pole) is rotated. As the ore arrives in the magnetic field the permeable particles are attracted by the north pole and are carried around by it into zones of progressively diminishing intensity until the centrifugal force imparted to the particles overcomes the magnetic attraction and they fall into collecting chutes, being classified according to their magnetic properties. The non-magnetic material falls directly into a chute close against the lower pole. This arrangement is claimed to have the advantages of dispensing with belt carriers, which weaken the magnetic field, and also of permitting the use of small magnetic fields and very narrow air spaces, thus minimizing the loss of energy and making it possible to attract feebly magnetic particles by a very weak current. The rotating pole being the only moving part of the machine, wear and tear is very small. In separating blende and siderite from the Upper Harz, the grains being of 0.5 millimeter size, 98.7 per cent of the zinc has been recovered. With dolomitic Silesian blende of 2 to 3 millimeter size, the recovery was 91.8 per cent, which was increased to 93.5 per cent by reducing the grains to 2 millimeters. In treating ore from Broken Hill a yield of 81 per cent of the lead and 69 per cent of the zinc was obtained. A plant of this type installed at Broken Hill for the treatment of middlings assaying 28 per cent zinc, 10 per cent lead and 9 ounces silver per ton furnishes a product with 44 to 45 per cent zinc and 4.5 per cent lead.

THE NORTH AMERICAN LEAD COMPANY'S MILL.

The new mill of the North American Lead Company at Fredericktown, Mo., embodies some novelties in the ore dressing practice of Southeastern Missouri. Its nominal capacity is 125 tons per day. It was designed by Mr. R. D. O. Johnson, of St. Louis, who has had an extensive experience in the treatment of the lead ores of this district; he was the designer and superintendent of the great mill of the St. Louis Smelting and Refining Company at Flat River. The following description of the North American Lead Company's mill is condensed from the *Lead and Zinc News*, of October 6, 1902. The most striking novelty is the introduction of dry-crushing the ore:

The ore is first dumped on a mechanical grizzly, which delivers the oversize to a No. 5 Austin crusher. The product of the crusher is culled on an annular picking table, the rich mineral and the barren rock being picked out thereon. The ore scraped off the table goes to a trommel with 1.25-inch holes. The undersize is joined to that which passed through the grizzly. The oversize is delivered to two No. 3 Austin crushers. The ore, of which all is now broken to 1.25-inch size, is fed mechanically to the boot of an elevator, which raises it to trommels with 6-millimeter holes, situated above a storage bin. The ore finer than 6 millimeters accumulates in the storage bin; that which is coarser goes to two sets of rolls, the product of which returns to the 6-millimeter trommels. These operations are performed in the shaft house.

The ore crushed to 6-millimeter size is fed mechanically from the storage bin to an elevator, which raises it to the top of the concentrating mill, where it is caused to pass first through a mechanical sampler. (This is an innovation which is commendable and worthy of imitation. It enables the efficiency of the mill to be measured in the only reliable way, by comparison between the value which goes in and that which is taken out. This will surely lead to improvements in the milling practice and economies that might otherwise be overlooked. The article from which we quote does not state what arrangements are provided for weighing the ore, but doubtless that essential detail is attended to). From the sampler the ore goes to a shaking screen, which divides it into two sizes, 6 to 2.5 millimeters, and finer than 2.5 millimeters. These products fall into small bins, whence it is fed mechanically to two mixing boxes, wherein the necessary water for the milling process is added. The pulp is agitated by a blast of air to insure thorough wetting of the ore. A small stream of clear water introduced under the box in which the coarser product is mixed removes any adhering fine material and delivers it into the other box.

The ore from the first box passes to a hydraulic classifier, which delivers its products to 8 three-compartment jigs. The ore from the second box, after hydraulic classification, goes to Gates stratifying tables. These tables, like the jigs, make three products—heads, middlings and tails. The middlings and the rich tails are recrushed and treated for further recovery of their values by washing on tables and in spitzkästen in more or less the usual manner.

IRON AND STEEL EXPORTS OF GREAT BRITAIN.—Exports of iron and steel, and their manufactures, from Great Britain for the nine months ending September 30, were valued by the Board of Trade returns as below:

	1901	1902.	Changes.
Iron and steel	£19,003,025	£21,314,967	I. £2,311,942
Machinery	13,425,301	13,929,373	I. 504,072
New ships	6,316,029	4,735,956	D. 1,580,073
Totals	£38,744,355	£39,980,296	I. £1,235,941

The large increase in iron and steel was partly offset by the decline in the shipbuilding trade this year.

Exports of pig iron and of steel billets and blooms from Great Britain to the United States for the nine months ending September 30 were as follows, in long tons:

	1901.	1902	Changes.
Pig iron	33,365	281,144	I. 247,779
Steel billets, etc.	9,092	37,924	I. 28,832

The exports of pig iron this year were more than eight times those reported in 1901, and those of steel billets about four times.

ANALYSIS OF RED LEAD.—Minium, or red lead, is a mixture of PbO_2, $2\,PbO(Pb_3O_4)$ with unchanged PbO, and as impurities $PbSO_4$, SiO_2 and metallic lead. Its value depends on its tenor of PbO_2. E. Szterkhers (vide *Annals de Chimie Analytique applique*, VII, 214 to 217; *Chemiker Centr.*, 1902, II, iv, 305; *Journal Society of Chemical Industry*, September 15, 1902, XXI, xvii, 1156) determines this by heating 5 grains of the sample in the water bath with 100 c.c. of water and 5.7 c.c of pure nitric acid. After cooling to 50° C. an excess of a standardized solution of sodium nitrite is added gradually, and the excess is then titrated back with potassium permanganate. The reaction with the sodium nitrite is expressed as follows:

$$PbO_2 + 2\,HNO_3 + NaNO_2 = Pb(NO_3)_2 + NaNO_3 + H_2O.$$

A 1 per cent solution of sodium nitrite and an 0.8 per cent solution of permanganate are recommended.

PLACER MINING IN JOSEPHINE COUNTY, OREGON.

By A. B. COUSINS.

Josephine County in Oregon is the pioneer mining district of the State, gold having been discovered in the spring of 1851, or very soon after the commencement of mining in California. Within a very short time thousands of prospectors visited the many mountain streams in the region, and more especially Applegate, Illinois, Josephine and Galice rivers. While there is no record, it is estimated that about $9,000,000 in coarse gold and nuggets were taken from those streams and their tributaries from the years 1851 to 1855. This result was obtained with the primitive methods of cradling and similar operations which were in use in those days.

While gold mining since that time has been carried on to some extent, placer mining always has been the principal form, owing to its abundance of the gold-bearing gravel deposits. It is claimed that valuable quartz ledges exist and a number of them have been located, but they have not been worked, because of the greater ease with which the placer deposits can be exploited.

The region covered by Josephine County possesses peculiar facilities for mining on the hydraulic system. There are a large number of streams, generally easily accessible, and the heavy rainfall prevailing all through western Oregon, furnishes abundant water, while the mountainous nature of the district and the volume of most of the streams furnishes plenty of power for the giants. Those who are familiar with the placer deposits of the county claim that in them are included the largest and richest gold-bearing gravel deposits to be found in Oregon. As in some parts of California, the richest deposits are found in the beds or ancient channels which exist along the present rivers and creeks. At the present time there are about 150 hydraulic operations in existence in the county, which is probably a greater number than can be found in any district of equal extent in the United States.

The principal mining districts of the county are those of Waldo, Althouse, Galice and Grave, which occupy respectively the four corners of the county. There are a number of minor districts and placer mining is carried on in every part of the county. There never has been since the early days any boom in mining in this region. Although it is not newly discovered, nor inaccessible, its mines have not of recent years received much attention and the operators have had a considerable struggle to establish the reputation of the district. The Oregon branch of the Southern Pacific Railroad passes through the county and many of the placer mines are located not far from the railroad. A branch road running down Rogue River to the coast would be of great advantage to the region and its construction has been under discussion for some time.

A further advantage is found in the climatic conditions of southern Oregon. The water supply is sufficient to enable miners to carry on operations nearly all through the summer. Even in the two dryest months there is always enough water to clean up and get in readiness for the fall work. The winters are not severe, and there is very little snow to interfere with work. Supplies can be obtained at any time.

The valley of the Illinois River in the southern part of the county contains good value in gold in many places, and the region is becoming a network of ditches and flumes. A number of operators are also working on a small scale on Galice Creek, on Waldo, Josephine, Grave, Wilson and a number of other streams. Among the prominent operations are the Old Channel, where work is carried on a large scale and with the latest appliances. Another company which operates on a considerable scale is the St. Helens & Galice Mining Company, which owns several hundred acres on Galice Creek. On this stream there are no farming interests to interfere with mining operations or to object to the dumping of tailings. Along Rogue River the stream is wing-dammed every spring and a large number of miners are at work. The small operations which have been carried on for a number of years are now being exploited on a larger scale and regular hydraulic work is taking the place of the old ground sluicing This has led to the construction of a number of large ditches. The gold found in this district is generally coarse and nuggets reaching in value from $1 to $40 or $50 are not uncommon. As a general rule, no gold-saving devices other than ordinary pole or block riffles in the sluices are required to save the metal. The gold is generally of a high degree of fineness, and is rated at the mint at from $18 to $19 an ounce.

The point of difficulty at the present time, and one which has in the past interfered considerably with mining operations, is the different control of the mining ground and the water. On several of the creeks where good values are found the water is controlled by the ranchers living near the mouths of the streams and is used by them for irrigation purposes. These farmers have generally objected to the use of the water by the miners on theh upper part of the streams, and have also opposed the dumping of tailings in all the adjoining creeks. A settlement of these difficulties is gradually being worked out, and it will probably end in the acquirement of the water rights of a number of the streams by the large mining companies.

The accompanying illustrations are reproductions of photographs taken of two of the more important hydraulic operations in the county.

A HYDRAULIC MINE IN SOUTHERN OREGON.

THE FUTURE OF MINING IN ONTARIO.

In the recently issued report of the Bureau of Mines of Ontaria, Mr. T. W. Gibson, Chief of the Bureau, gives an interesting statement of the work to be done in the future, which we reproduce below:

The field of the Bureau's operations is very far from being exhausted; on the contrary, opportunities to extend its work increase and multiply with the general development of the Province. The opening up of new or northern Ontario is a question deeply occupying the public mind, and the settling upon the waste lands of the Crown of a hardy and productive population is a prime necessity if Ontario is to keep in step with the progress of the continent or maintain her preeminence among the confederated Provinces of the Dominion. That there is great mineral wealth in the northern and western portions of newer Ontario can no longer be doubted, and upon its utilization in the near future must, to some extent, depend the speedy development of those districts, especially where the land is not well adapted for agriculture.

But it is not in newer Ontario only that there is scope for the best energies of the Bureau. The palæozoic rocks of the southwestern peninsula differ greatly from the Huronian formations of the north and northwest portions of the Province in the character of the economic minerals which they contain; but the petroleum and gas wells, the salt and gypsum beds, the limestone and sandstone quarries afforded by the Silurian and Devonian formations of settled Ontario, as well as the beds of marl and clay, the banks of sand and gravel, and the peat bogs overlying them, are not less important and useful in their way than are the iron, copper, nickel, gold and silver found in the older rocks of the east, north and west. More or less data with regard to the non-metallic deposits of the palæozoic formations exists in the *Reports* of the Geological Survey, of the Bureau itself and elsewhere, but it is fragmentary and scattered through many volumes, and hence is difficult of access to the ordinary inquirer. There is need for an overhauling of the information already on record as well as of fresh investigations in the field, the amount of original work done since the days of Logan, Murray and Hunt, now about 40 years ago, having been but small.

Take, for example, the clay deposits of older Ontario, leaving out of sight for the moment altogether the clays of newer Ontario, which are important, but little known. As the raw material for common, pressed and paving brick, for drain tiles and sewer pipe, for terra cotta and pottery, as an ingredient in the manufacture of Portland cement, and for many other uses, clay is an article of prime utility. In Ontario it is abundant in a variety of forms and in several geological formations. There are the Saugeen and Erie clays described by Logan, as well as countless other areas and pockets in the drift of great aggregate extent,

and in addition there are the indurated shales of the Hudson River, Medina and other formations, some of which, as in the neighborhood of Toronto, at Milton, and elsewhere, are now being used for making pressed brick and terra cotta of a high grade of excellence. These shale deposits are of great thickness, and constitute reserves which can be drawn upon for ages to come in the manufacture of structural materials. But notwithstanding the undoubtedly rich resources which the Province possesses in the matter of clay, there is a lack of systematic or classified information bearing upon the origin of the deposits, their composition or their utilization for economic purposes. The collection of data of this kind has been made a feature by the authorities of several of the States of the Union, to the decided advantage of industries using clay as raw material.

Similarly, there is need for particular information respecting the limestones of the Province. In limestone, as in clay, Ontario is singularly rich, there being few districts of any extent in the older portions of the Province where outcrops of limestone are not found. It is everywhere burned for lime, and where of suitable quality is extensively quarried for building and construction purposes or in the manufacture of rock cement, but new uses for limestone are being found, as for instance, in making calcium carbide, in the refining of beet sugar, in the manufacture of sulphite wood pulp, and in other ways. These various uses require limestone of appropriate composition, certain constituents being necessary in some cases and detrimental in others. To locate and describe the available deposits of limestone in Ontario, to determine the purposes for which they are severally adapted, and to ascertain something of their commercial value as the bases of actual industries, is work which will involve much geological and chemical investigation, yet it is work which, if properly performed, will be of material benefit in the industrial development of the Province.

Again, the cement industry is one which is expanding with more than ordinary rapidity. Cement is being used for a variety of purposes to which not long ago no one thought of applying it, and in the construction of street foundations, granolithic pavements, etc., there is a large and increasing demand. Notwithstanding the abundance of the raw materials from which Portland cement is made, and the increased production in Ontario during the past two or three years, much foreign cement is being imported into the country, particularly from the United States, and there seems no good reason why the great bulk of the product consumed in Ontario should not be of home manufacture. It would probably conduce to this end if a careful examination of the marl beds of the Province were made, typical deposits analyzed and all useful information brought together as to processes of manufacture, uses for product, etc.

It is unnecessary to further recapitulate the advantages which a careful and intelligent examination of the mineral resources of older Ontario might be expected to yield to the public interest. The need for such work is great, and it is only because the resources at the Bureau's command in men and money have been limited, and because the necessity of exploring the iron, copper, nickel and gold regions of the Province seemed to be still more urgent, that more of it has not been done. To effectually bring out such an examination will require time, money and skill, but in the opinion of the undersigned the importance of the objects aimed at will amply justify any reasonable outlay.

Many inquiries were received at the Bureau during the past year respecting minerals of various kinds, both from parties desirous of purchasing supplies of such minerals or lands containing them, and from owners of deposits or lands wishing to effect sales. These inquiries covered a long list. As might be expected from the activity in the iron and steel trade, iron ore lands have been specially in demand, and numerous applications were received, especially from the United States, for particulars as to developed ore and matte, and nickel and copper lands have or partially developed iron ore deposits. Nickel also been inquired for by many correspondents; gold and silver locations to a smaller extent while deposits of iron and copper pyrites, mica, feldspar, baryta, talc, asbestos, gypsum, zinc ore, marl (for cement), graphite, corundum, limestone, granite lepidolite, molybedenite, platinum, manganese and peat have been the subject of correspondence with a varying number of persons. Wherever possible the Bureau has put purchaser and seller in touch with each other, leaving them to make their own bargain.

MINE TIMBERING BY THE SQUARE-SET SYSTEM AT ROSSLAND, B. C.*

By BERNARD MACDONALD.

Since its first introduction on the Comstock Lode by Mr. Philip Deidesheimer, the square-set system of mine timbering has undergone many modifications in detail, chiefly the result of variations in local conditions.

In the mines in the Rossland District in British Columbia the ore deposits have widths ranging up to 100 feet or more, and lengths of several hundred feet along the veins. The veins are sheer zone fissures, the vein-filling consisting of shattered country rock, which is now found, replaced, and cemented to various degrees of completeness by auriferous pyrrhotite and chalcopyrite.

The ore and the enclosing rock may be designated as extremely hard, and the veins dip at angles of about 70°. These conditions facilitate and simplify timbering, without, however, doing away with its necessity.

In stoping out these deposits, the work is begun at the level drives or drifts run in the vein, and continued upwards in steps or stopes. The first work in opening up an ore shoot or deposit preparatory to extraction, consists of running drives through it from the level stations at the shaft, which are generally cut at distances of from 100 to 200 feet in depth below each other. Such drives may happen to be run along either wall of the vein, or, through the vein at any point or distance (usually varying) from either wall.

These drives are considered as random bores, made longitudinally through the vein to determine, in a general way, its course or strike, and the behavior and characteristics of the ore shoot. They serve, besides, as preliminary thoroughfares for the traffic, drainage and ventilation necessary for the work preparatory to stoping, to be hereafter described.

As generally run, the drives have widths of about 6 feet, and heights of about 8 feet, and require no timbering, owing to their comparatively small size and the hardness of the vein rock.

When it is decided to begin stoping on any new level, the first work done is to excavate the ore along the drives from wall to wall of the vein, making the excavation of sufficient height to receive the "sill floor" set of timbers, as the first series of square sets on the level is called, and to leave a space of two or three feet over the set. This space serves to provide room for blocking and wedging the timbers to place, and to receive a layer of old timbers, or broken ore, to act as a cushion in preventing the possible breaking of the timbers by the masses of rock that must be blasted down on them, as the work of stoping out the ore above proceeds.

The sill floor is a framework, made of 10 by 10-inch sawn timbers, laid down on the working level in the ore body, which serves as the sills or foundation timbers on which the square sets are to be erected. It is, therefore, the first, as well as the most important part of the square set system of timbering.

Fig. 1 shows the sill floor as laid down and ready to receive the "sill floor set" of timbers. The members of the sill floor consist of three pieces—the stringer, or long sill; the spreader, or short sill; and the butt spreader, or brace. These members, when repeatedly laid in duplicate, will make up a sill floor to any extent required by the size of the deposit.

The dimensions and details of the framing of these members are also shown on the plate.

The long sill measures 15 feet over all, and is framed from a 16-foot timber, which allows six inches to be cut from either end to square the piece and remove sun-cracks.

The short sill, as framed, measures 5 feet 4 inches in length, over all, three of which may be cut from a 16-foot timber, if it overmeasures a few inches, as it generally does, and the ends are sound.

The butt sill or brace is framed of varying lengths to suit the existing space, which generally varies, owing to local bulgings or contractions of the vein. It is framed on one end exactly like the short sill, while the other is cut square or beveled to fit or butt against the wall rock, from which it is wedged tightly to place against the long sills.

A description of the method of framing the sill floor set of timbers is not needed, as the method will be fully comprehended by a glance at the figures on the plate.

In laying the sill floor, the long sills are set ends abutting flush against each other, and as nearly as possible parallel with the general strike of the vein, ignoring any local bulging of the walls.

The first sill is laid close and approximately parallel to the foot wall, in which position it is leveled or held by blocking or butt braces; the other long sills are laid paralelling this one at proper distances apart, that is, 5 feet 4 inches between centers. The cross sills fit on top of these, lying level with them, the ends being halved in framing the rest into similar halvings in the long sills, and to abutt flush against each other and extend endwise from wall to wall of the vein.

When the long sills reach as near the hanging wall of the vein as desirable, they are braced from it by the butt spreaders or by blocking, wedged tightly to bring all the members into proper position. The philosophy of this design of the sill floor is as follows:

The long sill is made 15 feet in length, so as to better sustain the superstructure of square sets erected on it when the ore upon which it rests comes to be stoped away. For instance, when the ore is being blasted from under the sill floor by the work of stoping coming from the level below, and the blasting tears away a portion of the ore upon which the sill floor rests, making an opening as it generally does, of, say, 8 by 8 feet, the long sills would overreach such opening, and one or both ends would rest on the solid rock beyond. Nor would the short sills drop away through such opening, owing to the fact that they rest on the top of the long sills, as previously described and shown on the plate.

Through the opening thus made in the ore, the portion of the sill floor exposed would be supported by posts set on the timber sets in the stope below. Thus the long sill operates to allow the work of stoping out the ore upon which the sill floor rests to be safely conducted if such portions of the sill floor as become exposed as the work proceeds are properly supported by posts from the timber sets underneath.

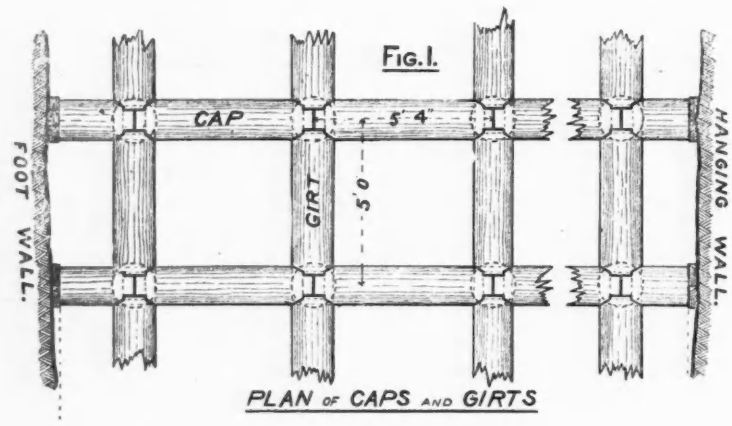
The first tier of square sets erected on the sill floor is known as the "sill floor sets." The assemblage of the framed timbers into square sets then proceeds upwards, by floors, set over set, vertically, *pari passu* as the work of stoping exhausts the vein. The timber structure over any level is referred to in subdivisions as the "sill floor

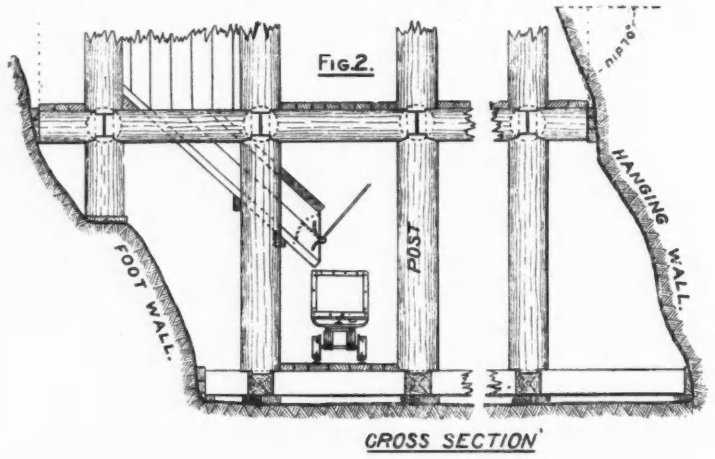
* Paper read before the Canadian Mining Institute, Nelson meeting, September, 1902.

sets," "first floor sets," "second floor sets," and so on until it reaches the next level above and catches up and supports the sill floor on that level.

This method of reference to the timbering as it advances, carries with it the data for a general calculation of the portion of the vein exhausted over a level as each set of timbers in place indicates that 9 feet vertically and 5.3 feet horizontally of the vein is exxhausted, 9 feet being the bare height and 5.3 feet the width of space required for a set of timbers. And each square set in place indicates that 24 tons of vein matter have been extracted.

Aside from the sill floor, all the timbers employed in the square set system, except the planks for floorings and chutes, are framed from round logs. These logs are preferably of red fir, this

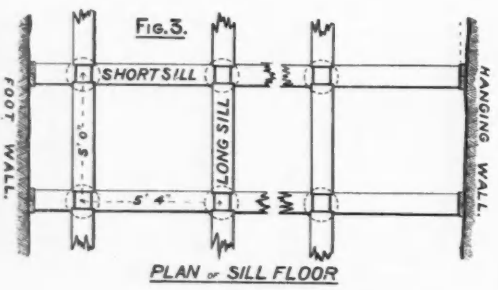




being the strongest native timber, but pine, spruce and tamarac may be used. When cut in the woods, the logs are peeled and allowed to season for a period of from six to twelve months, during which time they lose about one-third of their green weight, which is a very important advantage in subsequent handling. In diameter, they range from 12 to 20 inches, but generally average about 16 inches, and are sawn in lengths of 16 feet 6 inches.

The logs may be framed by hand or with machine saws into the various members of the square set, as follows: Posts, caps, girts or braces, and butt caps. Like the members of the sill floor, these members may be duplicated to any extent required by the size of the excavation to be timbered.

The posts as framed are 8 feet 2 inches over all; the caps are 5 feet 4 inches, and the girts or



braces are 5 feet; the butt caps, like the butt spreaders on the sill floor, are cut in varying lengths to suit such spaces as may exist.

The details of framing the logs into members of the square set are plainly shown in the illustration, and need no further description. The philosophy of this method of framing the timbers is that the cap pieces of the various sets form continuous stringers of timbers running horizontally from wall to wall of the vein, no matter what this distance may be. Such stringers offer the end grain or greatest strength of the timbers to the walls, from which the greatest strains coming from the undercut ore deposit and the broken ore lying on the floors, but strains coming from any direction are distributed over all the members of the set.

The system possesses, to a considerable degree, the qualities of a truss, and makes it possible to extract all the ore of any deposit and effectually secure the enclosing walls from caving in. When the framework comprising the sets is erected, a floor, consisting of 3-inch plank, is spiked down on the caps of each floor set. These are the working floors on which the miners operate the machine drills, in the method shown in Fig. 5. When the ore is dislodged from the vein by blasting, it falls on these floors, where the waste or second class ore may be sorted out from the shipping ore. The shipping ore is shoveled into chutes which are built of 4-inch plank spiked to the timber framework and carried upwards with the square sets, as shown in the plate. The second class ore or waste sorted out, may be stored temporarily or permanently in the framework of the timbering from whence it may be drawn off at any time through chutes, should removal elsewhere be desired.

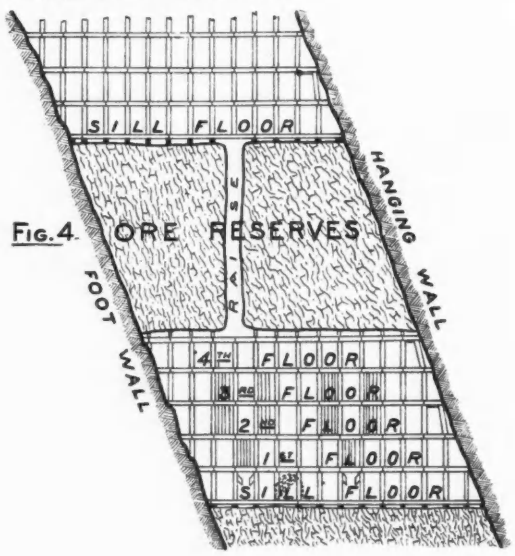
Figs. 4 and 5 are ideal cross and longitudinal sections illustrating the method of timbering and the work of stoping as it is carried on between the levels. Fig. 4 is a cross-section through the line A-B on Fig. 5, which in turn represents the longitudinal section through the line C-D on Fig. 4. On Fig. 4, the original position of the level drive in the vein is assumed as shown at the point X. This drive, as already stated, furnishes the point from which the excavation of the vein matter for the sill floor is commenced.

The step method of excavating the ore is shown in Fig. 5, where stoping is proceeding in double-headed steps, each step excavating the ore from wall to wall and having a vertical height of 9 feet in the clear, which allows of the erection of one floor of timber sets, which in turn provides the scaffolding from which the miners may attack the ore above.

In stoping out the ore on any level, the ordinary method is to keep the sill floor at least 30 feet in advance of the first floor, and it about 30 feet in advance of the second, and so on, as is shown in Fig. 5. One machine drill, or generally two, in case the vein is wide, are assigned to work the two opposite headings of any floor, going in opposite directions, working on each heading alternately. When one face is drilled and blasted, the machine-drills are changed to the opposite face, and the shovelers pass the broken rock into the chutes, or sort it, if sorting is required. When the ore broken is thus removed from the face the timber gang erects another unit of the square sets there, and the stope is again in readiness for the machine drills, which have by this time finished drilling on the opposite face.

Generally the step method of stoping proceeds in opposite directions from a raise, run through the ore body between the levels, as shown in Fig. 4. The framed timbers are delivered in the stope by dropping them down through this raise or hoisting them from the level. Sometimes the framed ends of the timbers are injured by droping them through the raise, but, as a rule, no material injury is done to them, while the time gained by this method is a very important factor

IDEAL CROSS SECTION



in cheapening the cost of timbering, compared with hoisting piece by piece from the sill floors underneath.

After the sill floor is laid and the framework started, a square set, which is made up of one post, one cap and the brace, consumes 18 feet 6 inches running measurement of logs.

The logs peeled and seasoned cut measuring 16 feet 6 inches cost $1.20 each delivered f. o. b. the cars at the works, or about 8 cents per running foot. Therefore, the 18 feet 6 inches required for the set would cost $1.48, or say $1.50 unloaded in the framing shed, provided the logs are not cut

to waste in framing, which may be avoided with a little care and foresight.

The cost of framing the pieces comprising the set would be about $0.553, when framed by hand labor, carpenters being paid $3.50 per day of nine hours.

Cost Data per Square Set, Hand Framed.

Material.—A log, measuring 16 ft. 6 in., costing $1.20, cuts into two posts, or three caps, or three braces; therefore:

Material in one post costs	$0.65.0	
Material in one cap costs	0.43.0	
Material in one brace costs	0.43.0	
Total cost of material in one set is say		$1.50.0
Labor.—One carpenter (wages $3.50) frames per day:		
About 21 posts, costing each	$0.16.7	
About 21 braces, costing each	0.16.7	
About 16 caps, costing each	0.21.9	
Total cost for framing		$0.55.3
Total cost of labor and material in set		$2.05.3

The details of cost of the individual members of the set framed on the surface, ready to go into the mine are therefore as follows:

1 post costs, for...	Material ... $0.65.0 / Labor 0.16.7	$0.81.7	
1 cap costs, for....	Material ... 0.43.0 / Labor 0.21.9	$0.64.9	
1 brace costs, for..	Material ... 0.42.0 / Labor 0.16.7	0.58.7	
Making the total cost			$2.05.3

The costs next attaching to the square set, or unit, of this method of timbering are:

Lowering into the mine	approximately	$0.10
Delivering to place required	"	0.10
Labor in erecting	"	1.50
Incidental material, such as blocks, wedges, tools, nails	"	0.10
Cost of sill floor averaged over 11 sets between levels 100 ft. apart	"	1.15
Total		$1.95

These costs last above given may vary greatly, being increased or decreased with the completeness of the facilities for handling the framed timbers, the cost of the several items as stated may vary accordingly from time to time, but the total will be about the average cost, which will closely approximate that of carefully supervised operations. Therefore, from the foregoing it will be seen that the cost of the square set placed in the mine will come down, as follows:

Total Cost of Labor and Material, as above	$2.05.3
Labor and material when set is in place as above	1.95.0
Total cost say	$4.00.0

When framed by machine saws, the cost of framing a square set does not exceed 30 cents, including the cost of power, as against 55 cents by hand, a difference of 25 cents per set. Therefore, if the framing is done by machinery, the cost of a set in place would be $3.75 as against $4, as shown above when the framing is done by hand work.

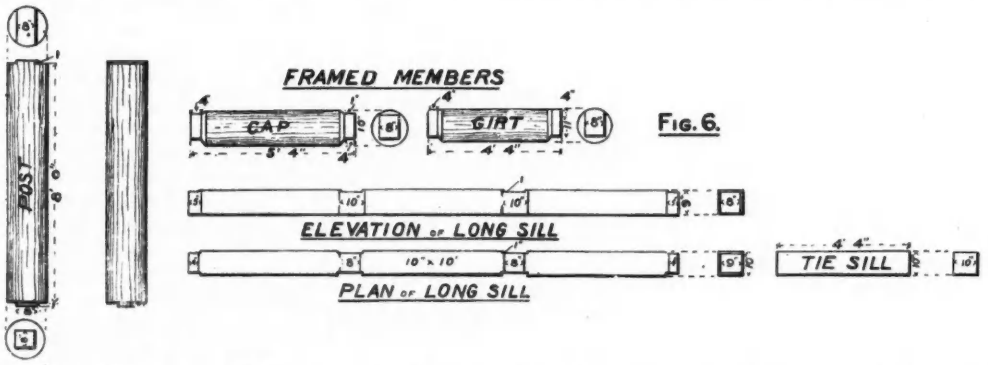


FIG. 6.

The per tonnage cost for timbering by this method works out as follows: The average space to be excavated for each set square is 5.3 feet wide by 5 feet long, by 9 feet in height, or 240 cubic feet. The Rossland ores, being heavily impregnated with iron and copper pyrites, yield a ton of 2,000 pounds for each 10 cubic feet of ore in place; therefore, from the 240 cubic feet of vein required to be excavated for a set of timbers, the yield will be 24 tons. If the timbers were framed by hand the cost of timbering, so far as described, would be about $0.17 per ton; if by machinery, $0.15.6, a difference of $0.01.4 per ton in favor of the machine-framed sets.

In addition to the costs above tabulated, there still remain the costs of the chutes, floors, ladders and railings, necessary for the convenience and safety of the miners and the passage of ore and supplies. These require, on an average, about 100 feet of lumber, board measure, per square set, which, at $11 per 1,000 feet, would for the lumber $1.10, and for placing it, say $0.10, or a total of $1.20 to each square set, which would then cost, in the case of hand framing, $5.20, or a total cost of $0.216 per ton of crude ore; and in the case of machine-framing, $4.95, or a total cost of $0.206 per ton of crude ore.

The cost of timbering, per ton of ore shipped, would be greater than the figures given above in proportion to the quantity of waste or second-class ore that would be sorted out from the crude ore extracted.

In the Rossland mines about 20 per cent of the ore mined is sorted out, and goes to the second-class ore dump to await profitable treatment, expected to come in the future. Deducting 20 per cent of the 24 tons of crude ore in a square set, there would remain 19.20 tons as the shipping ore, against which the total costs of the square set as above, $5.20 or $4.95, as the case might be, would have to be charged. This would raise the per tonnage costs on the ore shipped to about $0.27 and $0.26 respectively.

Where there is a reasonable expectation that the second-class ore will eventually pay a profit after suitable treatment, it would be only fair to charge a pro-rated cost of the timbering to it, and the cost would then remain $0.206 and $0.216 per ton, as above.

In cases where, on account of bad ground, angle bracing, bulk-heading, or cribbing and filling would be required, the per tonnage cost would be still further increased, but to a comparatively small extent.

The limit of the capacity of the square set system as already described without any reinforcing devices to withstand the pressure that may be exerted on it by the enclosing walls of an ore body when that ore body is extracted, may be reached.

This limit depends on the nature of the walls enclosing the deposit, and the extent of the excavation. If the wall rocks are solid and do not swell on exposure to the air and dip at a high angle, the ore body may be extracted between levels, say, 100 feet apart and for a length of 200 or 300 feet along the vein, and the pressure likely to be exerted by the walls will be sustained by the skeleton square sets without reinforcement of any kind.

If, however, the vein dips at a low angle, and the wall rocks are decomposed, or of a talcose or serpentine character and disposed to swell, the pressure that might be exerted on the timbers, when even a comparatively small excavation of the ore body has been made, may cause them to

IDEAL LONGITUDINAL SECTION

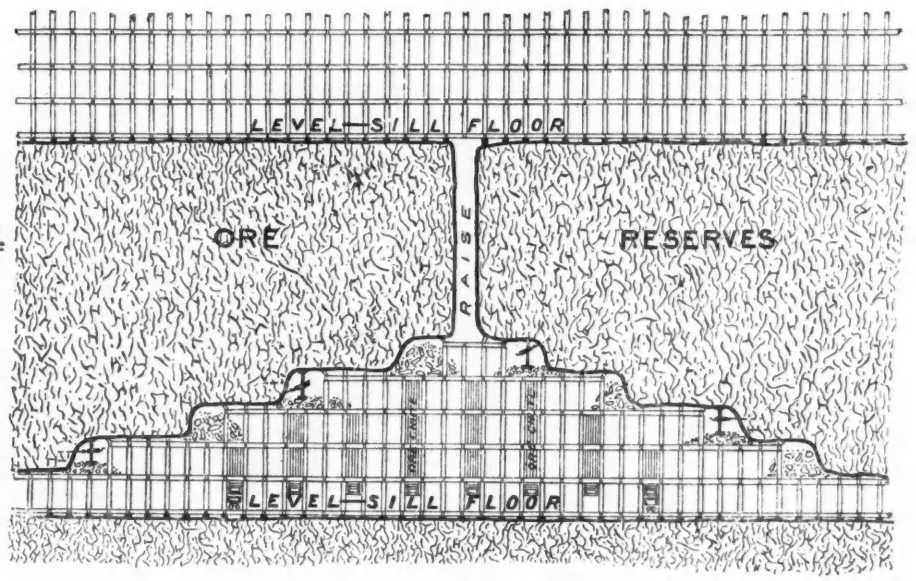


FIG. 5.

crush, "jack knife," or collapse, allowing the wall rocks to cave in and close up the stope. When the members of the square set become squeezed out of the truly right-angled position which they should occupy, their capacity to resist wall pressure or strains from any direction is practically *nil*.

When, owing to wall pressure or imperfect erection of the sets, "jack knifing" of the square sets results, the cave-in, which sooner or later may follow, with disastrous consequences, can be prevented by either bulk-heading, cribbing, or filling the skeleton framework of the timbers with rock.

The cost of the foregoing methods of reinforcement, which are the only practical ones that can be successfully used in bad ground, cannot be given with any general degree of accuracy, as that is so much affected by the local conditions in each case.

A general idea of what the cost is likely to be may be gleaned from the description following:

Angle-bracing.—If, after the square sets are properly erected in place, the members manifest an inclination to swing out of the right-angled positions they originally occupied to each other, this tendency may be arrested and prevented by a system of angle-bracing. This consists of placing diagonal braces made of round or square timber on the sill floor and against the foot of the posts, and leaning the heads so they will fit snugly against the top of the posts underneath the caps or girts, as the case may be, of the next adjacent set. The head of this diagonal brace should lean in the direction from which the pressure comes. This method is illustrated in Fig. 8.

Cribbing.—When the square sets manifest a stronger tendency to swing than in the case referred to, the collapse threatened may be pre-

vented by crib-work. This consists of crossing alternate layers of round or square timbers of any convenient size between the posts of the sets until the space between the sill and cup is filled, as shown in Fig. 9. This crib-work may extend from wall to wall through two or more rows of sets if required, and the spaces beween the sets thus cribbed may be filled with waste rock, but this is called "Filling," and will be referred to under that heading below.

Bulkheading.—This method of reinforcement consists of placing timbers closely together in much the same way as the crib-work above referred to, and wedging them tightly between cap and sill.

Filling.—This method consists of filling the spaces between the members of the square set with any material such as waste rock, earth, or sand. When the filling is done it is retained within proper bounds, and the necessary passageways are kept open through the timbers by building crib-work around them as described. Waste rock for filling purposes is generally secured from the development or dead-work that is being prosecuted in other sections of the mine, but where a large quantity is required, it is often found necessary to mine it specially for that purpose, or draw it from the waste dumps on the surface. About

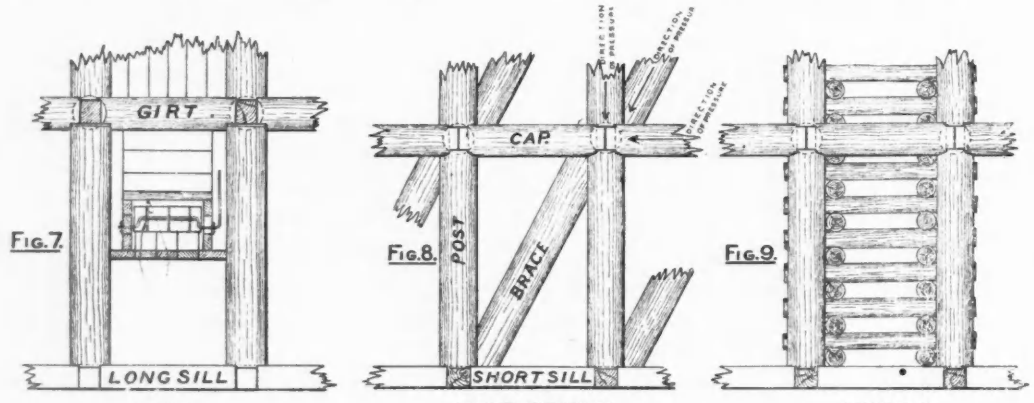


Fig. 7. CHUTE

Fig. 8. ANGLE BRACING

Fig. 9. CRIBBING

eight cubic yards of material is required to fill the vacant space of the frame of a square set, and the cost of such filling will be the cost of obtaining and placing such material, together with the crib work required to retain it within proper bounds.

General Remarks.—The square set system of timbering is used successfully and exclusively in all mines where large paying deposits of metaliferous ores occur.

Where favorable conditions, such as railway transportation and a moderate supply of timber exist, it is comparatively cheap. If care is taken in the construction of this system in the mine, it ensures that all the ore existing may be extracted without injury to the workman or the mine. Round logs or sawn timbers of any dimension, ranging from 8 inches upwards, may be used, but the sizes are governed by the economic conditions and mining requirements.

In the mines of Rossland, the round logs or timbers used for the square sets cost $1.20 for each log 16.5 feet in length f. o. b. the framing shed at the mine. These logs are cut in the State of Washington, and delivered over the Spokane Falls & Northern Railway on flat cars, over distances ranging from 45 to 75 miles, each flat car being loaded on an average with 60 logs. The unloading at the framing shed is done in a few minutes by cutting off the retaining standards on the flat cars, and allowing the logs to roll off on the storage platform. Of course, where wagon transportation is required from the railway terminus, the expense will be correspondingly increased.

In every mining camp there will be more or less variation in the method of framing, and in the cost of the square sets in place, also in the tonnage of ore to be extracted from the space occupied by each square set.

Where the dip of the vein is at a flat angle or the walls are bad, shorter posts than those described herein will probably be more advantageous; the more vertical dip of the ore deposit, the longer the posts may be, and vice versa.

Where sawn lumber is comparatively cheap, 3-inch plank is preferable to lagging poles for floors, on account of the better floor it offers for shoveling, and the fact that it may be removed and re-used.

ORE DEPOSITS IN THE SAN JUAN MOUNTAINS, COLORADO.*

The region described is known as the Silverton quadrangle, and corresponds to the Silverton atlas sheet of the United States Geological Survey. It embraces about 250 square miles.

The first attempt to prospect this rugged country, in 1860, resulted in failure, and it was not resumed until 1870. During the early seventies the region north and northeast of the town of Silverton was actively prospected, and nearly every lode which has since proved valuable was located. Paying ore, chiefly argentiferous galena and tetrahedrite, was taken out in large quantities, particularly from the North Star Mine, on the outskirts of Silverton.

In 1881 remarkable deposits of highly argentiferous copper ores were discovered near Red Mountain, and prospectors swarmed into this new field. The Yankee Girl ore-body was struck in 1882, and, with the Guston, shipped large quantities of high-grade silver ore for over 14 years.

With some notable exceptions, the mines of the Silverton quadrangle produce ores in which silver and lead are the predominant metals. The rapid decline in the value of silver in 1892 and succeeding years resulted in the closing of many mines previously productive. At the present time, however, there is much healthy activity, and it is likely that the future will see a great and permanent increase in the productive development of large and persistent ore bodies of low average grade.

The quadrangle comprises parts of several counties and has shipped ores to various smelters. The value of the total product to the close of 1900 is estimated at something over $35,000,000. The greater part of this has been silver, but during recent years, owing to the activity of the Camp Bird, Tomboy and Gold King mines, the gold output has greatly predominated and is steadily increasing.

The rocks of the San Juan comprise a thick, nearly horizontal series of volcanics, probably of Tertiary age, resting upon an eroded basement of Precambrian, Paleozoic and Mesozoic rocks. Both the old basement and the volcanic rocks are cut by intrusive masses ranging in composition from diorite to granite. The volcanics are divisible into three groups. The lowest of these is the San Juan series, consisting of gray andesitic tuffs and breccias, and attaining a thickness of at least 2,500 feet. Overlying the San Juan series is the Silverton series, made up of alternations of andesitic flows and tuffs with rhyolitic flows, flow-breccias and tuffs, with a maximum thickness of 5,000 feet. Above the Silverton series lies the Potosi series of light-colored rhyolites.

The San Juan and Silverton series cover by far the greater part of the region, and, with the intrusive masses, contain the important ore bodies.

The ore deposits of the Silverton quadrangle may be conveniently described under three heads: (1) Lodes[1], (2) stocks, or masses, and (3) metasomatic replacements. To the first class belong by far the greater number of the deposits that are being worked at the present time. They are the "veins" or "fissure-veins," such as are exploited in the Silver Lake, Iowa, Tiger, Sunnyside, Gold King, Camp Bird and Tomboy mines. To the second class are assigned most of the ore bodies formerly worked near Red Mountain, often locally known as "chimneys." Such were the deposits of the famous Yankee Girl and Guston mines. In the third class, by far the least important in this region, are placed a few deposits occurring in limestones or in rhyolite.

The lode fissures show great variety of trend, but northeast-southwest and northwest-southeast fissures predominate in number and persistency. Valuable deposits are not limited to lodes of any particular direction. The dips of the lodes are steep—usually over 75°. The fissures are exceedingly abundant and prominent, and the region as a whole is heavily mineralized. The date of the fissuring and mineralization is comparatively recent, probably late Tertiary, but possibly Pleistocene.

The ores of the lodes range from those consisting of galena with very little quartz and carrying inconsiderable amounts of silver and gold, such as that of the Royal Tiger Mine, to siliceous gold ores, such as that of the Tomboy, consisting principally of white quartz with inconspicuous pyrite and free gold. Among ores of intermediate character may be mentioned that of the Silver Lake Mine, consisting of galena, sphalerite, chalcopyrite, pyrite and quartz, in which about half the value is in gold and the rest in lead and silver. Other lodes, such as those of the North Star and Empire mines, near Silverton, or the North Star, on King Solomon Mountain, overlooking Silver Lake, contain abundant tetrahedrite, usually agentiferous and commonly associated with galena, chalcopyrite, pyrite, sphalerite, quartz and barite. Various sulphobismuthites of silver and lead occur in many of the lodes in the northern part of the area, notably the mineral alaskite in the Alaska Mine, in Poughkeepsie Gulch.

Among the other important vein minerals of the district may be cited proustite, argentite, bornite, bismuthite, tellurides of gold and silver (hessite and probably calaverite), native silver and copper, and the tungstate of manganese and iron, hübnerite.

In most of the workable veins and simple lodes, pay ore is usually, although not invariably, found wherever the fissure is wide enough to hold an ore body. The changes which take place in pay shoots with depth are exceedingly important in mining operations. Unlike the auriferous lodes of California, which rarely show any progressive or regular change in the character of their ores even to depths of 2,500 feet, the pay shoots of the Silverton quadrangle are less constant and show variations dependent upon the mineralogical character of the ore.

Generally speaking, the lode ores of the Silverton quadrangle are of low grade and require careful mining and milling to yield profitable returns. The ores which have been worked vary in value from a probable minimum of about $6 to several thousand dollars per ton. The extremely high values, however, are for ores carrying free gold, occurring only in small amounts in pockets in otherwise low-grade lodes, or in very small veins.

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* Abstract of *Bulletin* 182, United States Geological Survey on the "Economic Geology of the Silverton Quadrangle, Colorado," by E. L. Ransome.

[1] Lode is used as a general term, including simple fissure veins and more complex deposits of generally tabular form, filling fissure spaces, and including such altered and mineralized country-rock as may be regarded as ore.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

CO-TENANTS HAVE EACH THE BENEFIT OF WORK DONE ON MINING CLAIM.—Where the question was whether $100 worth of work had been done on a mining claim in the year 1898, and the witnesses of complainant was to the effect that it had been done, and a witness of the defendant stated that in 1897 the tunnel (the only work done) was in depth 35 or 40 feet, and another witness of the defendant testified that in the fall of 1897 it was 40 or 50 feet, saying that he had measured it the day before and found it to be 89 feet, and further testified that 12 or 14 feet of work was done after December 31, 1898, and defendant's witnesses testified that they estimated the work on the tunnel to cost $4 to $5 per foot, such evidence was sufficient to show that over $100 worth of work had been done in the year 1898. If the required amount of work is done, it is immaterial whether all of the co-tenants do their proportionate part of such work. where it is shown that the required amount of work has been done, it will be presumed, in the absence of evidence to the contrary, that it was done by the co-tenants or some of them. And where one of several co-tenants attempts to relocate a mining claim his act enures to the benefit of all the co-tenants. The mere lapse of time does not dissolve the relationship of co-tenancy.—Yarwood v. Johnson (70 *Pacific Reporter*, 124); Supreme Court of Washington.

SUFFICIENT STATEMENT OF FRAUDULENT ACT IN RELOCATING MINING CLAIM.—A complaint alleged that one of the defendants, who was a co-tenant of the complainant in a certain mining claim, had relocated the claim on behalf of another, and that it was not open to relocation, as all the required work had been done on the claim; but that if it had not been done it was owing to the fraud of such defendant, who had for consideration contracted with complainant to do the latter's required work. The prayer was for an accounting, injunctive relief, that complainant be decreed the owner of a certain interest, and for general relief. Defendant urged that the complaint was defective in that the specific cause of action for relief was uncertain. The court held that the contention had no merit, the cause of action being the withholding of the interest; and if the required work had been done the relocation was a cloud on complainant's title, and if not defendant might be found to be a trustee, and such relief as the pleadings and evidence warranted might be given under the prayer for general relief. And it was proper for the lower court not to compel the plaintiff to elect whether he would stand on the allegation that the required amount of work was not done, or that if not it was through the fraud, etc., of the defendant; since more than one set of facts might establish the wrong complained of.—Yarwood v. Johnson (70 *Pacific Reporter*, 123); Supreme Court of Washington.

WHEN ACT OF FOREMAN IS THAT OF A FELLOW-SERVANT AND COMPANY NOT LIABLE.—A coal yard was provided with steel cables, on which, in unloading a vessel, buckets holding about a ton were lifted and hauled to the point where the coal was to be dumped, where a devise called a tripper or dumper, coming in contact with the latch on the bucket, caused it to empty. The trippers ran on trolley wheels along the cables and were moved to and held in proper place by ropes. When the place of emptying the buckets was changed, one or two of the workmen handled the rope and another, standing by the tripper, told him when it was at the proper place. The foreman, wishing to empty coal into a certain hopper, directed two men to let the tripper down to such hopper, and said he would tell them when it was in the right place; this being commonly done by members of the force doing the general work. They let it down 10 or 15 feet too far, and before it was pulled back a bucket of coal was hauled up on the cable and emptied at such point just as another employee, working in the yard in the performance of his duties, passed under, and he was injured. There was no defect in the apparatus, and no negligence claimed, other than in placing the tripper in the wrong place. The court held that in assisting in the change in the tripper the foreman acted as a fellow-servant of the injured employee, and that the coal company was not liable for the negligent manner in which such work had been done.—Okonski v. Pennsylvania Coal Company (90 *Northwestern Reporter*, 429); Supreme Court of Wisconsin.

WHEN PARTIES TO A MINING CONTRACT ARE NOT PARTNERS.—A mining partnership can exist only where several parties co-operate in working the mining property; mere ownership as tenants in common not being sufficient. In a mining partnership pure and simple one partner has no implied authority to borrow money on the credit of the firm, but his implied powers only permit him to bind his co-partners by dealings on credit for the purpose of working the mine, where it appears to be necessary or usual in the management of the business. An agreement where certain parties furnish one of their number with a fixed amount of money, he to go to Alaska, and prospect for a mine, and they during his absence to furnish his family with a stipulated monthly allowance for its maintenance, each of the parties to have a certain prescribed interest in whatever was found, could not be construed as binding the others for expenses incurred by the prospecting party for personal supplies after, or even before, the sum originally furnished had been exhausted. But, where a mining contract did not make the parties to same liable for supplies furnished one of the number, yet a letter written him by one of their number authorizing him to buy the supplies could not have the effect to bind the other parties, in the absence of evidence that they knew of or authorized its being written. Such letter would be admissible against the one who wrote it as to supplies bought from a party after such party had seen it; but not supplies bought before it was written.—Hartney v. Gosling (68 *Pacific Reporter*, 1118); Supreme Court of Wyoming.

ABSTRACTS OF OFFICIAL REPORTS.

Greene Consolidated Copper Company.

This company's report, which covers the period from its organization up to July 31, 1902, is chiefly devoted to descriptions of the property and organization of the company. The total investments of the company to that date amounted to $7,293,294. Its capital account, condensed, is as follows:

Capital stock	$6,000,000
Working capital	2,151,834
Share premium account	2,343,745
Railroad bond certificates	68,000
Accounts and notes payable	1,056,646
Total liabilities	$11,620,225
Paid for Cananea Con. Copper Co. stock	$5,000,000
Advances to Cananea Con. Copper Co.	6,200,021
Sundry assets	27,975
Cash	41,855
Balance of operating account	350,374
Total assets	$11,620,225

The total gains from operations at Cananea up to July 31, 1902, were $802,833. Of this amount $417,670 has been credited to reserves and $385,163 to profit and loss.

The President's report says: "In submitting the first regular report that has been made of the Greene Consolidated Copper Company, it has been considered advisable to give a complete description of its property. In addition to statement of the financial condition of your company, detail statement is submitted, which will give an idea of the extent and magnitude of the undertaking. During the past year the general policy inaugurated at the meeting of the stockholders of the company, held February 26, 1901, namely, the installation of a plant and equipment upon your property necessary for the production of 6,000,000 pounds of copper per month, has been followed, and it is with pleasure that I am able to state that this installation has now been practically completed.

"Development of the mines belonging to the company has been pushed with all possible speed compatible with economy, and the ore bodies now exposed will justify in the near future a very large increase in the reduction capacity beyond that now in operation. As shown in the statement of investments at Cananea, the total amount expended in the development and equipment of the property to July 31, 1902, has been $3,682,073 in the mining division, $1,671,247 in the reduction division and $1,837,968 in the miscellaneous investments. The issue of 100,000 shares of the capital stock of the company authorized at the stockholders' meeting of July 22, 1901, has been entirely disposed of, realizing the amount of $3,344,904.

"After the decisions of the Supreme Court of Mexico in favor of your company in what were known as the 'Cobre Grande suits,' the titles to the several mines involved were canceled, the property redenounced and final patent issued directly to the Cananea Consolidated Copper Company by the Mexican Government, thereby rendering this title secure against any future attack. Decisions in the two cases in the Arizona courts known as the Hallenborg suits, have been rendered in favor of your company. There are now no suits pending affecting the title of the company to any of its property.

"The area of the mineral lands of the company aggregate 10,408 acres. Upon a considerable portion of the undeveloped area of this ground, surface croppings of equal grade and extent to those on the developed sections are found, and upon exploitation will undoubtedly lead to the discovery of further extensive ore bodies.

"The standard-gauge railroad from the reduction works at Cananea to Naco has been completed, thereby effecting a reduction in the cost of transportation between Cananea and New York of over $20 per ton. On May 1, that portion of the railroad between Cananea and Naco, was sold to the Cananea, Yaqui River & Pacific Company, a part consideration for this sale having been a very favorable traffic contract for the transportation of copper, coke, coal and lumber for 25 years. The object of building this railroad was to secure cheap transportation, and as it was possible to secure lower rates through an arrangement with the Cananea, Yaqui River & Pacific Company than could have been realized by the operation of the railroad by your company, it was deemed advisable to conclude the sale.

"The balance due on account of purchase of 486,000 acres of grazing and timber land has been paid. The grazing lands have been leased to the Cananea Cattle Company for a term of eight years on advantageous terms. Since the purchase of this tract, timber and wood cut from this land has been credited to this account at market price. The amount of these credits to August 31, 1902, was $243,000, in addition to which the sum of $57,527 has been received from sale of building lots in Cananea municipality. This landed property could be disposed of at double the price at which purchased by this company.

"Commencing October 1 the total expenditures for construction and operation at Cananea were reduced to 6½ cents per pound of copper produced. The direct cost of labor, fuel, supplies and material for mining the ore, transporting to the smelter and reducing to metallic form amounts to 4⅛ cents per pound of copper produced under present conditions. Upon the present basis of production of 5,000,000 pounds per month, the estimated net profits of operation at the present selling price of copper are $250,000 per month, which will be increased as the production increases. The depreciation in the price of copper from 17 to 11 and 12 cents per pound has retarded the payment of dividends by the company; but the finances of the company are in good condition and dividend payments will soon be resumed. Six smelters are now in operation and the seventh will be put in commission about November 10.

The converter plant of the company is now completed and has a capacity for producing 8,000,000 pounds of copper per month.

"Owing to the great extent of the mining property of the company, a very large amount of development work must necessarily be done for several years to come. Eight main working shafts are now being operated, and it is the intention in the future, as it has been in the past, that mine development shall at all times more than keep pace with ore extraction. The mining developments during the past year have been extremely satisfactory, some of the largest bodies of copper ore known to the mining world having been opened up.

"Nothwithstanding the short time that your company has been actively operating, we have now attained a depth at Veta Grande Shaft No. 5 of about 700 feet on the strike of the ledge below the surface croppings; upon the Capote and Oversight sections, of 750 feet below the surface croppings; upon the Elisa, 540 feet vertical depth below the surface, and at the Ventura, 700 feet. Sinking on all of these workings will be kept up and the corresponding levels run as rapidly as possible."

Anglo-Sicilian Sulphur Company, Limited.

This is the Sicilian brimstone producers' combination, financed by British capitalists.

In the sixth financial year, ended July 31, 1902, the gross profits on the year's trading amounted to £114,671. To this must be added interest on temporary investments, and other receipts, including £5,000 paid to the company for the cancellation of a contract with certain refiners, bringing the gross profits up to £127,064. After deducting working expenses and writing off £7,465 for depreciation in investments, and making further provision against doubtful debts of £3,000, there remains a net profit of £89,278. Out of this an interim dividend at the rate of 6 per cent per annum on the amount paid up per preference share for the six months to January 31, 1902, was paid in April last, absorbing £17,167, less income-tax. It is now proposed to pay a further dividend of £18,430, less income-tax, for the second half of the year, which will make a total distribution on the preference shares of £35,598, or 6 per cent, less income tax, for the year ended July 31, 1902. Of the balance, £10,736, or 20 per cent, has been credited to the capital guarantee fund, which now stands at £64,626. A further sum of £20,499 has been added to the reserve against any eventual depreciation of stocks of sulphur, which now amounts to £57,029. The general reserve fund stands at £121,982, making the capital guarantee fund, as above, a reserve of £186,609, besides the £57,029 held in reserve on account of sulphur stocks. After reserving £3,000 for income-tax, the remainder is divisible in dividends.

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.

Fifteenth Annual Report of the Commissioner of Industrial Statistics of Rhode Island. Henry E. Tiepke, Commissioner. Providence, R. I.; State Printer. Pages, 412.

Abstract of the Mining Laws in Force in the Philippine Archipelago. Compiled by First Lieutenant Charles H. Burritt, in charge of Mining Bureau. Manila, P. I.; Bureau of Public Printing. Pages, 232.

Theorie des Moteurs a Gaz. Conferences Faites a l'Automobile Club de France. By George Moreau. Paris, France; Ch. Beranger. Pages, 224; with diagrams.

University of Texas Mineral Survey. Bulletin No. 4. The Terlingua Quicksilver Deposits, Brewster County. Dr. William B. Phillips, Director of the Survey. Austin, Texas; published by the University. Pages, 72; with maps and illustrations.

Die Entwickelung des Niederrheinisch—Westfalischen Steinkohlen Bergbaues in der Zweiten Hälfte des 19 Jahrhunderts. W. Gewinnungsarbeiten und Wasserhaltung. Berlin, Germany; Julius Springer. Pages, 374; with 18 tables and 192 illustrations in text.

Lead Smelting. The Construction, Equipment and Operation of Lead Blast Furnaces. By Dr. Malvern W. Iles. New York; John Wiley & Sons. London; Chapman & Hall, Limited. Pages, 236; illustrated. Price, $2.50.

The Witwatersrand Gold-fields. Banket and Mining Practice. By S. J. Truscott. London; Macmillan & Company. Pages, 520; illustrated. Price, $12.

BOOKS REVIEWED.

A Classified List of Minerals, Precious and Other Stones. By Felix J. Noughton. New York; the Abbey Press. Pages 26.

Taken simply as a list, this little book might be of some service. It will not, however, supersede the established works on minerology. The descriptions appended are too brief and indefinite to be of any use, and in fact it is not easy to see that there is any special place for the work, either with the student or the mineralogist.

The Foundations of Geometry. By Dr. David Hilbert. Authorized translation by Dr. E. J. Townsend. Chicago; the Open Court Publishing Company. Pages, 132. Price, $1.

The material contained in this volume was given in substance as a course of lectures delivered by Dr. Hilbert at the University of Göttingen. It was subsequently rearranged and put into more complete form by the author. As it now appears, it is a volume which will be of interest to students of mathematics, as embodying the views of a distinguished instructor.

Heating and Ventilating Buildings; a Manual for Heating Engineers and Architects. By Rolla C. Carpenter. Fourth edition, revised and enlarged. New York; John Wiley & Sons. Pages, 562; profusely illustrated. Price, $4.

Since the first publication of this well-known treatise in 1895 three editions have been printed and sold. In the present edition it has been rewritten to a large extent, and its size has been increased by nearly one-third. Three new chapters have been added; one relating to the fan, or blower, for moving air, another to mechanical systems of heating and ventilating, and a third to school-house heating and ventilation. In its present form the book describes the latest improvements in the art of heating and ventilating; and gives directions for the construction and installation of the various systems that are now in use.

This admirable work ought to be satisfactory to any one who is interested in the subject. It is more than a treatise; it is a treatise and handbook combined, being replete with engineering tables, for which one ordinarily refers to the standard pocket-books, but it is much richer in those pertaining to the special subject than any of the pocket-books. The book is especially for the engineer, its presentation of the principles of the science and art being analytical and accompanied by many algebraic demonstrations, but there is much, very much, in it which is of value to and within the understanding of those who are interested in the art and are not engineers. Prof. Carpenter has a particularly concise and pleasant way of stating the fundamental principles of physics and pure science so that they will be understood by any one.

A treatise on heating and ventilation necessarily covers many topics which are of importance to other arts, such as the properties of steam, transmission and radiation of heat, the movement of gases and their flow through pipes, etc., and we think that chemical and metallurgical engineers will find this book of value for its treatment of those subjects alone, if for nothing else. In many metallurgical works the questions of heating and ventilation do not require consideration; in many, however, they are important, and to engineers who have such problems in hand Prof. Carpenter's book is recommended.

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.

Working a Hydraulic Elevator from a Pump.

Sir: In your paper of October 11, under the head of Questions and Answers, there is a query by S. A. T. as to working pumps direct into hydraulic elevators and as to what success is met with. Your comment that the plan would be "of doubtful economy" is good. But we know of several instances in the northern section of Georgia where this plan has been adopted with both elevators and giants. And so far as the mechanical success is concerned there is no doubt as to it. The elevator and giants perform to the full as efficiently with direct pumping as with a reservoir head. The financial success of the plan requires much investigation and calculation, and the local conditions of each plant can alone determine this part.

THE MECKLENBURG IRON WORKS.

Charlotte, N. C., Oct. 23, 1902.

Sir: One of your correspondents asks if a hydraulic elevator can be operated by a pump. I can answer in the affirmative, as I used one for two years successfully, raising the gravel 12 to 15 feet. The elevator, which had a 1⅛-inch nozzle, lifted all the gravel in the water coming from a giant with 1⅛-inch nozzle. It would lift one cubic yard per minute without being overloaded. Two pumps were used, one for supplying the giant and one for the elevator. The boiler used to furnish steam was rated at 60 horse-power, and the elevator used was made on the grounds by the carpenters. The size of the elevator should, of course, be in proportion to the capacity of the pump or it will not work well. I should be pleased to furnish any more particulars required about this installation.

J. D. REID.

Philadelphia, Oct. 16, 1902.

QUESTIONS AND ANSWERS.

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

Pertenencia.—Can you tell me what is a Mexican pertenencia?—W. B. W.

Answer.—In Mexico pertenencia is a name applied to a mining claim or grant. It is a legal term there, and corresponds to our word claim.

Lithia-Mica.—Is lithia-mica valuable as a source of lithia? If so, whom may I address for particulars?—A. B. S.

Answer.—The chief source of lithia heretofore has been spodumene. Recently, however, especially since the discovery of large deposits of lithia-mica or lepidolite in Southern California, attention has been drawn to this mineral as source of the lithia which is now extensively used in medical and other preparations. You can obtain particulars from Mess. W. J. Schieffelin & Co., 170 William street, New York, that firm handling the great part of lithia which is used commercially.

Lignite Briquettes.—Can you inform me of any firms making briquettes from lignite on this continent or elsewhere?—W. S.

Answer.—In the United States the manufacture of briquettes from lignite has been carried on to some extent in Texas. The briquetting of coal while entirely successful mechanically, in this country has not been a success commercially so far, the reason being found entirely in the abundant supply and low price of bituminous coal. This has made it difficult for any manufactured fuel to compete. In Europe, however, the making briquettes from lignite is a very extensive business, especially in Germany where it is carried on by a large number of companies owning lignite deposits. The process is also in extensive use in France and to a lesser extent in Great Britain; in the last named country it is used chiefly for coal dust and culm.

Petroleum in Texas.—Could you give me any information concerning quality and quantity of petroleum produced in Atacosa, Live Oak and McMullen counties in Texas?—H. N. T.

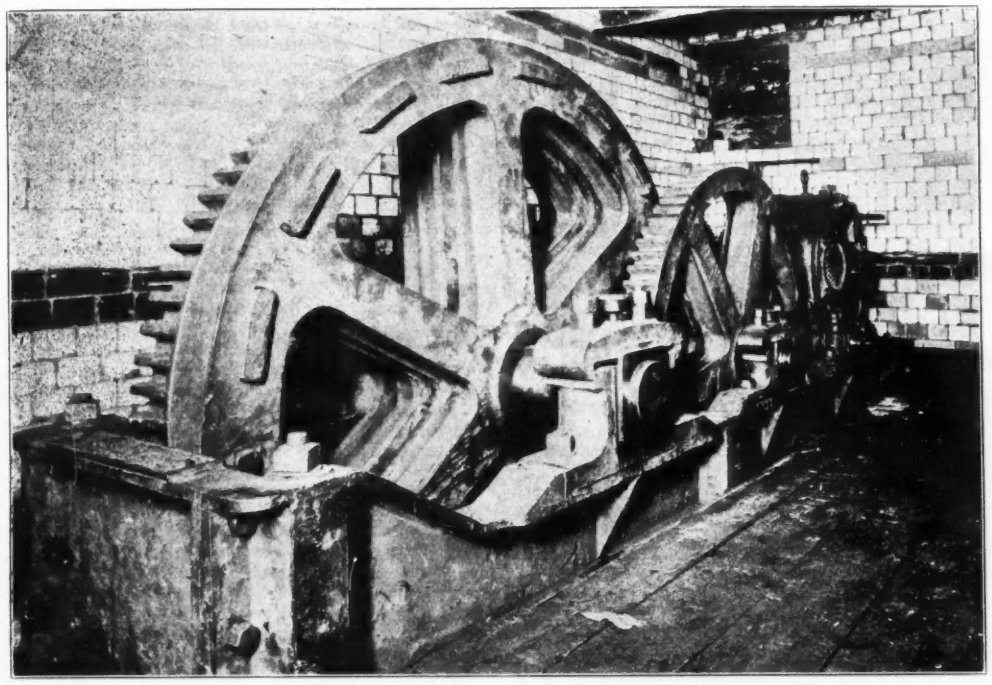
Answer.—You can obtain the information you want from *Bulletins* Nos. 1 and 2 of the Texas Geological Survey. These can be obtained from the Survey, the headquarters of which are at the State University, Austin, Texas.

Vanadium and Uranium Ores.—An analysis of ore, taken from a prospect mine shows 3.5 per cent. uranium and 0.75 per cent. vanadium. Will you please advise the value of each metal? Where can I find a market for such ore? What are these metals used for and is the demand limited?—E. F. B.

Answer.—The market for such ore as you refer to is limited. The two metals named are used to a limited extent in making alloys and vanadium oxide also finds some employment in dyeing; naturally the market is limited. The principal buyers in this country are the Primos Chemical Co. of Primos, Pa., Messrs. Asch & Denninger, Phœnixville, Pa.; Messrs. Poulot & Voilleque, Cashin, Colo. Abroad the metal is bought by the Geo. C. Blackwells Sons & Co., Liverpool, Eng., and the Tungsten and Rare Metals Company, 91 Blackfriars Ro d, London, S. E., Eng. You can obtain considerable information about the mining and sales of these metals from the reports of Mining Commissioner H. A. Lee, of Colorado. Your ore appears to be very low grade, but might be improved by concentration.

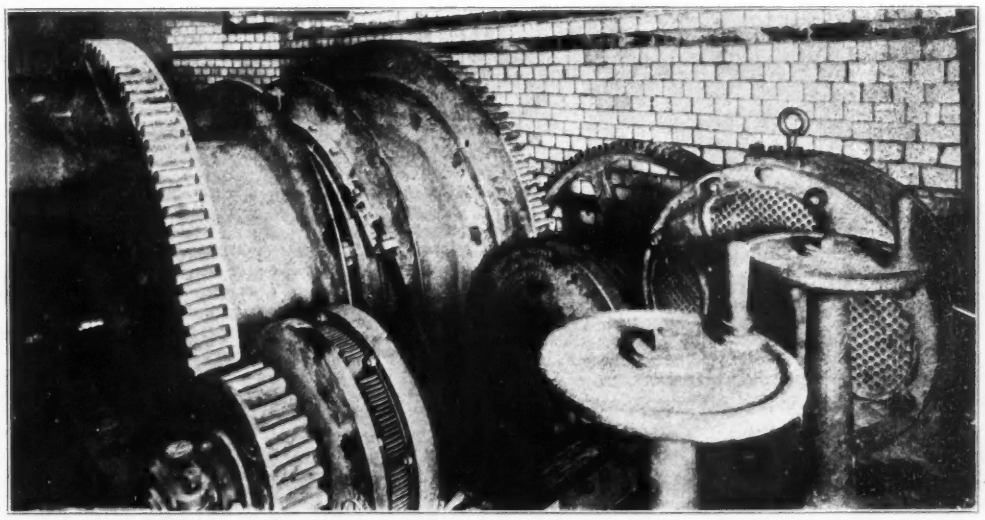
ELECTRICAL APPARATUS IN ENGLISH COAL MINES.

A feature in recent coal mining in Great Britain is that British operators have taken up the latest and most improved methods of coal mining even more rapidly than their American competitors. They have, moreover, adopted for power transmission alternating currents and induction motors, which, for mining work and especially for coal mining, have many great advantages over direct-current machinery. The facts are well illustrated in the following brief description of the electrical plants recently installed at a number of English coal mines.



INDUCTION MOTOR OPERATING MAIN-AND-TAIL HAULAGE, SNEYD COLLIERY, BURSLEM, STAFFORDSHIRE.

The Sneyd Colliery, at Burslem, Staffordshire, has recently put in a complete alternating-current equipment. Current is generated by a Westinghouse three-phase alternator, direct coupled to a Westinghouse steam engine. Westinghouse induction motors aggregating about 1,000 horse-power are used for driving main-and-tail and endless rope hauling engines, for pumps and for several other auxiliary purposes. These mines are gaseous and the use in them of direct-current machinery would have been dangerous. The induction motor, however, on account of the fact that it has no moving contacts to spark or flash, is entirely adapted for use in such locations.



INDUCTION MOTOR OPERATING ENDLESS HAULAGE, SNEYD COLLIERY, BURSLEM, STAFFORDSHIRE.

The Clapwell Colliery, of Chesterfield, has recently installed two three-phase Westinghouse alternators, one of 225 kilowatts capacity and the other of 20 kilowatts, together with a 6 kilowatts direct current exciter. The British Westinghouse Company also furnished 10 induction motors, aggregating 280 horse-power.

The Oxcroft Colliery, of Chesterfield, has installed two three-phase Westinghouse alternators, each of 200 kilowatts capacity and operating at 440 volts, 30 cycles per second and 100 r. p. m. The equipment includes two exciters, each of 11¼ kilowatts capacity, and a small generator of 1½ kilowatts capacity; also 13 Westinghouse induction motors with an aggregate capacity of 300 horse-power and a complete switchboard outfit for the entire plant.

About 4,000 horse-power of Westinghouse electrical apparatus is about to be installed in the several collieries owned by the Stavely Coal & Iron Company, of Chesterfield.

The Sherwood Colliery, of Mansfield, has purchased two three-phase Westinghouse alternators, each of 50 kilowatts capacity and operating at 440 volts, 60 cycles per second and 900 revolutions per minute; also three direct-current multipolar generators of about 12 kilowatts aggregate capacity.

At the Tredegar Iron & Coal Company's collieries in Monmouth a complete power equipment is being installed, comprising two 150-kilowatt, three-phase Westinghouse alternators, two exciters, each of 7½ kilowatts capacity, and ten induction motors ranging in size from 50 to 5 horse-power, and aggregating 220 horse-power.

The Belsover Colliery Company, of Chesterfield, has decided to adopt electric driving to a considerable extent, and has placed a large order with the British Westinghouse Company, including a 180-kilowatt, three-phase alternator, together with exciter, a 200 horse-power induction motor, complete switchboards, etc.

The Stanton Iron Works Company, of Pleasley, will equip its collieries with electrical apparatus, including about 150 kilowatts in generating capacity and 100 horse-power in motors, all purchased from the British Westinghouse Company.

The Tyrdail Collieries, of Carmarthen, have contracted for an electric power installation consisting of a 60-kilowatt, three-phase Westinghouse alternator, exciter, switchboard, and about 50 horse-power of induction motors.

The New Cross Hands Colliery, of Lanelly, has purchased an electrical power equipment consisting of a 125-kilowatt, direct-current Westinghouse generator, with switchboards, etc., complete, and several Westinghouse direct-current motors.

From the above examples it will be apparent that the British manufacturers are by no means slow to see the economies of electric driving, and when their mines have been thoroughly equipped they may yet for a long time give the Americans a very stiff fight for European markets.

THE AMERICAN OIL FILTER.

A new oil filter which has just been placed upon the market by the Burt Manufacturing Company, of Akron, Ohio, is shown in the accompanying illustration. This new filter has been especially devised by the Burt Company for the filtering of very heavy grades of oil which cannot be successfully cleaned in an ordinary filter because of the liability to clog. The claim is made that such oils are readily purified by this filter, and, therefore, it must give perfect results in the filtering of common engine oil. The fact that the oil is heated and thereby thinned immediately upon being poured into the filter accounts for its high speed of operation and superior capacity.

By referring to the illustration it will be seen that the pan for receiving the waste oil is surrounded by a hot water chamber, through which passes a steam coil pipe. When this chamber has been filled with warm water, and the lower part of the filter has also been filled with warm water until it flows from faucet 2, the filter is ready for operation, the proper steam connections, of

THE AMERICAN OIL FILTER.

course, having been previously made. The cleansing of the oil is then accomplished as follows:

Through the filtering material in the cylinder the oil makes its way into tube B and down onto the filter plate D, where the pressure of the oil above overcomes the resistance offered by the weight of the water, and spreads out in a very thin film, becoming thinner and thinner as it travels from the center to the circumference of the plate. Every particle of the oil is thus exposed to the action of the water. This process is repeated as the oil flows upon plates D1 and D2. The separation of every foreign ingredient from the oil is thus made complete. The remaining impurities then settle by force of gravity to the bottom of chamber E and are drained off by simply opening the valve. The pure oil is drawn from faucet 1.

One advantage claimed is the minimum of attention required by this filter. Any kind of filtering material may be used, or none at all, and the material may be removed without interrupting the oil service. The method of cleaning the filter is very simple, requiring only that the cylinder at the top be unscrewed, the filtering substance removed and the sediment pan lifted out and emptied of the dirt and grit which has collected in it through force of gravity. In this oil filter the bulk of the dirt is collected at the top, increasing the ease with which it may be cleaned. A large number of these filters are in use at different plants.

MINING MACHINERY EXPORTED FROM GREAT BRITAIN.—The mining machinery exports from Great Britain for the nine months ending September 30, are valued by the trade reports as below:

	1901.	1902.		Changes.
European Countries.....	£58,421	£35,892	D.	£22,529
South America	28,796	29,073	I.	277
South Africa	81,739	147,829	I.	66,090
East Indies	54,096	52,341	D.	1,755
Australia	100,156	69,435	D.	30,721
United States	904	1,165	I.	261
Other Countries	55,778	70,682	I.	14,904
Totals	£379,890	£406,417	I.	£26,527

The increase in exports to South Africa, though considerable, was not as large as had been expected. It will be noticed that there was a large decrease in sales to Australia.

PRODUCTION OF ZINC OXIDE.—In a recent issue of *Paints, Oils and Drugs,* Mr. August Heckscher, of the New Jersey Zinc Company, referred to the rapid increase in the production of zinc oxide in the United States. The output has been doubled during the last ten years, and unless all signs fail will double again in the next ten. (In 1891 the production was 23,700 tons; in 1900, 47,151.) The bulk of the zinc oxide, which is made and sold in the United States, is still manufactured from the New Jersey franklinite by means of the Wetherill process, but the carbonate ores of Arkansas and Missouri lend themselves to that process with almost equal success, except that the color of the product is not so reliable. The sale of oxide made by the combustion of spelter will probably never attain large proportions in the United States because of its much higher cost, although in whiteness and body it is superior to that made directly from ore. Zinc oxide has now become a pigment of recognized merit, and it is no longer necessary to hide it under the cloak of white lead.

PATENTS RELATING TO MINING AND METALLURGY.

UNITED STATES.

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

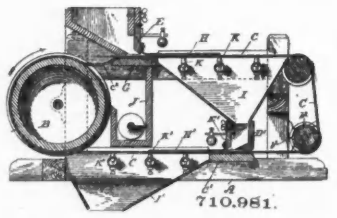
Week Ending October 14, 1902.

710,935. ROCK-DRILL.—Addison Avery, Lowell, Mass. The combination of the shaft lining or casing, the compressed-air engine secured in said casing, the drill-head rotated by said engine and having cutting-bits arranged to operate in advance of said casing and to make an opening of greater diameter than said casing, said engine being provided with a dust-chamber into which said engine exhausts and with a passage outward from said dust-chamber between said engine and casing, said drill-head being provided with dust-discharging openings leading from the front thereof into said dust-chamber to allow the dust and cuttings to be carried from the front of said drill-head back of said engine and out of said casing.

710,948. HOISTING AND CONVEYING APPARATUS.—Mark A. Callahan and Owen W. Callahan, Cleveland, Ohio. In a hoisting and conveying apparatus the combination with the carriage of a locking device secured to said carriage, a signaling device operated by said locking device to indicate its locked and unlocked position, and a hook adapted to be engaged by said locking device with means for raising and lowering said hook.

710,958. PROCESS OF WELDING ALUMINUM.—Mary W. Emmé, New York, N. Y. A process of welding aluminum, which consists in bringing the thoroughly-cleansed parts of aluminum to be united, into contact, and applying heat to the same until the metal begins to soften, whereby they may be welded or permanently united.

710,981 and 710,982. SEPARATOR.—Robert W. Jessup, San Francisco, Cal., assignor to Spiral Belt Separator Co., San Francisco, Cal. The combination of an endless traveling screen, a feeder to supply the material to the upper run of said screen, whereby certain of the particles will pass through the screen, and certain others will be carried by the screen and discharged from the foot of the separator, an auxiliary feeder under the upper run of the screen



to receive the particles passing through and to direct them upon the lower run of said screen, whereby certain of said particles will pass through said lower run to the outside, while certain others will be carried by the screen from the lower to the upper run and dropped therefrom, and a receptacle located between the upper and lower runs of the screen at a point away from the auxiliary feeder and below the first-mentioned feeder adapted to receive said other particles carried upwardly with and falling from the screen and from which said particles may be conducted away from the machine.

710,983. SEPARATOR.—Robert W. Jessup, San Francisco, Cal., assignor to Spiral Belt Separator Company, San Francisco, Cal. A separator consisting of an endless traveling flexible screen, means for supporting the screen to form a hanging loop or bight, a feeder arranged to deliver material to said hanging loop or bight, and means for varying the width of said loop or bight.

711,015. ORE-SEPARATOR.—Albert H. Stebbins, Little Rock, Ark. In a separator, the combination of a box-like frame, a separating-surface having perforations and supported above the bottom of said box-like frame to provide a space between the said bottom and separating-surface, means for introducing a blast of air or other fluid into said space beneath the separating-surface to stratify material upon said separating-surface, cutting and conveying boards supported above the separating-surface, to cut from the stratified material on the separating-surface the top portion of strata thereof and direct it out of the separator, the cutting and discharge edges of said boards being at different distances above the separating-surface.

711,026. MEANS FOR INSULATING COKE-OVENS, ETC.—Mahlon Updike, Chicago, Ill. The combination of an inner inclosing wall, an outer retaining-shell larger than and inclosing the wall and arranged to form a chamber between the two, buckstays retaining the shell in position, and insulating material positioned within chamber so formed.

711,031. PROCESS OF MAKING GRAPHITE.—Edward G. Acheson, Niagara Falls, N. Y. A method of making graphite, which consists in introducing into an electrical furnace a mass of carbon to be graphitized, in the form of lumps, and also introducing thereinto a volatilizable material capable of forming a carbid, and heating the same to a high temperature, vaporizing the volatilizable material, thereby causing the vapor to permeate the charge of lumps and to graphitize the same.

711,006. ELECTRIC FUSE FOR EXPLOSIVES.—Frederick Schroeder, New York, N. Y. The combination with a tube containing an igniting substance and provided with an external shoulder, of a coating of a soft material applied to said tube at the shoulder thereof.

711,012. METHOD OF EXCAVATING AND CONSTRUCTING TUNNELS OR OTHER SUBTERRANEAN OR SUBMARINE STRUCTURES.—Charles Sooysmith, New York, N. Y. A method of excavating which consists in, first, constructing a plurality of pilot-tunnels; second, establishing communication between the same; third, excavating the material surrounding the pilot-tunnels to the required line.

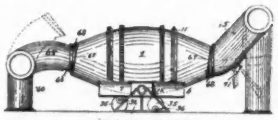
711,016. ORE-SEPARATOR.—Albert H. Stebbins, Little Rock, Ark. The combination of a box-like frame, a separating-surface provided with openings and supported above the bottom of said box-like frame, means for directing a blast of air or other fluid into said frame below the separating-surface, and a series of cutting and conveying boards arranged above and diagonally to the said separating-surface, said cutting and conveying boards being arranged with the cutting edges of adjacent boards at varying distances apart.

711,047. SAVING FINE GOLD AND SULPHURETS.—Francis M. Graham, San Jose, Cal. A process of concentrating precious metals from ores, which consists in causing the comminuted ores mingled with water to flow over the top of a stream of mercury flowing in the opposite direction, whereby the heavier particles, brought into immediate contact with the stream of mercury, are held back relatively to the lighter particles and separated therefrom and removing the heavier particles so separated.

711,059. PROCESS OF BRIQUETTING IRON-BEARING SUBSTANCES.—John H. Long, Chicago, Ill., assignor to Chisholm, Boyd & White Company. A process of briquetting consisting in mixing together soda and commercial common salt in such proportions as to render the mixture substantially non-deliquescent; and slaking calcium oxide with water to form cream of lime; then mixing said non-deliquescent salt and cream of lime with iron-

bearing substance for bonding the same, and subsequently compressing the final mixture into form.

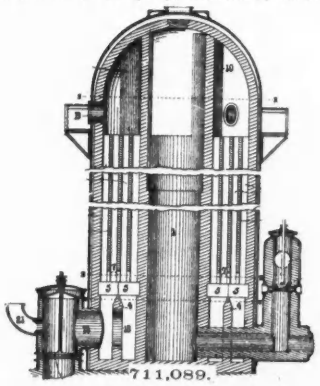
711,062. METALLURGICAL FURNACE.—Patrick Meehan, Lowellville, Ohio. A barrel-shaped furnace having an open neck at each end, heating pipes or flues arranged to



711,062.

be connected to and disconnected from said necks, a rotary frame on which said barrel is mounted, mechanism for rotating said frame, and mechanism for rotating the barrel in said frame.

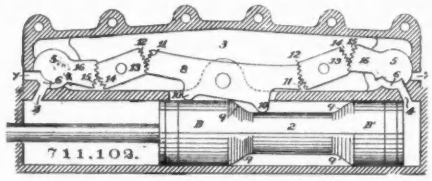
711,089. HOT-BLAST STOVE.—Samuel T. Wellman and Chas. H. Wellman, Cleveland, Ohio, assignors to Wellman-Seaver Engineering Company, Cleveland, Ohio. In a hot-



711,089.

blast stove, a central combustion-chamber or pass, and a plurality of segmental passes surrounding the central pass, all the passes connected to form a single continuous passage.

711,102. ROCK DRILL.—Arthur D. Foote, Grass Valley, Cal. The combination in a rock-drill of a piston and a cylinder in which it is reciprocable, valves located contiguous to the ends of the cylinder, a valve-chamber inclosing said



711,102.

valves, a rocker-arm having portions entering the cylinder and alternately engaged by the piston, and having its ends terminating short of the valves, and connections bridging the space between the ends of the rocker-arm and the valves.

711,138. ANNEALING APPARATUS.—Joseph J. Tynan, Philadelphia, Pa. In a device for annealing armor-plates and the like, the combination with a hydrocarbon-burner of a device supported independently of said burner, constructed and arranged to localize the heating action of the flame.

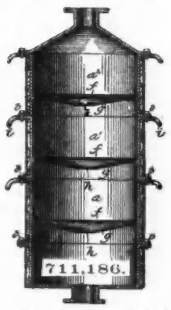
711,166. ARTIFICIAL-FUEL BRIQUETTE.—William A. Koneman, Chicago, Ill., assignor to International Fuel Company, Chicago, Ill. A process of making artificial fuel, which consists in subjecting bones to the action of steam to produce therefrom a crude extract containing their gluten and chondrin constituents, mixing the said crude extract in a diluted state and in proper proportion with finely-divided carbonaceous material, molding the mixture into briquettes, and finally drying the briquettes.

711,167. ARTIFICIAL FUEL.—William A. Köneman, Chicago, Ill., assignor to International Fuel Company, Chicago, Ill. A method of manufacturing an artificial-fuel briquette, which consists in reducing a non-coking coal to a pulverulent condition, reducing a coking-coal to a pulverulent, or approximately pulverulent, condition, mixing the two together with an agglutinant and forming the mixture into briquettes.

711,173. PROCESS OF RECOVERING METALLIC COPPER FROM COPPER PRECIPITATE.—Duncan McKechnie, Liverpool, England. A process of recovering metallic copper from copper precipitate, consisting in forming the precipitate into bricks, briquettes or the like and drying the same, then smelting and subjecting the bricks to a reducing action in a cupola or blast furnace, drawing the material into a reverberatory furnace, maintaining the material in a molten condition, and separating the copper from the slag while the material is in the molten state.

711,236. APPARATUS FOR USE IN EXTRACTING PRECIOUS METALS FROM THEIR ORES.—Hudson Smith and Peter C. Brown, Salt Lake City, Utah. In a lixiviation apparatus, a revoluble tank for containing ores, a pipe extending through one end of the tank and extending upward almost to the internal wall, means for rotating the tank and pipes for supplying a solvent solution, air and steam to the tank.

711,186. APPARATUS FOR MAKING SULPHURIC ACID BY THE CONTACT PROCESS.—George C. Stone, Jersey City, N. J., assignor to the New Jersey Zinc Company. Apparatus for use in the contact process, comprising a



711,186.

series of compartments of sections, independently separable and removable, said sections containing each an individual charge of contact material in combination with gas inlet and outlet ducts.

711,187. METHOD OF SEPARATING AND RECOVERING ARSENIC-FUMES FROM FURNACE-GASES.—George C. Stone, Jersey City, N. J., assignor to the New Jersey Zinc Company. In the manufacture of sulphuric acid and sulphuric anhydride from furnace-gases, the method of removing fumes of arsenic and the like from said gases, which consists in first cooling the gases to substantially the temperature of deposition of said fumes, and immediately separating and recovering said fumes upon and within a body of filter material, and subsequently recovering the said arsenic or the like by subjecting the filter-body to the action of heat until the substances separated are again volatilized, and finally condensing the products of volatilization.

711,242. FUEL BLOCK OR BRIQUETTE.—Francois Chailly, New York, N. Y., assignor to Standard Briquette Company. A fuel block or briquette composed of comminuted fuel and a binder of plaster-of-paris and dextrine, substantially as set forth.

711,254. COMPOSITION FOR ARTIFICIAL STONE.—Heinrich Mielck, New York, N. Y., assignor to Mielck's Stone and Terra Cotta Company. A composition for artificial stone, consisting of kaolin, sand, burnt magnesia, and a solution of magnesium chloride.

711,268. RETORT COKE-OVEN.—John F. Wilcox and Dietrich E. Wagener, Cleveland, Ohio, assignors to Retort Coke Oven Company, Cleveland, Ohio. The combination of retort coking-ovens, with means for heating air, combustion-flues, a main hot-air-intake flue or flues leading to the combustion-flues, and a main offtake flue or flues, said main flues being above the ovens.

711,281. COMBINED METALLURGIC FURNACE AND PRECIPITATING WATER-TANK.—Guy Bryan, St. Louis, Mo. A metallurgic furnace; a condensing down-flue in communication therewith, a precipitating water-tank with the waste-gas-receiving compartment therein, connected to the down-flue, the waste-gas expelling compartment therein, communicating with a chimney, and a compartment open to atmospheric air, attached to the tank for the withdrawal of the precipitate from the tank; in combination with means for transferring the waste gases from the receiving to the expelling compartment, and with water-sealing partition-walls, dividing the waste-gas-compartments from each other, and dividing them from the compartment open to atmospheric air.

711,319. OBJECT OF REFRACTORY MATERIAL AND METHOD OF MANUFACTURING SAME.— Charles B. Jacobs, East Orange, N. J., assignor, by mesne assignments, to George S. Ettla, Niagara Falls, N. Y. A process of manufacturing bricks or other objects of refractory silicious material containing an excess of silica, which consists in fusing such material in the electric furnace, maintaining the material in a state of fusion until a substantial portion of the silica contained in the material is volatilized, and casting the fused product in molds.

711,329. PROCESS OF PRODUCING ARTIFICIAL STONE.—Heinrich Mielck, New York, N. Y., assignor to Mielck's Stone and Terra Cotta Company. A herein-described process of making artificial stone, which consists in intimately mixing sand, burnt magnesia and a concentrated solution of magnesium chloride in substantially the proportions specified, tamping the mass into shape, and confining the thus compacted mass at all sides during the resulting slow reaction.

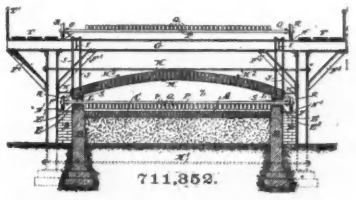
711,331. SLAG STEAM-GENERATOR.—George Mitchell, Naco, Ariz., assignor of one-half to L. D. Copeland, Los Angeles, Cal. In a slag steam-generator, the combination with a steam-generator provided with a removable sectional lining, of means for feeding slag into the water contained in the generator, means for discharging the slag from the lower portion of the generator, and means for maintaining the pressure within the generator while slag is being fed into and discharged from the same.

711,332. SLAG STEAM-GENERATOR.—George Mitchell, Naco, Ariz. In a slag steam-generator, the combination with a steam-generator provided with a feed-opening, and a plate or disk within the generator constructed with a discharge-opening, of a movable open-ended slag-chamber located within the generator and adapted to be moved so that its upper and lower ends will successively register with said feed and discharge openings.

711,333. PROCESS OF GENERATING STEAM FROM HOT SLAG, ETC.—George Mitchell, Naco, Ariz., and Lucius D. Copeland, Los Angeles, Cal. A process of generating a constant supply of steam under pressure from the heat contained in hot slag, consisting in feeding charges of hot slag by its gravity into contact with water confined under pressure in a steam-generator adapted to be closed steam-tight while the slag is being fed into the water and discharged therefrom.

711,338. REVOLVING FURNACE FOR ROASTING ORES.—Paul Naef, New York, N. Y. A revolving roasting-cylinder having two or more sets of apertured ore-lifting partitions which divide the cylinder into longitudinal compartments, with open spaces across the cylinder between the sets of partitions, the partitions of one set being radially and spirally like offset with respect to those of an adjacent set.

711,352. ROASTING-FURNACE.—Dennis Sheedy and Malvern W. Iles, Denver, Colo. A furnace adapted for roasting, drying, calcining and chloridizing of ores and other materials having in combination, a base or hearth, a frame extending over the sides and top of said base, angles supported by depending rods the upper ends of which



711,352.

are secured to the parts of the frame extending over the top of the base, and laterally braced by the vertical parts of said frame, a fixed top supported on said angles and entirely suspended from said frame, an endless carrier and conveying device extending longitudinally beneath and above the fixed top and means for moving said carrier.

711,380. PROCESS OF MANUFACTURING A SOLID COMBUSTIBLE FROM PETROLEUM, SULPHURIC ACID AND LIME.—Johan C. Berntrop and Marius L. Q. Van Ledden Hulsebosch, Amsterdam, Netherlands. A process for the manufacture of fuel from petroleum, which consists in dissolving rosin in petroleum, treating the solution with enough sulphuric acid to decompose the rosin, adding thereto slaked lime containing hygroscopic water while agitating the solution and briquetting the resulting product.

711,451. WIRE-ROPE TRAMWAY.—William C. Davis, Denver, Colo. In a wire-rope tramway system, the combination of a stationary cable and an endless traveling cable mounted above the stationary cable, a trolley mounted on the stationary cable, a bucket carried by the trolley, and a grip mounted on the trolley-frame and composed of a stationary jaw, a movable jaw fulcrumed on the frame and having an arm projecting below the fulcrum, a lever fulcrumed on the jaw-arm remote from the jaw proper, a link pivoted on the trolley-frame at one extremity and on the lever at the opposite extremity at a point beyond the connection of the jaw-arm with the lever, a roller mounted on the lever beyond its connection with the link, and a trip suitably mounted in the path of said roller for releasing the grip.

GREAT BRITAIN.

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

Week Ending October 2, 1902.

16,131 of 1901. TEMPERING STEEL.—R. A. Hadfield, Sheffield. Annealing and tempering steel by heating, then cooling slowly to ascertain extent, then reheating to a temperature not as high as at first, and so on.

16,132 of 1901. STEEL ALLOY.—R. A. Hadfield, Sheffield. Improvement on the inventors' chrome-nickel-steel, containing less carbon, to make it tougher.

2,456 of 1902. RECOVERING WASTE GASES.—A. H. Godwin and F. A. Keil, Margate. Recovering waste gases given off in the saturator used in making sulphate of ammonia from gas liquor.

5,637 of 1902. LEAD CARBONATE MAKING.—A. C. J. Charlier, Glasgow. Making carbonate of lead by treating litharge with carbonic acid introduced under considerable pressure.

16,272 of 1902. TREATING ZINC SLAGS.—F. Brünjes, Langelsheim, A. H., Germany. Treating copper slags containing zinc, iron, barium, etc., with hydrochloric acid, the barium, iron, etc., being dissolved and the zinc recovered as sulphide.

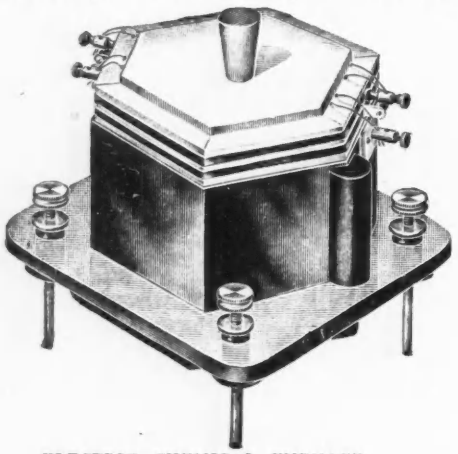
16,337 and 16,338 of 1902. FERRIC OXIDE RECOVERY.—A. S. Ramage, Cleveland, Ohio., U. S. A. Treating waste pickle liquors to form a hydrated basic ferric oxide suitable for a basis for paints.

17,325 of 1902. TREATMENT OF ALLOYS.—Ajax Metal Company, Philadelphia, U. S. A. Substituting one metal for another in brasses by melting in contact with a compound of a metal whose heat of formation is less than that of the metal to be eliminated.

NEW ELECTRIC FURNACES FOR THE LABORATORY.

The well-known firm of Eimer & Amend, of New York, is now introducing new forms of electric-chemical furnaces. These furnaces are specially constructed for chemical work in the qualitative, quantitative and metallurgical laboratories. Advantages claimed for these electric furnaces over any other electric furnace are, that they are strong and compact, and are built in sections, so that all parts can readily be replaced in case of accident. They require the regular electric light, 110-volt, current, and are not liable to get out of order. The further advantages of these furnaces are that the inside surface is made of smooth material which does not crumble or crack, and the substance treated can readily be observed. The platinum ware used in these furnaces will last twice as long as in the old-fashioned blast lamp methods. The temperature in these furnaces ranges up to 1,500° C. (2,700° F.), in fact, to the melting point of platinum.

For the present the following six sizes will be made: These include a small size chemical furnace, taking the regular shape platinum crucibles of 10, 15, 20 and 30 c. c. capacity. Available inside space, 1 to 1½ by 1 to 1½ in.; current required, 10 amperes and 110 volts. The large size chemical furnace for 30, 40, 50 and 60 c. c. platinum; inside space 2 by 2 in.; current required, 12 amperes and 110 volts. The extra large hexagonal furnace, as used by Prof. Landolt, Prof. Traube in Berlin, and others, for atomic weight determinations, etc., having room for two platinum vessels for check work, etc. Current required, 15 amperes and 110 volts. This is the furnace shown in the illustration.



ELECTRIC CHEMICAL FURNACE.

Other forms include small and large sized muffle-shaped furnaces, and a sectional furnace for tubes; the last-named type permitting a wide range in the degree of heat applied. These furnaces will be found exceedingly useful in the laboratory.

GERMAN COAL SYNDICATES.—The London *Collicry Guardian* says: "The depression which continues to prevail in German industries in general has not taught the lesson which some of the customers consider it desirable should be given to the Rhenish-Westphalian Coal Syndicate on account of its maintaining prices on a basis which is disproportionate to the situation of affairs at the present time, whilst at the same time the organization enjoys the benefits of the further reduction in the wages of the miners, which has taken place this year. Complaints have been made in industrial circles for some months past —especially in the iron and steel branches—that the syndicate has taken too little into consideration the changed conditions under which consumers are compelled to carry on business, and the commencement of the last quarter of the year shows no indications of any alteration in the policy of the coal trade combination in that part of Germany. During the high period of prosperity two years ago the prices of various qualities of coal were advanced from 20 to 28 per cent, of coke from 60 to 93 per cent. and of crude iron from 59 to 98 per cent. The reductions which have been made by the syndicate since that time have, however, only ranged from 4 to 9 per cent in the case of coal, and 12 to 25 per cent for coke, whereas the diminution in the case of foundry pig as compared with 1,900 amounts to 40 per cent and to 46 per cent for Luxemburg puddling iron."

THE SOOCHAN MINES IN SIBERIA.—According to a recent consular report, Admiral Skrydloff, of the Russian Pacific squadron, has returned from a visit to the Soochan coal mines, where he went to inspect the plans of the proposed railroad, which will facilitate the working of the mines and the transportation of the coal to Vladivostok. Without the railroad, transportation would be difficult and expensive—45 to 50 kopeks (23.1 to 25.7 cents) per pood (36.112 pounds). By rail, the cost per pood will not exceed 12 kopeks (6.1 cents), including all expenses. The Pacific squadron uses Sakhalin coal, at 30 kopeks (15.4 cents) per pood, delivered. This coal has too much sulphur and needs assorting. The Naval Ministry has been interested in the Soochan mines for years. In addition to the low price, the coal is said to be smokeless. It is said that there are several veins which appear similar in quality and character. There is little ash; the coal burns freely and gives a large per centage of heat. The working of the mine was estimated as easy. The Ministry of Ways and Communications decided to construct the railroad, with the help of the Naval Ministry, 600,000 rubles ($309,000) being appropriated, but the tunnel obstacle ended the project for a time. The first plan was a narrow-gauge road, but now a wide gauge is proposed, with no tunnel. The new line will run through a country comparatively rich. It is thought it can be completed within a year. The work at the mine and also on the railroad can be done best in winter, when material and labor are cheap.

PERSONAL.

Mr. John Hays Hammond has gone to Nevada.

Mr. Thomas Rickard, of San Francisco, is in New York City.

Mr. C. A. Molson, of Salt Lake, was a recent visitor in Butte, Mont.

Mr. R. J. Kilpatrick, of Beatrice, Neb., recently visited mines near Hailey, Idaho.

Mr. Paul de Rilly, who has lately been to Ashantee, West Africa, is now in New York City.

Mr. Will G. Nebeker has gone to California to examine mine for Salt Lake, Utah, men.

Mr. John Hinchliffe, mayor of Patterson, N. J., has been visiting mines in the Coeur d'Alene country, Idaho.

Messrs. Alfred Skeeles and J. Bell, of Chicago, Ill., have been looking at mining properties about Central City, Colo.

Mr. Bernard MacDonald, manager of the Le Roi Mining Company, Rossland, B. C., was at Baker City, Ore., recently.

Mr. J. W. McQueen, secretary-treasurer of the Sloss-Sheffield Steel and Iron Company, is visiting Eastern cities.

Mr. Fred. W. Bradley, the well-known mining engineer of San Francisco, Cal., is in New York City on a business trip.

Mr. Frank L. Sizer has returned to Butte, Mont., after an absence of 4 months spent in the State of Chihuahua, Mex.

Mr. Walter Douglas, superintendent of the Copper Queen mines, has returned to Bisbee, Ariz., from a trip to the East.

Mr. Edw. L. Brayton, of the Pelton Water Wheel Company, San Francisco, Cal., has just been married in New York City.

Mr. J. L. Giroux, superintendent of the United Verde copper mines, at Jerome, Ariz., has returned from a trip to Illinois.

Mr. John Stanton, of New York City, has been inspecting the mines under his management in the Lake Superior copper district.

Mr. E. B. Gage, president of the Tombstone Consolidated Mines Company, of Tombstone, Ariz., has been visiting San Francisco, Cal.

Mr. J. W. Schramm, of Elgin, Colo., has been visiting in Gilpin County, Colo., where he is interested in the Ingalls and Mingo properties.

Mr. George G. Blackwell, of George G. Blackwell Sons & Co., of Liverpool, Eng., has been in Toronto, Ottawa and other Canadian cities.

Mr. George H. Hancock, superintendent of the White Knob Copper Company's Mackay, Idaho, mines, has been visiting in Salt Lake, Utah.

Mr. E. L. White, president of the Bingham Consolidated Company, accompanied by Treasurer O. E. Weller, has been in Salt Lake, Utah.

Mr. Don H. Bacon, of New York City, president of the Tennessee Coal, Iron and Railroad Company, is visiting the Birmingham, Ala., District.

Mr. W. B. Mosman, secretary and treasurer of the Centennial Copper Mining Company, recently inspected mines in the Lake Superior copper district.

Dr. R. Ogden Doremus, of the College of the City of New York, recently resigned from the presidency of the Greater American Mining Company, of New York.

Mr. L. W. Beard, of Decorah, Ia., has been at Lake City., Colo., looking over the holdings of the Hanna Gold Mining Company, in which he is a stockholder.

Mr. Joseph E. Gay, president of the Atlantic Mining Company, recently visited the Lake Superior copper district, inspecting the mines in which he is interested.

Mr. J. J. New, of Watseka, Ill., has been at Turret and Salida, Colo., on business connected with the Twin City Development Company, of which he is president.

Mr. Russell Doubleday, of New York City, recently visited the property of the Twentieth Century Mining Company, in which he is a stockholder, near Fort William, Ont.

Mr. F. W. Bradley, consulting engineer of the Bunker Hill & Sullivan Company, of Idaho, recently visited Benton, Gold Bug and other gold claims near Glendale, Ore.

Mr. M. D. Murray, manager of the Sierra Blanca Mining and Reduction Company, will take a much-needed rest for a few months during the winter somewhere on the coast.

Mr. H. W. Turner, who recently resigned from the United States Geological Survey, has taken charge of the Cherry Hill group of gold mines in Siskiyou County, Cal., as manager.

Mr. E. W. Sebben, of Denver, Colo., has been examining mining properties for the Dexter Mining and Development Company, of Rochester, N. Y., in the Atlantic District, Wyo.

Mr. W. A. Thacher, of Oil City, Pa., and Messrs. N. T. Clark and John B. Fritz, of New York City, passed through Salt Lake last week on their way East frim the Oregon gold fields.

Mr. Sol Haas, formerly president of the Sloss-Sheffield Steel and Iron Company, has returned to Birmingham, Ala., after a 2 years' trip through the West, much improved in health.

Mr. E. Packard, of New York City, president of the Empire State-Idaho Coounty Mining Company, has been visiting mines in the Coeur d'Alene country, Idaho, and in Trinity County, Cal.

Mr. E. L. Newhouse, of the American Smelting and Refining Company, recently visited the Granby Consolidated Mining, Smelting and Power Company's smelting works at Grand Forks, B. C.

Mr. James F. Wardner, better known as Jim Wardner, was in Rossland, B. C., recently. Mr. Wardner is now connected with the development of the new town of Mornsey, in the East Kootenay coal-fields.

Mr. Richard Trevarthen, formerly superintendent of the Portland Mining Company at Victor, Colo., has been examining properties in Gilpin County, Colo., and expects to make a favorable report for Eastern parties.

Mr. E. H. Benson, superintendent of the Black Warrior Copper Company, Amalgamated, recently returned to the company's mines and works near Globe, Ariz., after spending the summer at North Weymouth, Mass.

Mr. T. F. Neeley is to have charge at the American Nettie Mine, Ouray, Colo., succeeding Mr. R. G. Hall, who goes to Paradox, Colo., to manage the copper mine and smelter, in which he is interested with Mr. W. C. Laughlin.

Mr. Byron C. Riblet has returned to Nelson, B. C., from Encampment, Wyo., where for 8 months he had charge of the construction of the great aerial tramway connecting the Ferris-Haggerty Mine with the smelter at Grand Encampment.

Senator Pettigrew, of South Dakota, president of the California King Gold Mines Company, recently visited the company's property at Picacho, San Diego County, Cal. He was accompanied by United States Senator Butler, of North Carolina.

Mr. W. E. Thorne has tendered his resignation as manager of the Gold Bug Mining Company, of Oregon, and will accept a position with a large placer mining company on Forty Mile River, Alaska. His resignation is effective January 1, 1903.

Mr. M. A. Myers, of the Interstate Consolidated Mining Company, accompanied by Capt. C. P. Russell, of Cincinnati, O., and Mr. Mark Kirsch, of Kane, Pa., has been visiting the silver mines of Thunder Bay and the gold mines in Rainy River District, Ont.

Mr. J. W. Mercer, general manager of the South American Development Company, operating at Za-

ruma, 60 miles from Guayaquil, Ecuador, is stopping at Salt Lake, Utah. Mr. Mercer was connected with the Liberty Bell Gold Mining Company, Telluride, Colo.

Mr. M. S. Fallis, who has for several years been the constructing engineer for the American Smelting and Refining Company at Aguascalientes, Mex., has accepted a position as constructing engineer for the Metal Volatilization Company that will have its operating office in Denver, Colo.

Mr. James Ross, president of the Dominion Iron and Steel Company; Mr. R. R. Angus, a director of the same company, and Senator Forget, president of the Montreal Street Railway Company, recently visited the larger mines at Rossland, B. C., and afterwards looked through the Canadian Smelting Works, at Trail.

Mr. William Thompson, managing director and consulting engineer for the Slough Creek Limited, near Barkerville, B. C., recently returned to London, Eng. Mr. Thompson spent 3 months directing affairs at Slough Creek and at the Cariboo Gold Fields Mine and the properties of the Cariboo Consolidated, he being consulting engineer for the last named companies.

Mr. Roderick F. Tolmie, of Victoria, B. C., but formerly of Nelson, is stated to have been appointed Deputy Minister of Mines for British Columbia. Heretofore the duties Mr. Tolmie assumes have been carried out by Capt. Mallcott Richardson, secretary to the Department of Mines. Mr. Tolmie was for several years secretary to the Mine Owners' Association of British Columbia.

Mr. C. H. Repath has resigned as chief engineer of reduction works of the Washoe Copper Mining Company, at Anaconda, Mont., his resignation to take place on November 15. Mr. Repath expects to join Mr. F. Klepetko in New York City and be associated with him in his work as consulting engineer for the Cerro de Pasco mines in Peru, besides doing a general business in designing and constructing plants for mining and reducing copper ores.

Dr. Reginald A. Daly, formerly instructor in geographic geology in Harvard University, and now geologist of the Canadian commission co-operating with the United States commission in locating the International Boundary, has returned to Ottawa, after spending the season in the field under Mr. W. F. O'Hara. This season Dr. Daly's field work has been along the Boundary line east from the Okanagan River through the Boundary and West Kootenay districts of British Columbia.

Messrs. R. G. McConnell and Joseph Keele, of the Canadian Geological Survey, have returned to Ottawa, Ont., where they will spend the winter in work connected with the elaboration of their observations during their season's field work on the Canadian Yukon. Mr. McConnell spent the seasons of 1900 and 1901 in the Yukon. Mr. Keele was engaged part of the time in 1901 on an investigation of the copper deposits of the White Horse District, west of the White Horse rapids on the Lewes River. The season just closing has been devoted largely to making a complete survey of the McMillan River, a tributary of the Pelly, and the district tributary to it.

OBITUARY.

Thomas B. Jones, secretary-treasurer and general manager of the Standard Machine Company, of Saginaw, died recently at Bay City, Mich., of a complication of diseases.

Dr. A. R. C. Selwyn, formerly director of the Canadian Geological Survey, died at his home in Vancouver, B. C., on October 19, aged 78 years. He was born in England, and was appointed an assistant on the Geological Survey of Great Britain, while still a youth. In 1852 he was appointed director of the Geological Survey of Victoria, and remained in Australia 17 years. He was director of the Canadian Survey from 1869 to 1895. Mr. Selwyn was a member of many scientific societies and a geologist of wide reputation. An extended notice of his life will appear in a succeeding number of this paper.

SOCIETIES AND TECHNICAL SCHOOLS.

PRINCETON UNIVERSITY.—Woodrow Wilson was installed as president on October 25.

UNIVERSITY OF ILLINOIS.—The registration shows a total of 1,884 students in the various schools and colleges of the University at Urbana.

A. VAN DER NAILLEN SCHOOL OF PRACTICAL ENGINEERING.—This school at San Francisco, Cal., offers instruction in surveying, civil and mining engineering, assaying and chemistry and including mill tests by amalgamation, cyanide or chlorination and also courses in hydraulics and electrical engineering. The school was established in Chicago, Ill., but removed to San Francisco in 1874.

CORNELL UNIVERSITY.—The trustees are to purchase 16 acres of land to the west of the library tower and erect 6 new buildings, with more to follow. The complete development of the plan will require an expenditure of several million dollars. The trustees decided to locate the Rockefeller Hall of Physics west of Lincoln Hall, in accordance with the new plan which the trustees adopted. For the erection of a Hall of the Arts and Humanities $250,000 was voted.

MICHIGAN ENGINEERING SOCIETY.—At the recent annual meeting of the board of directors the following persons were elected officers: President, Prof. M. E. Cooley, Ann Arbor; vice-president, A. L. Holmes, Grand Rapids; secretary-treasurer, F. Hodgman, Climax; directors, A. C. Lane, Lansing; J. B. Davis, Ann Arbor, Daw Skeeles, Grand Rapids. The society was organized in 1880 and now has 126 members, including most of the prominent civil engineers and surveyors of Michigan. The next annual convention will be held at Battle Creek, January 20, 21 and 22, 1903.

CALIFORNIA MINER'S ASSOCIATION.—The annual convention will be held in San Francisco, on November 17. The association is composed of branch associations organized in the different mining counties of the State. The usual representation at the annual convention has been 1 delegate for each 10 members of a county association. This year, however, every member of all the county branches will be invited to attend. Hydraulic mining having been resumed under a law obtained through the agency of the Association and appropriations for debris barriers having been secured, the association must take up new work. This is the special matter to come before it. The association has about 9,000 members in good standing, embracing working miners, mine owners, superintendents, mining engineers, etc. Many merchants and machinery builders are also members.

ENGINEERS' CLUB OF PHILADELPHIA.—At the meetig on October 4 there were 76 members and visitors present.

Mr. Carl Hering made a few remarks, with blackboard ilustrations, on "The Latest and Best Value of the Mechanical Equivalent of Heat," and on "Recent Progres in Single Phase Traction."

Mr. Washington Devereux presented a paper upon "Some Electrical Fire Hazards," in which he examined some of the causes that may create a fire from electricity, and pointed out how they can be prevented by a careful observance of the rules which have been compiled and published by 9 of the national societies under the title of the "National Electric Code." The paper was illustrated by a large series of photographic views, showing partial or complete destruction of electrical apparatus and its surroundings by fire from the electric current improperly conducted. The subject was discussed by Messrs. Joseph D. Israel, Carl Hering, Francis Head, David Halstead and others.

INDUSTRIAL NOTES.

The National Tube Company is stated to have taken a large South African contract for pipe.

The American Air Compressor Works, of New York City, has in hand some Russian and Spanish orders.

The machinery for the Oil Well Supply Company shops is being removed from Oil City to the new plant at Siverly, Pa.

The Petroleum Iron Works Company, of Washington, Pa., lately took orders for several tanks for shipment to London.

The Wheeler Condenser and Engineering Company, of New York City, is about to make some heavy shipments to England.

The Union Steam Pump Company, of Battle Creek, Mich., has secured an order for pumps for shipment to South America.

The American Gas Furnace Company, of New York City, is about to make substantial shipments of its specialties to London.

The Lidgerwood Manufacturing Company, of New York City, recently secured a fair-sized contract for hoisting machinery to go to South Africa.

The Cincinnati Machine Tool Company, of Cincinnati, O., has orders on hand from England, France, Belgium, Switzerland, Italy, China and Cuba.

The Christy Box-Car Loader Company, of Des Moines, Ia., reports that 8 loaders have been shipped out within the past 4 weeks, and 5 more are in course of construction.

The Lunkenheimer Company formally opened its new works at Fairmount, O., on October 25. A large number of invited guests were present and the occasion was very enjoyable.

The Pacific Acetylene Gas Company, of San Francisco, has installed a 75-light capacity plant in the extensive headquarters of the McGowen Commercial Company, at Plains, Mont.

The A. Leschen & Sons' Rope Company, of St. Louis, Mo., is stated to have some substantial contracts on hand for aerial wire rope tramways, etc., to be installed in Mexican mines.

Adam Cook's Sons, of New York City, makers of Albany grease, report receiving many testimonials to the excellence of this lubricant for all kinds of machinery, heavy or light, slow or fast running.

A. J. McCune and associates have purchased the Nevada Foundry and Machine Shops at Reno, Nev., from John Michels, and will increase the size and capacity of the plant. A boiler shop will be one of the additions.

The Allegheny Ore and Iron Company, of Clifton Forge, Va., recently secured control of the Victoria Coal and Coke Company, whose mines and works are at Cooperston, W. Va. About 150 coke ovens will be erected and a number of improvements made.

Owing to the rapidly increasing demand for its machines on railroads, the Kennicott Water Softener Company, of 3,569 Butler Street, Chicago, Ill., has started a railroad department, which is under the personal supervision of William R. Toppan.

The Ingersoll-Sargeant Drill Company may remove its plant from Easton, Pa., just across the Delaware River to Phillipsburg, N. J. The company employs 1,500 men, and has been located at Easton for the last 8 years, having moved there from New York. The cause of the removal from Easton is the floods of the last 2 years, which interfered with the work of the concern.

The Otis Elevator Company has recently received the contract for the elevator and dumb-waiter equipment of the new Astor Hotel, Long Acre Square, New York City. The plant consists of 7 electric passenger elevators, 2 electric servants' elevators, 11 electric dumb waiters, and 3 electric side wall lifts. Messrs. Clinton & Russell are the architects and John Downey the general contractor.

Among recent sales of the New Century drop motion jigs, made by the American Concentrator Company of Joplin, Mo., have been those to the Daly-Judge Mining Company, Park City, Utah; Mining Machinery and Supply Company, Salt Lake City; Butte Reduction Works, Butte, Mont.; Seminole Mining Company, Metasville, Ga. They have also had a second order from the High Falls Pyrites Company, Canton, N. Y.

The Oil Well Supply Company, of Pittsburg, Pa., has recently taken some large orders for the general equipment of refineries and pipe lines in the Dutch East Indies. The machinery will include boilers, storage tanks, bleachery tanks, etc. Contracts have also been received lately through Hamburg and London sources for water well supplies to go to Cape Town, South Africa. Equipments for drilling water in Cuba are also about to go forward.

The Chicago Pneumatic Tool Company, of Chicago, Ill., reports recent large sales of pneumatic tools to the Newport News Shipbuilding and Engineering Company, Newport News, Va.; American Bridge Company, Philadelphia, Pa.; United States Navy Yard, Norfolk, Va.; Department Public Works, Sorel, Canada; New York Shipbuilding Company, Camden, N. J.; Pressed Steel Car Company, Allegheny, Pa., and several other concerns, all of the sales being made as the result of competitive tests.

Recent important contracts awarded the Air Compressor Department of the Chicago Pneumatic Tool Company, include 5 gross compound compressors of 600 ft. capacity each, for the Baltimore & Ohio Railroad; 2 compressors of 2,000 ft. capacity each for the Pressed Steel Car Company; 2,000 ft. compressor for the Kawasaki Dockyard, Japan; 2 600 ft. compressors for the New York, Ontario & Western Railroad, and 1 700 ft. compressor for the signal department of the New York Central & Hudson River Railroad.

The Robins Conveying Belt Company has been awarded one of the largest orders for coal and ashes handling machinery ever placed in New York City. It was placed by the Interborough Rapid Transit Company, which succeeds the Rapid Transit Subway Construction Company in equipping the New York Subway. The apparatus will handle all of the coal and ashes used in the great power station. There is to be a movable coal hoisting tower on the pier with belt conveyors running to the power house. There will also be elevating and distributing conveyors to the coal bunkers and an ash tramway running under the boiler room and to the pier coal tower, etc. The cars on this are to be handled by electric locomotives. A 1,000-ton ash pocket will also be constructed on the pier.

The annual meeting of the stockholders of the American Window Glass Company was held in Pittsburg, October 21. President Chambers' report shows that from September 1, 1901, to August 31, 1902, the receipts from the sales of window glass and all other sources were $874,664. There was charged off for depreciation $126,962, leaving a net profit of $747,702. The following directors were re-elected: Thos. Wightman, M. K. McMullin, T. H. Given, William L. Elkin, Philadelphia; P. A. B. Widener, Philadelphia; William Loeffler, J. A. Chambers, W. G. McCandless, N. T. DePauw, New Albany, Ind.; T. F. Hart, Muncie, Ind.; H. B. Smith, Philadelphia; S. T.

Bodine, Philadelphia; E. I. Phillips, Simon Burns, A. C. Howard and W. J. Carson. The directors will re-elect the present officers.

It is announced from Denver that the Western Executive Committee of the American Smelting and Refining Company will be abolished, and that hereafter the interests of the company in Colorado will be looked after by James B. Grant and Dennis Sheedy, of Denver, who are characterized as Western, or resident, members of the Executive Committee. Hereafter, the Eastern Executive Committee, which was the main governing body, will be known simply as the Executive Committee. Franklin Guiterman will be General Manager of the Colorado plants. Edgar L. Newhouse, ex-manager, with headquarters in Denver, will go to New York as assistant to the Executive Committee. The Executive Committee will consist of Daniel Guggenheim, Chairman; Isaac Guggenheim, Morris Guggenheim, E. W. Nash, Barton Sewell, Anton Eilers, August R. Meyer, James B. Grant and Dennis Sheedy.

TRADE CATALOGUES.

Pneumatic hoists and trolleys and portable winches are described in the 12-page pamphlet issued by the Chicago Pneumatic Tool Company, of Chicago, Ill. The pamphlet contains tables giving speeds of hoisting for given loads, with air pressure of 50 lbs., these data being obtained from actual tests.

The Fort Wayne Electric Works, of Fort Wayne, Ind., continues to issue its folders and circulars, describing wood electrical instruments and machines. Instruction book No. 3011 describes the company's electric measuring instruments, and folder No. 4038 tells about Wood type A oil transformers.

Superior gasoline motors for marine use are described in a new edition of the pamphlet published by the Lake Shore Engine Works of Marquette, Mich. These engines are made with 1, 2, 3 or 4 cylinders, and range from ½ h.p. up. The Lake Shore Works also build gasoline pumping engines and blowing engines.

No. 37 of the *Record of Recent Construction*, published by the Baldwin Locomotive Works, of Philadelphia, Pa., tells about fuel oil for locomotives, its efficiency and value as compared with coal, shows accepted methods of burning oil and gives illustrations of some oil-burning locomotives built by the Baldwin works.

The A. Wyckoff & Son Company, of Elmira, N. Y., is sending out circulars and other printed matter calling attention to the merits of Wyckoff's waterproof steam pipe covering for protecting steam lines, either above or below ground, to the superior quality of the company's patent wood pipe, and give numerous testimonials from users.

An illustrated pamphlet of 58 pages, published by the Kilbourne & Jacobs Manufacturing Company, of Columbus, O., describes that company's light, narrow gauge railroad cars and cars for use on sugar-cane and other plantations. The catalogue is printed in English and Spanish, and dimensions are given in both English and metric systems.

The firm of George G. Blackwell's Sons & Co., of Liverpool, Eng., manufacturers of special iron, copper and manganese alloys for the use of steel works, foundries, etc., sends out numerous circulars and pamphlets, describing its wares. One of these gives considerable information about the growth of the company's business, and tells about the numerous lines of manufacture in which the firm is interested.

The Comptometer, an adding and calculating machine with keys like a typewriter, is described in a pamphlet published by the manufacturer, the Felt & Parrant Manufacturing Company, of Chicago, Ill. This machine is adapted to all classes of commercial accounting, engineering calculations and scientific computation. The pamphlet gives a long list of testimonials and names of users.

A little pamphlet of unique design issued by the Wisconsin Graphite Company, of Pittsburg, Pa., calls attention to the value of Wisconsin flake graphite as a lubricant. Another little pamphlet entitled "A Life Preserver," points out the merits of the company's graphite paints for protecting structural iron and steel work. The company's mines are at Junction City, Wis., and its works at Junction City and Stevens Point, Wis.

The Deming-Berry Pulley Company, successor to the Tacoma Automatic Scales Company, of Tacoma, Wash., issues a 24-page pamphlet describing the wood split pulleys it manufactures. These pulleys are constructed of fir and spruce, are light on the shafts and being split are easily handled and adjusted. They have patented safety collars. The manufacturer guarantees them to work without slipping even under the most severe duties.

A little circular on sizing and classifying pulp, issued by the Dimick Concentrating Company, of Denver, Colo., for which the Mine and Smelter Supply Company is sole agent, states that the Dimick classifier is automatic throughout, has no moving or wearing parts, is economical to install, requires no additional water, removes all surplus water, has no moving or wearing parts, and greatly increases the saving of a concentrating mill.

Catalogue No. 17, issued by the Allis-Chalmers Company, of Chicago, Ill., describes that company's standard and automatic mining cars, and ore and water skips and buckets. The company's cars may be had with loose wheels on fixed axles, or with a number of arrangements of wheels on revolving axles with wheels either tight or loose, or with one wheel tight and the other loose. The company recommends, however, the Anaconda wheel and axle.

Bulletin No. 1, issued by the De Laval Steam Turbine Company, of New York City, contains detailed results of a thorough test made by Dean & Main, mechanical engineers of Boston, Mass., on a 300-brake h.p. De Laval turbine. The Curtiss-Crippen Engineering Company, with offices in New York, Chicago and Denver, is selling agent for the De Laval turbine, and states that this motor is now being made for direct connection to electric generators, blowers and pumps.

Wheels for carts, wagons, trucks and heavy gears are described in an attractive 48-page pamphlet published by the Electric Wheel Company, of Quincy, Ill. The wheels are made of steel, have tires of any desired width, and are especially desirable for use on sandy or soft roads. They are used on freight trucks, logging gears, well drills, portable engines, ore wagons, etc., and are recommended for use in tropical climates. The company also makes the Electric handy wagon for general purposes, and the Best log wagon.

A useful little booklet is being distributed with the compliments of the "Eagle Pass Route," Southern Pacific, Mexican International Railroad. It contains valuable information for tourists, and is entitled "What One May Bring Out of Mexico Without Paying Duty." The treatise which is complete as to details, has the laws interpreted by Leslie M. Shaw, Secretary of the Treasury. Any one desiring a copy of this booklet can obtain it on request to the offices of the Southern Pacific Company.

Motor hoists, stationary motors, drills, hammers and riveters using compressed air as power are described in an illustrated pamphlet of 24 pages, published by the Port Huron Air Tool Company, of Port Huron, Mich. The company's motor hoists are built in 6 sizes, having a range from 1 to 10 tons capacity. They are stated to work very smoothly, hoisting and lowering without perceptible jar and sustaining the load with absolute safety. The company's hammers and riveters are described as made of the best material and of very simple construction.

The Kelley patent improved Berryman water tube feed water heater and purifier is manufactured by Benjamin F. Kelley & Son, of New York City. This device has a shell of cast iron or steel that is not subject to the boiler pressure. The tubes are of seamless drawn brass, expanded directly into the crown of the steam jacketed base, which entirely surrounds the settling chamber. The company says that this heater and purifier cannot leak under the highest boiler pressure that can be carried. It and the Economical belt-driven boiler feed pumps are described in a pamphlet published by the company.

The Massachusetts Fan Company, of Waltham, Mass., which manufacture sheating, ventilating and drying apparatus for mills and factories, dry kiln fixtures, steel plate blower fans, electric fans and disk fans, issues a variety of pamphlets and circulars calling attention to its products. The company's Davidson propeller fan is claimed to have many points of superiority over other fans. It is stated to be noiseless, to give uniform delivery and to handle steam laden air without dripping. The Sterling disk fan has 12 blades attached to a large central disk, the blades overlapping one another, thus preventing back-lash. Both the Davidson and Sterling fans may be driven by belt or by direct connection to electric motors.

The Christensen Engineering Company, of Milwaukee, Wis., is issuing some very handsome catalogues. One of these, a pamphlet of 52 pages, describes the Christensen air brakes for use on electrical railways, and contains views of the company's air-brake shops and a long list of electrical railway companies using the brakes. Another pamphlet, containing 54 pages, describes the company's "Ceco" electrical machinery, including direct-current motors and generators, and alternating-current generators and transformers. The descriptions are clear and concise and the half-tone cuts of unusual excellence. Still another catalogue, a pamphlet of 58 pages, describes the company's straight air-brake equipments with independent power compressors for use on electric cars.

A 78-page catalogue containing some fine illustrations is issued by the Baldwin Locomotive Works and the Westinghouse Electric and Manufacturing Company. It is entitled "Electric Locomotives for Surface Haulage," and describes the mechanical and electric details of the locomotives now being put on the market by the two companies. It contains tables, giving information for the selection of a locomotive for any particular service, including narrow or standard gauge mining locomotives for use about mines and smelters and locomotives of special design for light or heavy work about industrial plants. The cuts show locomotives furnished for the Tennessee Copper Company, of Ducktown, Tenn.; the White Knob Copper Company, of Mackay, Idaho, and the Penoles Mining Company, of Mapimi, Mex.

Catalogue No. 34, issued by the F. M. Davis Iron Works, of Denver, Colo., describes the Davis crushing rolls, and points out their merits. The bearings of the adjustable rolls are carried by swinging arms, avoiding the excessive wear of the usual sliding bearings. Each arm is held in position by a spring bar, secured by a nut screwed up against the washer carrying the springs; these springs are stiff enough to do the regular work for which the machine is intended without compression, and yield only under abnormal strains. Longitudinal adjustments for wear are provided for by removing steel and brass washers between the roll box and a collar locked on the end of each roll shaft. The shells are of open-hearth steel, hard and tough, forged and rolled to shape and carefully turned inside and out. The company manufactures sampling rolls, crushing rolls and high-speed rolls. The smaller sizes of the standard and high-speed rolls can be had sectionalized to 350 lbs. for mule-back transportation. The pamphlet contains scale drawings of different styles of rolls, and gives directions for installing.

Catalogue V., sent out by the H. W. Johns-Manville Company, of New York City, is a neat little pamphlet of 30 pages, which points out the advantages of using the best grade of steam packing. It also states that Vulcabeston packing is composed of asbestos, combined with vulcanizable gums making a tough, pliable and yielding material that can be molded into any shape, gasket or packing. It will not shrink or expand, and is impervious to the action of acids, gases, alkalies and ammonia, and can be had of any desired density. The specialties manufactured by the company from this material include sheet packing, piston-rod packing, pressed rope rings and gaskets, molded gaskets, union washers, valves for pumps and blowing engines, and shaped packing rings for valve stems or piston-rods. The company calls especial attention to its Vulcabeston C & C rings for use on air brake pumps of locomotives, and states that they have been adopted by the Westinghouse Air-brake Company as standard. The pamphlet contains some testimonials of interest and a partial list of railroads using Vulcabeston packings. The company will be glad to mail a copy of the pamphlet to any applicant.

The Pelton Water Wheel Company, of New York and San Francisco, has issued a new and elaborate catalogue describing the Pelton waterwheel, which embraces in its variations of construction and application, the Pelton system of power. The company states that rapid improvement in machine design and construction particularly as regard electrical apparatus has demanded a corresponding betterment in waterwheel construction. This has brought forth many new and special designs of Pelton machinery, which are illustrated in the new catalogue. One of the advantages claimed for the Pelton system is its adaptability to widely different conditions of water supply, since by changing the nozzle-tip of a wheel the power produced may be reduced from maximum down to about 25 per cent of same. Speed regulation is accomplished by a reflecting nozzle or by a cut-off hood, the nozzle or hood being actuated by an automatic governor. To handle large quantities of water under moderately low heads the company has designed its quintex nozzle wheel, having a nozzle with 5 rectangular openings. The catalogue is as handsome as it is useful. It contains some colored illustrations and also numerous tables for the use of those contemplating the development of water power.

GENERAL MINING NEWS.

ARIZONA.

GRAHAM COUNTY.

(From Our Special Correspondent.)

Standard Copper Company.—The Arizona Copper Company's smelter at Clifton is reported to have a 3-year contract to treat this company's ores.

MOHAVE COUNTY.

(From Our Special Correspondent.)

Enterprise Mining Company.—This company has a number of men at work on its group of gold claims at Wallapai Springs.

Homestake.—Thomas Thornton has struck ore carrying gold, silver and copper in this mine at Chloride.

G. A. R.—Link McKesson is taking high grade silver ore out of this mine at White Hills, which belongs to the White Hills Company.

Lucky Boy.—Work is going on in this mine on Combat Mountain at the 400 and 500-ft. levels. On the 400-ft. a number of men are stoping rich ore.

Nighthawk.—At this mine in Todd Basin, L. S. Smith, superintendent, laid off all the men temporarily on account of escaping gas from the gasoline tanks and

engine getting in the underground workings. A steam hoist will be put in.

Paymaster.—This mine, at Mineral Park, has 2 carloads of ore to ship.

Woodchopper's Relief.—This mine at Mineral Park, is working a much larger force than heretofore.

Tennessee.—The best body of ore yet found in this mine at Chloride is reported on the 500-ft. level.

CALIFORNIA.

AMADOR COUNTY.

(*From Our Special Correspondent.*)

Horn.—The shaft and tunnel of this mine at Defender, George Horn superintendent, have been connected. The vein exposed is free milling and 7 ft. wide.

South Eureka Mining Company.—This mine at Sutter Creek, John Truscott superintendent, is to prospect below the 2,000-ft. level in hopes of finding pay ore. Sinking is in progress.

BUTTE COUNTY.

(*From Our Special Correspondent.*)

Blue Lead Gold Mine.—Efforts are being made to bond this gravel property near Bangor. Holders of stock are being looked up by A. M. Smith, of Oroville, and W. C. Weirick, of Canton, O.

CALAVERAS COUNTY.

(*From Our Special Correspondent.*)

Afterthought Group.—Work is to be resumed on these properties at Railroad Flat, with C. M. Burleson as manager and W. W. Cook as superintendent.

Beatrice-Robles.—At this tunnel at Murphys, a body of quartz is reported cut.

Fannie Marie Mining Company.—This company, F. Courtmarsh manager, owns the Blue Jay Mine near Mokelumne Hill, is making 180 ft. a month on the tunnel, and expects to tap the vein about February.

Gwin Mine Development Company.—This company, F. F. Thomas superintendent, has been given permission by the Supervisors to run a steam wagon for hauling lumber from Valley Spring to the mine at Gwinmine. The road is very bad in winter, and supplies are being hauled in as fast as possible.

Last Chance.—This mine at Angels, Walter Tryon superintendent, has received a hoist, boiler, air compressor and other machinery.

Middle Fork Ditch.—The survey of this ditch to Beach Thompson's gravel mine near Murphy's is completed, and work is to begin shortly on the mine.

Oriole Mining Company.—For this mine at Angels, F. E. Dunlap, of Stockton, manager, a 10-stamp mill is being built at the Angels Iron Works. The new plant is to be run by electric power.

HUMBOLDT COUNTY.

(*From Our Special Correspondent.*)

Orleans Bar Gold Mining Company.—This company at Orleans, H. De C. Richards general manager and Fred T. Hale superintendent, has this season, with 2 giants, washed 20 acres of ground to a depth of 48 ft., realizing 12c. per cu. yd.

INYO COUNTY.

(*From Our Special Correspondent.*)

Inyo Gold Company.—This company, which owns the Tuber Mine at Ballarat, is installing a 50-ton cyanide plant to work the tailings and also ore from the mine. J. P. Flint is president.

Reward Gold Mining Company.—Twenty-five men are grading a millsite for this mine at Reward. Superintendent H. C. Steele has a small force working in the mine.

KERN COUNTY.

(*From Our Special Correspondent.*)

Oil Prices.—For some time the price of oil in the Kern River field has been 11c. per bbl., but a local paper now reports an offer of 15c. for 200,000 bbls. as not yet accepted, while an offer of 14c. for 500,000 bbls. goes begging.

Peerless Oil Company.—The wells of this company in the Kern River field, produced for the year ending September 30, 711,168 bbls. of oil, of which 24,612 bbls. were used at the wells and 686,556 bbls. were sold for a gross price of $137,887. On October 12 the 44 wells were producing 3,028 bbls. daily.

MADERA COUNTY.

(*From Our Special Correspondent.*)

River Mining.—In the bend of the San Joaquin River, between Millerton and Gold, a dam has been built, and with low water this season the river bed miners have been successful, reaching gravel, which had been inaccessible.

MARIPOSA COUNTY.

(*From Our Special Correspondent.*)

McAlpine.—Superintendent Rigg has another shift at work on this mine at Coulterville. A steam hoist will be put in shortly.

Monitor Group.—Work on a 400-ft. tunnel is to start.

Penon Blanco.—One of the tunnels on this mine, owned by A. H. Ward, is in 200 ft., and another about the same distance. The mine is at Coulterville.

Turner.—This mine, near Mount Bullion, is operated by J. F. Hutchinson, E. Hart and H. L. Wilson. The vein is 2 ft. wide and mills about $30 per ton.

MONO COUNTY.

(*From Our Special Correspondent.*)

Golden Gate.—The recent bonding of this mine near Coleville by Wedekind & Blackburn has renewed attention to the locality. Some of the ore in the mine assays quite high. J. Blackburn, of Bridgeport, will be manager. J. L. Wedekind lives at Reno, Nev. Extensive developments have not yet begun.

MONTEREY COUNTY.

(*From Our Special Correspondent.*)

Stone Canyon Coal Company.—This company is now down 410 ft. Two traction engines haul the coal to Bradley station, but the company proposes to build a branch road to the mines, or to tidewater.

NEVADA COUNTY.

(*From Our Special Correspondent.*)

Black Bear.—This mine, near Rough and Ready, is under bond to San Francisco men, who will shortly determine whether will take the property or not. The ledge is very wide.

Gold Blossom.—At this Glass Valley mine, owned by Richard E. Jeffrey, and under bond to a company of George F. Dyer, E. L. Campbell and others of San Francisco, the working force is larger. A new 2-compartment shaft will be sunk 300 ft. A 10-stamp mill is to be put up, and a hoist, pumps, compressor, etc.

New Hartery.—This property, formerly the Winfield Scott, near Grass Valley, is under bond to Eastern men. The mine adjoins the Allison Ranch and old Hartery.

PLACER COUNTY.

(*From Our Special Correspondent.*)

Alameda Gold Minng Company.—This company, near Westville, expects to have its new 20-stamp mill completed soon.

Boulder.—This mine at Ophir is being opened. G. F. Dyer is manager and E. E. Fowler superintendent.

Calf Pasture.—Dr. J. Manson and others have started work in this mine near Auburn. The shaft is being unwatered.

Crater.—Machinery has been delivered at this mine at Ophir, and work is to be resumed.

Eclipse.—At this mine at Ophir, 2 Johnston concentrators have been installed. The 10-stamp mill is now run by a 35-h.p. gasoline engine.

Old Crater.—The Eclipse Company is opening this mine at Ophir and putting up a hoist.

Washington.—In this mine, near Forest Hill, T. E. Dudley, superintendent, 15 men are busy and the mill is kept running.

SACRAMENTO COUNTY.

(*From Our Special Correspondent.*)

Twin Brothers Mining Company.—This company has been organized at Folsom with the following directors: P. C. Cohen, E. Burke, George Imhoff, G. A. Bauer, and J. W. Orr, of Folsom, and J. H. Batcher and W. T. Phipps, of Sacramento.

SAN BENITO COUNTY.

(*From Our Special Correspondent.*)

Stayton.—This quicksilver property, 10 miles from Hollister, has been idle some years, but is preparing to start work again, and material is being hauled in. Snyder H. Smith, of Gilroy, is secretary of the company.

SAN BERNARDINO COUNTY.

(*From Our Special Correspondent.*)

John R. Gentry.—These mines adjoining the Bagdad at Ludlow, have been acquired by L. E. Porter, superintendent of the Bagdad, and B. E. Chase, of Syracuse. Development will start at once. E. H. Stagg will be manager.

SAN DIEGO COUNTY.

(*From Our Special Correspondent.*)

Mesa Grande Mining Company vs. San Diego Tourmaline Company.—The application of plaintiff for an injunction has been denied and an order issued dissolving the temporary injunction.

Ranchita.—Cave Couts expects to start work shortly on this mine at Banner.

SAN LUIS OBISPO COUNTY.

(*From Our Special Correspondent.*)

Beach Sand Mines.—It is stated that Arroyo Grande parties are preparing to work ocean beach sands at Pismo by dredge. Water wil be secured from Pismo Creek.

California Coal and Iron Company.—This new company organized in San Jose, W. W. Jennings president, is driving a tunnel on the Murphy coal vein near Huasna.

Chorro Ranch.—H. B. Gleason, who is prospecting for gold on this ranch, has ordered a hoist.

SANTA BARBARA COUNTY.

(*From Our Special Correspondent.*)

Beach Sands.—W. S. McKay and others, of Lompoc, intend forming a company to develop beach sand at the mouth of the Santa Inez River by dredging.

SANTA CLARA COUNTY.

(*From Our Special Correspondent.*)

Guadalupe.—At this quicksilver mine, now being reopened under the supervision of H. C. Davy, by the Century Mining Company, very good ore is found. The mine has been closed many years. About 75 men are employed.

SHASTA COUNTY.

(*From Our Special Correspondent.*)

Detroit & California Mining Company.—This company, Theo. Heintz manager, is installing a large dredge on Clear Creek, near Horsetown. A scow has been built and the machinery is on the way from Pittsburg, Pa. Power will be furnished by the Northern California Electric Power Company. Horsetown is 17 miles from Anderson on the railroad.

Mount Shasta Oil Company.—This company began boring for oil on the sand flats east of Redding.

SIERRA COUNTY.

(*From Our Special Correspondent.*)

Corotoman.—For this mine, near Forest City, an electric pump is now being installed.

Mabel Mertz.—This mine, near Allegheny, is being reopened by a San Francisco company, with Hugh McCormick as superintendent.

New Enterprise.—At this mine, known as the old Grand Prize, near Downieville, J. H. Stewart superintendent, 8 men are cleaning out the trails and roads preparatory to erecting buildings, etc.

SISKIYOU COUNTY.

(*From Our Special Correspondent.*)

Cherry Hill.—Work has started at these mines near Yreka under new management, H. W. Turner having taken charge. The liens on the property have been liquidated.

Consolidated California Hydraulic Mining Company.—This company is operating at French Creek, near Calahans, on 500 acres of gold-bearing gravel. John O. Welsh is in charge. The ditches are being enlarged and a large reservoir will store water for summer operations. The company is composed mainly of Pittsburg, Pa., people.

Jumbo.—This mine on White's Gulch is to be worked this winter by H. J. Eldredge & Co., of Sawyers Bar.

Know Nothing.—This mine, near Forks of Salmon, has been bonded to Mr. Mitchell, who expects to open the property. The mine has been idle 2 years, but was formerly a producer.

Pine Grove.—This placer mine, near Oak Bar, M. J. Whitney, manager, is owned by a Detroit, Mich., company, and uses a hydraulic elevator.

Ray.—E. R. Ray has sold to E. C. Holmes, of San Francisco, 5 quartz mines near Carters.

SONOMA COUNTY.

(*From Our Special Correspondent.*)

J. M. Lawrence, of Minneapolis, is opening some coal near Petaluma on land belonigng to the William Hill Company and Mrs. Mott. A tramway will be built to tidewater, a little over 4 miles.

STANISLAUS COUNTY.

(*From Our Special Correspondent.*)

La Grange Ditch and Hydraulic Mining Company.—This company's water rights and ditches have been sold. The new owners will generate electric power, the placers being worked out.

TEHAMA COUNTY.

(*From Our Special Correspondent.*)

Basler.—A 600-ft. tunnel is to be run in this mine in the Coast Range, just off the Colyear springs road. Boilers and compressors are being hauled in.

TRINITY COUNTY.

(*From Our Special Correspondent.*)

Three Peaks.—A 10-stamp mill is being shipped to this mine on Coffee Creek. F. P. Primm is president of the company, and J. J. Chambers general manager.

TUOLUMNE COUNTY.

(*From Our Special Correspondent.*)

Cosmopolite.—At this mine, near Groveland, miners are making about 15 ft. a week on the cross-cut, and are nearing the vein. Dr. J. M. Merrill is operating the mine, with Harry Argall as superintendent.

Duleek.—At this mine, near Groveland, miners are running a 500-ft. cross-cut tunnel. The 10-stamp mill is ready to start.

Dutch.—Sinking in this mine at Quartz is resumed, and the shaft is to go 150 ft. below the 1,300 level. A. Trittenbach is president of the company.

Mary Ellen.—Charles A. Smith, of the Sunnyside Mine at Groveland, has bonded the Mary Ellen claim and started work on a 500-ft. tunnel.

Sierra Gold Mining Company.—The shaft at this mine near Groveland is being enlarged to 2 compartments. Boiler, hoist and pump have been ordered and a galows frame is being put up. John F. Giles, of Chicago, president of the company, is at the mine.

Temescal.—Frank McPherson, lessee, has started work at this mine near Confidence. The mine has been idle a year. The mill has 5 stamps.

YUBA COUNTY.

(*From Our Special Correspondent.*)

Yuba River Debris Dams.—Eight bids were received for the first of the series of debris dams on the Yuba River above Marysville, the lowest being from the Atlantic Gulf & Pacific Company for $27,940. This is the cheapest of the series of dams. The whole appropriation for the dams is $800,000, the United States Government and the State of California each contributing half.

COLORADO.

BOULDER COUNTY.

Rich float had been found in a potato patch near Wall Street for years. A Mr. Doty from New York looked over the ground last March and employed W. B. Teeters to prospect for the lead. The latter found and traced it for over a mile. It is a contact deposit on the Livingstone dike. The ore is brecciated porphyry and schist. The values are telluride of gold. Several shipments of high grade ore ran 80 oz. to the ton. The vein is 14 ft. wide. A little cyanide mill under lease is treating 30 tons daily of $30 to $40 ore. Public attention was aroused a short time ago when some men went to work in the potato patch and began to take up the soil over the lode with teams and scrapers and haul it to the cyanide mill. The newspapers thought it was a brand-new strike, but Doty has been working on it since March.

Black Swan.—This mill, below Salina, is treating sulphide ore from the Black Swan Mine and Eldorado tunnel, which carries some free gold. The mill is provided with stamps and rolls. The pulp passes over Barr amalgamators, thence to concentrating tables. W. H. Nicholson is superintendent.

Golden Eagle.—This mine, near Salina, belongs to the Creston Golden Eagle Mining Company, and is under the management of J. T. Fitzgerald. There are 2 tunnels, the lower, 1,100 ft. long, and the upper, 800 ft. A shaft 400 ft. deep has been sunk to connect with the tunnel, and a winze 140 ft. deep has been sunk below the lower tunnel. Besides tellurium, the ores carry some iron and zinc sulphides. A steam hoist is being put in.

Victoria.—This mine, belonging to the Victoria-Boulder Mining Company, of Boston, is under lease to Pickad & Mitchell, of Boulder, who are mining sulphide ore carrying gold and silver with some copper lead and zinc, and are shipping regularly.

CLEAR CREEK COUNTY.

(*From Our Special Correspondent.*)

Freeland Mining Company.—A new air compressor is being installed for sinking the shaft and drifting at the Extension Mine now owned by Dakota people.

Marshall-Russell Tunnel.—A steam plant is to be installed to take the place of water power, which has proved unsatisfactory during the low stages of Clear Creek. W. C. Marshall, Marshall Park, is manager. In cross-cutting at 1,000 ft. in the Marshall Tunnel 2 veins showing 14 ft. of mill ore running from $7 to $14 a ton were cut.

Poorman Mining Company.—A new 22-h.p. Fairbanks gasoline hoist has been put in the 700-ft. adit at Freeland to sink a winze. A fair-sized body of lead ore is exposed.

Seaton Mining Company.—In sinking the inside shaft and drifting at a depth of 900 ft., Manager F. S. Goldsmith reports opening a streak of ore running $65 a ton. It is claimed to be 4 ft. wide.

Shafter Mining Company.—Ore from this mine is now being treated by the Idaho Springs Reduction Mill.

Sun & Moon.—Manager H. N. Sims, of Idaho Springs, is starting an 8 by 20-ft. raise, 3 compartment, on the Minott from the Newhouse level. Three shifts with 3 air drills will be worked, and it is expected 14 ft. per day will be made. The distance to the 9th level of the Minott is 1,000 ft.

GILPIN COUNTY.

(*From Our Special Correspondent.*)

Mining Deeds and Transfers.—B. F. Jones to John E. Zahn et al., ½ interest in Santa Clara No. 1, Santa Clara No. 2, Pocatello, Idaho, Hall City and Golden Star lodes, Vermilion District; Thomas A. Irvin to V. Vallero et al. the Justice and Evelyn lodes, Lake and Russell Districts; David Lyons et al. to The Lyons; Kyle Mining Company, the Central lode, Quartz Valley District; O. T. Hazelburg et al. to I. T. Huff, the Chicago lode, Pine District.

Cumberland Mining and Milling Company.—Colorado Springs and Eastern parties are interested in the Cumberland group in Yankee District, and will soon sink the shaft, using Ingersoll drills. They intend to put up a 10 or 15-stamp mill next spring. A. C. Dickson, of Yankee, is in charge.

Kansas-Burroughs Consolidated Mining Company.—Arrangements are being made to sink the main or Phœnix-Borroughs shaft on Quartz Hill another lift of 100 ft., making it 1,400 ft. Leasers in the English-Kansas property have received returns of 13 oz. gold per ton for one lot of smelting ore, and their last lot went 7 oz. per ton. The milling ore cleans up fairly well on the plates, and their last tailings sold for $35 per ton. The outlook seems to point to heavier work. P. McCann, Central City, is superintendent.

Lower Treatment Charges.—The Carpenter Smelter at Golden has announced that it has taken off the silica penalty on all ores carrying values up to $15 per ton, ores of a higher grade to be charged as heretofore for excess silica. This means quite a reduction on the treatment of low-grade ores, and will result in increased shipments of the ores which have been principally treated at local stamp mills. The smelter is operated by the Clear Creek Mining and Reduction Company, with F. R. Carpenter, Equitable Building, Denver, as manager.

Lotus.—Sternberger Brothers, owners of this group, are erecting a shaft building, and will install machinery on the east end of the property. Fred Wood, Russell Gulch, is superintendent.

North Star.—This property in Vermilion District is being opened by the Ann Rutledge Gold Mining Company, with James McMillen, Central City, superintendent. A new shaft building has been erected, and a 12-h.p. gasoline engine installed. The shaft is 115 ft. deep, and in the 50 and 115 ft. levels a good body of ore is showing up, carrying values of from 1 to 6 oz. gold per ton. The company is shipping a 100-ton lot to Black Hawk for a test, and will sink much deeper this winter. Ohio and Denver parties are interested with A. B. Sanford, 1727 Champa Street, Denver, as secretary and general manager.

Pewabic.—This property in Russell District is being rapidly unwatered with 3 shifts hoisting at the Iron and Richardson shafts, while a sinking pump has been put in the West Pewabic shaft. The Iron shaft, down 600 ft., is the deepest. Work is carried on by Berry Brothers, of Detroit, Mich., who will make a thorough examination of lower workings as soon as the water is out. The group is well known as a past producer of pyritic ores, which are needed at the Golden Smelter. E. R. Nelson, Russell Gulch, is in charge.

Powers Mining and Milling Company.—This company has purchased the Powers, Hope and Cresceus lodes in Russell District. The stockholders are Colorado and Pennsylvania men. They have installed a 22-h.p. Fairbanks, Morse & Co. gasoline hoist, overhauled the buildings and built ore bins. Ore is now mined at the 220 level, where the vein is about 3 ft. wide and a shipment of 25 tons of second-class ore which will run between $20 and $30 per ton, has been made to the Argo Smelter. About 15 tons of first-class ore on hand carries values of better than $60 per ton. The company intends to carry on development this winter. Chris Paul, Nevadaville is superintendent.

Saratoga.—At this property operated by the Clear Creek Mining and Reduction Company a lift of 100 ft. has been completed in the cage shaft making it 1,000 ft. deep, and a cross-cut has been started. The average daily shipments to the Golden Smelter are 75 tons, and employment is given to over 100 men. The 800 and 900 levels have shown up better than any above, and much is expected of the ground in the new lift.

Shotburg.—Chicago parties operating as the Colorado Mining and Oil Company have acquired an interest in this property on Bobtail Hill. Work on a contract for sinking 100 ft. has started; it will make the shaft 180 ft. deep. The shaft shows ore carrying assay values of close to $150 per ton. The vein is 6 ft. wide, and shows some lead and copper. Ore bins are being built. Fred Totman, Central City, is in charge.

GUNNISON COUNTY.

Brunswick Company.—This company is making good progress on its 1,500-ft. tunnel into Gold Hill to cut the Jimmy Mack vein at great depth. The company has a 100-ton mill in Willow Creek Gulch, near the entrance of the new tunnel, which will handle the low grade ore.

Citizen.—This mine in the Pitkin District has opened a good ore in the new 100-ft. shaft.

Colorado Mines Consolidated Company.—This company has its new stamp mill on Cochetopa Creek in operation. The Sterling and Standard tunnel is in over 1,000 ft., and is showing 5 ft. of ore. Cripple Creek mining men are backing this proposition. The mill is treating about 10 tons of ore daily.

Maid of Athens.—This mine, adjoining the Citizen, recently opened a body of $50 ore in the east drift from the old tunnel, 125 ft. from the surface. The mine is shipping regularly.

Tilden Mining Company.—This company is pushing work on the Red Cloud tunnel on Tilden Mountain in the Tin Cup District. It is in over 500 ft. The vein in the old workings is 10 ft. wide and carries a streak of silver-lead ore.

West Gold Hill Mining Company.—This new enterprise, with a capital of $1,000,000, is preparing to do extensive work in the Tin Cup District. L. Cavanah and others are back of the company, and have Eastern men associated. The property is a group of claims on West Gold Hill, where considerable work has been done.

LAKE COUNTY—LEADVILLE.

(*From Our Special Correspondent.*)

Mining Outlook.—The feeling which attributed depression almost wholly to the smelting situation is yielding to a belief that aggressive prospecting for new mines is most needed, that high-grade mines are yet to be discovered that will help market more low-grade ore. Some of the operators who have led the way in great discoveries, it is believed, are preparing to demonstrate their faith in the hidden wealth yet to be found by thorough exploration of new territory.

Rialto Leasing Company.—Under Manager Mudd's direction drilling has disclosed large bodies of the iron sulphides found in the R. A. M., Greenback and Mahala ground adjacent to the former. The Rialto has also found a body of lead-zinc sulphides above the level from which drilling was done. Preparations are being made to sink the shaft which will probably have to be at least 1,500 ft. deep.

Yak Tunnel.—This tunnel, which is now approaching the Ibex properties at a depth of over 1,300 ft., is penetrating quartzite, believed to be Cambrian. Limestone is known to exist at greater depth in ground contiguous to the tunnel. This encourages mining men that the sedimentary formations, Iron, Carbonate and Fryer hills, extend under Breece Hill, but are covered by many hundreds of feet of porphyry. Already confidence in the extension of the old ore shoots, especially of Iron Hill into Breece Hill, is reviving. Some of the operators on Breece Hill are likely to sink to the sedimentary plane.

PUEBLO COUNTY.

(*From Our Special Correspondent.*)

The construction of the new zinc smelter at Pueblo is progressing. E. H. Hamilton is the superintendent and K. Suhlberg, of Belgium, is consulting engineer. Every effort wil be made to complete the plant as soon as possible. It promises to be an important addition to the industries of Pueblo.

SUMMIT COUNTY.

Vivandiere.—This Turret mine is to be re-equipped with a complete new plant of machinery, including a 50-h.p. hoist, a sinking and a station pump. J. J. New, of Chicago, Ill., is president of the company. Arrangements are being made to have the machinery shipped as soon as possible. Sufficient cable will be bought to sink the shaft to 1,200 ft. The values at present obtained are from the 500-ft. level.

TELLER COUNTY—CRIPPLE CREEK.

(*From Our Special Correspondent.*)

Drainage of Cripple Creek Mines.—The Special Committee on drainage consisting of Sherwood Aldrich, William Bainbridge, William Lenox, Frank G. Peck and F. F. Castello, held a meeting at Colorado Springs recently, and decided upon a definite plan of procedure, which was presented at a special meeting of all the Cripple Creek mining interests, at the offices of the Elkton Mining Company, at Colorado Springs, October 20. The committee believed a tunnel 10,000 ft. long will cut the water course 500 ft. below the present water level, permitting the larger mines on the higher hills to be worked to a depth of at least 2,000 ft., while the majority will be freed of water to a depth of 1,500 ft. It is estimated that such a tunnel can be driven for about $300,000, and that the work will require about 2 years.

At the meeting of the mine operators on October 20 a tunnel scheme was recommended by the committee, and accepted. No definite construction plan was determined, and a new committee was appointed, consisting of Sherwood Aldrich, F. F. Castello, William Lennox, F. G. Peck, S. S. Bernard, F. M. Woods, A. E. Carlton, F. J. Campell, D. V. Donaldson and John R. McKinnie. This committee will review the work already done, and, if necessary, with the advice of experts, formulate a financial plan and oversee the construction of the tunnel.

C. O. D.—In this mine, formerly a large producer, lessee Erbell is opening a vein 4 ft. wide on the 400-ft. level, and lessees on the 100-ft. level believe they have struck a large ore shoot.

Doctor Jack Pot.—Charles Leonard, who is working in the 7th level, is said to have opened up a body of good ore, from which he is shipping.

Elkton.—The co-operation of the great mining companies, with a view of settling the water question, has caused this company to cancel its order for large pumps, as the surface holdings are about 3,500 by 800

ft. There is enough work to be done above the 700-ft. level for years. The water reaches to the 7th level.

El Paso.—The new plant is nearly completed. Operations will probably begin soon in the new 3-compartment shaft. Flat cables 5 in. wide will be used in hoisting double-deck cages. The hoisting plant is similar to that on the Independence. Power will be furnished by 2 200-h.p. boilers. The mine is a good producer.

Findley.—The company working this property has cut good ore in the 11th level, and is said to be taking out enough to pay expenses. It is understood they will sink 200 ft. to 1,400 ft. A level was cut at 1,200 ft. and another will be cut 1,400 ft.

Hoosier.—This property on Tenderfoot Hill is worked by lessees, who expect to ship about 200 tons of ore in October.

Isabella.—This mine, on Bull Hill, is one of the very active properties in the district. No less than 11 sets of leasers are busy on the property, and 7 are producing ore. Between 600 and 700 tons were shipped during September.

Laura Lee.—Indications now are that this mine, situated on Mineral Hill, will before long be a large shipper. Richard Trevarthan has taken charge, and predicts a big future for this section of the gold belt. Operations have already started; a new plant of machinery will be installed, and the 100-ft. shaft sunk to 300 ft.

Mary Cashen.—Considerable ore is shipped and regular shipments are expected.

Mary McKinney.—Since this property quit pumping the water has risen to within about 20 ft. of the 5th level, where it remains stationary. The report that the mine is to be sold to an English company is denied. At present the output is said to be about 75 tons per day. The shoot has been explored for 2,000 ft., and shows very rich ore.

Modoc.—The old board of directors has been re-elected as follows: President, F. H. Falkenberg; vice-presidents, G. E. Bragdon and H. Herman; treasurer, W. Green; secretary, C. Harmsmeyer.

Pharmacist.—It is stated that a telegram received from Washington states that this company has won its case before the General Land Office. When the company applied for patent land was included in the notes that was not included in the stakes, and the claim was jumped. The decision probably settles the contest. Gus Johnson, leasing on the property, has found good ore 300 ft. from the surface. The vein is said to be 4 ft. wide.

Portland Gold Mining Company.—The 300 men who were temporarily laid off on account of a scarcity of cars, have resumed work, and a large amount of ore is being hoisted. It is understood that the old Burns shaft and the third level in No. 2 shaft are showing high values. The collar of the Burns shaft is being raised 30 ft. for dumping facilities. New belt conveyors will soon be installed for handling the ore. The mill at Colorado Springs is said to be doing very satisfactory work.

Prince Albert.—It is understood that H. H. Barbee & Co. have secured a controlling interest. The company owns the Prince Albert, the Eureka and Beacon claims on Beacon Hill. At one time the property was quite a large producer, but it has not been actively worked of late.

Sedan Company.—The directors have called a meeting of the stockholders for September 23, to consider a reorganization. The new corporation will be organized under the laws of Wyoming, and will probably be called the Sedan Gold Mining and Land Company.

GEORGIA.

CARROLL COUNTY.

(From Our Special Correspondent.)

Klondike Gold Mining Company.—The property of this company, of Villa Rica, formerly owned by W. H. Roberts and R. H. Brown, of Jacksonville, Fla., was recently purchased by the Villa Rica Mining and Smelting Company.

FULTON COUNTY.

(From Our Special Correspondent.)

Georgia Lime Works.—This company, with a capital stock of $10,000, has recently been granted a charter for manufacturing and dealing in lime. The incorporators are H. K. Dunning and T. M. Randall, of Atlanta, and D. Van Smith, of Charleston, S. C. The headquarters are to be in Atlanta.

LUMPKIN COUNTY.

(From Our Special Correspondent.)

Barlow.—This mine has been leased by Sovey Tregent & Bruce, who are rebuilding the dam, and refitting 3 batteries, which will drop on ore from the Doghead vein. The ore is reported to run $7.

Lockhart.—The 60-ft. shaft and stopes are being unwatered to reach a vein said to be 6 ft. thick, and to run $7 per ton on the plates.

Standard Gold Mining and Milling Company.—While hydraulicking on the Tahloneka Mine, a vein 6 ft. thick, and averaging about $4 gold per ton, has been uncovered for a distance of 100 ft. The ore will be mined in open cut near the surface, and later followed on inclines. It goes to the Singleton Mill.

IDAHO.

BLAINE COUNTY.

Crystal Carbonate Mining Company.—Ogden, Utah, men have formed this company for developing some claims in the Lava Creek Mining District. The officers are T. G. Burt, president; J. M. Walker, vice-president; J. H. Knaus, secretary; T. D. Ryan, treasurer, and these, with John D. Carnahan, J. W. Guthrie and J. S. G. Longsdorf, form the board of directors. The company is capitalized at $300,000 in $1 shares. The claims have received considerable development.

Minnie Moore.—M. H. Lipman, of New York City, and M. M. Treadwell, of Los Angeles, Cal., recently visited this mine, near Hailey. The ore-body is reported between 200 and 300 ft. long, and about 4 ft. thick. The shipping galena is from 18 to 48 in., and flanked by 1 to 2 ft. of concentrating ore. The management will soon resume sinking below the 900-level. On opening the 1,100-ft. level, if the ore-body continues, the present 45-ton mill will be replaced by one of 100 tons capacity.

KOOTENAI COUNTY.

Bead Lake Gold Mining and Milling Company.—This company is opening a group of 9 claims on Bead Lake 5 miles northeast of Newport. A tunnel has been driven 635 ft. on a vein 4 ft. wide that carries gold and copper. Fourteen men are busy under O. V. Smith, superintendent. B. F. Seeley, of Northport, Wash., is president of the company.

SHOSHONE COUNTY.

Mining Developments.—Forty more men have been added to the force at the California Consolidated, up Nine Mile Gulch. The Mammoth property has employed 75 additional men. The other heavy producing properties which stored away concentrates and ore while trouble was pending, have cleaned up and shipped away all the surplus stock and are preparing to increase forces.

WASHINGTON COUNTY.

Macey Mining Company.—This company, consisting of Spokane men, is operating at Paradise Flat. The company's men are running a wagon road from the property to Black Lake, a distance of 6 miles, to facilitate hauling in machinery.

Black Lake Mining Company.—This company, near Black Lake, has completed the construction of a 10-stamp mill and a 2,000-ft. aerial tramway. The mill is running full capacity.

Rankin General Mining and Milling Company.—This company is preparing to install a patent process mill to treat the gold ores of the company's claims at the head of the west fork of Rapid River. The process was contrived by Manager Rankin.

ILLINOIS.

CHRISTIAN COUNTY.

(From Our Special Correspondent.)

Penwell Coal Company.—This company, of Pana, has contracted with the Goodman Manufacturing Company, of Chicago, for an electric plant and 2 10-ton locomotives for the mine at Pana.

VERMILLION COUNTY.

(From Our Special Correspondent.)

Jones & Adams Company.—This company, at its mine No. 2, at Catlin, is opening the Danville vein of coal, about 30 ft. above the Grape Creek vein which they have been working for several years. The Grape Creek vein is here rather faulty, and only part of the territory can be worked, and at such places the Danville vein is usually at its best. Both are 5 ft. 8 in. to 6 ft. thick, and both will be worked from the same shaft.

INDIANA.

VIGO COUNTY.

(From Our Special Correspondent.)

Coal Combination Promoted.—For 4 months A. M. Ogle, of Indianapolis; James H. McClelland, of Brazil, and J. K. Seiffert, of Chicago, have been securing options, which expire January 1, on the Indiana bituminous mines. They represent Chicago and New York City men, who propose to organize a company, capitalized at $25,000,000, to acquire the property; $12,500,000 being preferred and $12,500,000 being common stock. The deal is to include all the more important bituminous mines, but no attempt will be made to acquire block coal property. The object is to minimize expenses and to control the Chicago and Northwestern markets, where 85 per cent of the Indiana coal is sold. It is reported that John W. Gates is one of the promoters.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

A diamond drill will be used in exploring the properties under option to S. D. North, of Hancock, near Bear Lake, southwest of Calumet. Some rich conglomerate has been taken out, but it may have been float.

Trimountain.—The new mill at Freda will go into commission as soon as some changes are made. Samuel A. Parnall, recently appointed superintendent, has resigned, and will take a position in Mexico. Capt. James Chynoweth, of Calumet, will have charge.

Baltic.—Nos. 3 and 4 shafts are down to the 8th level; No. 5 shaft is below the 7th. Considerable mass and barrel copper is encountered in No. 4 shaft. There are 39 drills in commission, and the rock output is 1,400 tons per day.

Calumet & Hecla.—This company is making every effort to prevent the small fires which have recently occurred in No. 4 shaft, of the Calumet branch, officials believing an attempt was made to fire the entire workings of the mine. The force of watchmen has been increased and only trusted men are sent underground. Forty of the men at work at the time of the last fire were ordered to report at the mine office, where they were questioned by the superintendent, the mining capital and an attorney.

Franklin.—At the Junior branch of this mine, No. 1 shaft, to which work is confined, is sinking below the 16th level. Hoisting is in progress from the 15th level. Twenty-eight drills are in use, and the output is 940 tons of rock daily.

Isle Royale.—This company is confining work to No. 2 shaft, from which the daily output is 500 tons of rock, returning slightly over 1 per cent mineral, which is stamped with 1 head. Seventeen power drills are in commission. Drifting is under way at the 15th level, north and south, and 16th level south. Two hundred men are employed.

Quincy.—No. 7 shaft is sinking to the 55th level and producing 1,000 tons of rock daily. Drifting is underway at the 54th and upper levels. No. 6 shaft is shipping 1,000 tons of rock daily. Electric trams are in use at the 43d, 46th ,49th and 55th levels north, and 55th level south. One hundred and eighty power drills are in use, and 1,450 men are employed.

Tamarack.—This company is stamping 2,100 tons of rock daily. No. 3 shaft, at the North Tamarack branch, is the largest producer, shipping 1,200 tons daily. The lower levels are in good ground. Opening work at the new No. 5 shaft house is being pushed vigorously with 20 drills, and Rock shipments aggregate 500 tons daily. A duplicate of the Nordberg hoisting engine in use will be installed.

Tecumseh.—At this property, south of the Osceola, the shaft on the Osceola amygdaloid lode, is down 2,150 ft. The lode has not developed any commercial value.

Trimountain.—This company's new mill at Beacon Hill, on the shore of Lake Superior, is in commission, but 1 head at the Arcandian Mill at Grosse Point will be retained in service until other heads are installed. No. 4 shaft is down 185 ft.

Winona.—Stopes are opening at the 2d, 3d and 4th levels south from No. 2 shaft. A small building has been erected adjoining the shaft house for a rock crusher and engine.

Wyandot.—The perpendicular shaft on section 28 is down to rock. The overburden is 85 ft. deep.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Phoenix.—Work on the new 1-head stamp mill is advancing rapidly, and much of the equipment is installed. Recent developments on the West and St. Clair fissure veins have been favorable.

COPPER—ONTONAGON COUNTY.

(From Our Special Correspondent.)

The mines of this county are employing 775 men, according to the report of Richard Chynoweth, mine inspector. There was 1 fatality last year. It occurred at the Mass Mine.

IRON—MARQUETTE RANGE.

Cleveland Lake.—This Ishpaming mine is to have a new hoisting shaft to replace the present one. The shaft will have 4 compartments, and be 350 ft. deep. It will be about 800 ft. from the present shaft, or halfway to the old shaft of the Lake Superior Iron Company's Lake Mine.

Iron Mining Accidents.—But for the accident at the Negaunee Mine early in January, when 10 workmen were killed by a cave-in from surface, the percentage of fatalities among men employed in the mines of Marquette County during the year ending October 1, would have been much below the average. According to Mine Inspector Joseph Tregonning's annual report, there were 33 mines operated during the year, employing 5,518 men, or 318 more than during 1901. There were 29 fatalities.

The fatalities occurred at these mines: Negaunee, 13; Champion, 2; Republic, 1; Lake Superior Hematite, 5; Section 21, 1; Lake Superior hard ore, 1; Blue, 1; Section 16, 2; Foxdale, 1; Salisbury, 1; Volunteer, 1. Ten of the men were killed by cave in; 9 by falling ground; 2 falling down shaft; 2 run over by cars. The fatalities by nationality were: Finnish,

12; Swedish, 3; Italian, 3; English, 9; Irish, 1, and Norwegian, 1.

Lake Superior Iron Company.—At this company's Lake Mine, near Ishpeming the big stock pile is about cleaned up.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Easter Sunday.—James Luke, of Carthage, and Jamot Brown, of Chicago, have bought the fee of four mining lots on the Red Fox Lease, northwest of Alba, for $16,000. A shaft has been cut down to a splendid run of zinc, and it has been called the Easter Sunday Mine.

Missouri Blanket Vein Company.—The total real estate owned by the Blanket Vein Mining Company was sold at the west floor of the Courthouse in Carthage at trustees' sale. The property included several tracts of mineral land and several leases, all lying in the Prosperity District. They were all bought in a lump by the reorganization committee of the company for $10,000. This company has treated and sold immense quantities of ore, but expensive methods of operations have prevented it from making money.

Snow Bird Mine Sold.—The famous Snow Bird Mine, south of Carthage, the Miles Mine on the north and a number of other smaller properties adjoining have been sold to St. Louis parties for a total consideration of $100,000. The Snow Bird Mine is a very valuable property, having yielded a net profit of $1,500 a week for several weeks last past. The price paid for the Snow Bird was $12,000.

MINNESOTA.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

Several drills are at work between McKinley and Biwabik, one for the Elba Iron Company and some for private parties. Some ore has been found, part of it being very hard and of a high grade. Explorations will be pushed as rapidly.

A find of ore has been made on the northeast quarter of the northeast quarter of section 4, T. 58, R. 7, belonging to W. C. Yawkey. Adjoining it the Minnesota Iron Company has been working for some time and has found a considerable good ore.

MONTANA.

CASCADE COUNTY.

(From Our Special Correspondent.)

Nelson Coal Company.—This company has been organized by J. S. Nelson, S. M. Moore and George I. Danks, of Great Falls, to develop the coal seam at Sand Coule. The capital stock is $100,000. Prospecting during the past 6 months has shown the extent and quality of the seam.

DEER LODGE COUNTY.

(From Our Special Correspondent.)

Washoe Smelter.—William B. Morse, of Aguas Calientes, Mex.; Arthur L. Walker, of New York City; Cyrus Robinson, of New York City; Prof. R. N. Smith, of Hobart, Tasmania; A. Chester Beatty, of Denver, Colo.; C. W. Whitley, of Salt Lake City and D. W. Brunton recently visited this plant at Anaconda. With the exception of Mr. Brunton, who is connected with the Washoe works, the gentlemen were on a sight-seeing trip, a number of them being identified with the American Smelting and Refining Company.

The management contemplates building a flue to the top of the hill back of the works to carry off the fumes. Ranchers living on Mill Creek have suffered considerable loss of live stock from the arsenic from the ores settling on vegetation. A flue to the summit of the mountain nearly a mile in length, it is thought, will do away with the evil.

FERGUS COUNTY.

Central Montana Mines Company.—The Whiskey Gulch cyanide plant of this company, near Lewistown, is reported to be treating ore at a cost of 65c. per ton. Charles T. Durrell is manager. The bulk of the ore comes from Myrtle Basin, and is trammed through a tunnel ½ mile long, by horses. About 20 tons of ore daily comes from the Spotted Horse Mine. About 50 men are employed at the mines. The cyanide plant has a capacity of 225 tons, but is at present treating only 100 tons daily. The rolls, crushers, screens and conveyor belts are run by a 60-h.p. engine. Zinc shavings are used for precipitating the values.

FLATHEAD COUNTY.

Brick & Brannegan.—At this Cabinet mine about 50 men are employed. The 10-stamp mill is running steadily, and good clean-ups are made twice a month.

American Kootenai Company.—About 15 men are working on development work, electric drills are used. Four tunnels are being run. In tunnel No. 3 a rich strike of free gold ore is reported.

Eldorado Placer.—Work is in progress getting ready for an early run next season on the ground on Libby Creek.

Illinois & Montana Mining Company.—J. H. Geiger is manager of this company, and has a small force at work on the group of 4 claims on Fourth of July Gulch near Libby. A contract for running a tunnel 200 ft. is to be let.

GALLATIN COUNTY.

Montana Corundum Company.—The mill belonging to this company, of Bozeman, is now running. It is expected to begin shipment of corundum in a very short time.

The plant has a 10 by 16 Blake crusher, 2 sets of 14 by 24-in. rolls, screens for sizing the ore for vibratory jigs manufactured by the Colorado Iron Works; 3 2-compartment jigs and 2 Bartlett rubber top concentrating tables.

After the concentration the mineral is reground and goes to the graders, where 20 sizes or grains and flours are made.

The ore received from the mine is delivered into 200-ton bunkers above the crusher and passing through the latter to a belt conveyor, thence to the ore bin from which it is fed to the coarse rolls by an automatic feeder and carried from the rolls to the screens by a belt elevator. All the mineral produced on the jigs and concentrating table is delivered to a second elevator by trough conveyor and thence to storage bins over the recrushing rolls. The power plant consists of 2 Fairbanks & Morse Company's gasoline engines, the main engine being of 54 h.p., and the crusher engine of 16 h.p. Leverett Ropes is manager.

LEWIS & CLARKE COUNTY.

Elkhorn.—It is said this mine is again to be shut down and is likely to be permanently abandoned. The Longmaid Brothers, of Helena, acquired the property when it was supposed to be worked out, and spent a considerable sum of money in fitting it up, first in placing machinery in the mill, which did not accomplish the work expected of it, and also putting in machinery and pumps for unwatering the mine. The mine has been on the verge of closing down 2 or 3 times in the past year, but finally favorable arrangements were made with the East Helena Smelter to handle the ore, and large shipments have been made. The expense of keeping the water down, however, and the low price of silver, have prevented a profit. Miners have been leaving for several weeks, and only a few are now left to finish up. The pumps are being drawn.

Empire.—The new cyaniding plant to work the tailings dump and ores of the Empire Mine, west of Marysville, is in operation. The mill has been thoroughly rebuilt at an expenditure of $16,000, and it is now the largest cyanide plant in Montana, having a capacity of 600 tons of tailings daily.

The mill is equipped with automatic belt conveyors and other labor-saving appliances. It is estimated that there are over 125,000 tons of tailings on the dump, containing several hundred thousand dollars of gold. A 60-stamp mill was in operation on the property for a number of years and before its construction a 15-stamp mill was worked. Large bodies of low grade ore remain in the mine.

Montana Mining Company.—The output of the Drumlummon Mine for September was 1,456 oz. gold and 11,150 oz. silver, obtained from 2,500 tons of ore crushed and 13,100 tons of tailings from the dams. The estimated value of the tailings product is $23,900, and the total receipts $34,000. The cost of treating the tailings was $16,800, and the total expenses were $28,500, leaving a profit of $5,500.

MADISON COUNTY.

Toledo.—At this mine, near Sheridan, the ore bins are filled, and until the bins at the smelter are ready no stoping in the mine will be done. About 30 men are now employed in the mine. Meanwhile the 300-1,000 level is gradually being unwatered. But very little stoping has been done on either the 200 or 300-ft. levels.

MISSOULA COUNTY.

(From Our Special Correspondent.)

Western Montana Placer Company.—The Risdon dredge, formerly on the property, is being dismantled under the direction of a Mr. Worth. It is understood that the dredge has been sold to be moved elsewhere.

Woods Placer.—It is claimed that the final payment, amounting in all to $100,000, has been made. The new owners are in possession. Joseph Kasner, of Helena, has charge. Operations will continue during the winter. A sawmill has been put in to saw flume lumber, so that the new flume may be completed by spring. The property is on Hughes Creek. Missoula will be the company's headquarters.

PARK COUNTY.

Emigrant Gulch Gold Mining Company.—This company's property, in the Emigrant District, consisting of a number of placer claims and equipment, has been sold by Receiver Worthy McKee to Dwight L. Wing, of Peoria, Ill., and G. A. Winslow, of Livingston City, for $6,020. The property has been in litigation for some time. It was formerly owned by Burns and Winslow, who disagreed. The courts granted an accounting and dissolution of the partnership, and appointed McKee receiver. Wing and Winslow will immediately start work.

Gold Reef Company.—This company recently took over the Great Northern properties. J. H. McCormick will be the superintendent. Mr. McKenzie, general manager and consulting engineer, has been a member of the firm of Dickman, MacKenzie & Potter, of Chicago. The headquarters of the company will be Chicago. A local paper says, since this company took over the mines at Gilt Edge, 25 extra men have been put on the mines and mill. Considerable development work is being accomplished in the Chickadee, and the ore mined is being obtained from the Plattsburg, Peerless and the Chickadee. The tanks in the mill are being enlarged to double the capacity. A 10-drill Rand compressor is to replace the old 3-drill compressor, which has been used heretofore. A large supply of timbers is being laid in for development work this winter. A new boarding house to accommodate 70 men is being built. Mr. McKenzie is chief consulting engineer and manager, while J. H. McCormick will act as superintendent.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

Anaconda Company.—The company is putting in a new system of drainage by which all the large mines on the hill at East Butte, including the St. Lawrence, Never Sweat, High Ore, Green Mountain, Diamond, Bell, Modoc and Wake-Up-Jim, are to be drained through the shaft of the High Ore, which is down 2,300 ft. Seven large pumps are at work in the High Ore—3 on the 1,000, 2 on the 1,600, and 2 on the 2,200 level. The High Ore has very little water, except what flows in from other mines. A cross-cut is being driven from the 2,200 level of the High Ore to connect with the lower workings of the St. Lawrence, Anaconda and Never Sweat, and as soon as completed the water of these three mines will flow to the pumps of the High Ore.

Butte Reduction Works.—This plant is running full blast, having recovered from the fire that destroyed the reverbatory department. On clearing away the debris the furnaces and stacks were found in good condition, requiring but small repairs.

Gaynon.—Forman Wayne having resigned, Charles J. Adami, formerly civil engineer for the Butte & Boston Company, has been appointed foreman and assistant superintendent.

Snohomish and Tramway.—F. Aug. Heinze has petitioned the United States Court to order the receiver for these properties to place the money received from ore sales in some banking institution, where it will draw interest. The money belonging to the property in the hands of the receiver amounts to $221,000, and is deposited in the First National Bank of Butte, and being part of a current account it is not drawing interest. The matter will come up at the Helena term of Court on November 10.

NEVADA.

HUMBOLT COUNTY.

Lucky Girl.—The Montana Mining Company reports that the output for September was 505 oz. gold, and 302 oz. silver from 1,600 tons of ore crushed by the 20-stamp mill and treated by the cyanide process. The estimated return is $10,500, and the expense $6,800, leaving a profit of $3,700.

NYE COUNTY.

(From Our Special Correspondent.)

Gold Hill.—A 50-h.p. boiler and engine will be installed at once on the 200-ft. shaft of this mine at Tonopah. Sinking is porgressing rapidly.

North Star.—This Tonopah mine is down 400 ft., the bottom being mineralized porphyry.

North Star Mining and Tunnel Company.—This company has purchased from Harry Ramsey and co-owners of the Cross-cut and Cross-cut Extension claims their holdings. New machinery will be put up and work started on the shaft.

Ohio-Tonopah Company.—This company, under the management of S. A. Knapp, has erected the most powerful hoisting plant in the district. It consists of a 50-h.p. boiler with condenser; 2 8 by 12 engines, with double reels and post brakes housed in a 25 by 40-ft. building. A gallows frame with 5-ft. sheaves is in place over the 2-compartment shaft, which is down 250 ft. A 2½-h.p. gasoline engine operates the exhaust fan. Water is piped into the engine room from a tank on the hill. A light railway connects with the wood yard. The capacity of the hoist is 1,500 ft.

West End Company.—This Tonopah Company has resumed sinking in the 250-ft. shaft. The company has ordered new machinery, and as soon as it arrives will continue exploration.

STOREY COUNTY—COMSTOCK LODE.

Consolidated California & Virginia Mining Company.—At the annual meeting, held in San Francisco, October 20, over 190,000 of the 216,000 shares of capital stock were represented. All the old directors were re-elected, excepting Charles Hirshfeld, who is in Europe and who was succeeded by John W. Twiggs. The old officers were re-elected as follows: Charles H. Fish, president; A. W. Havens, secretary, and Jos.

R. Ryan, superintendent. An assessment of 25c. per share was levied, delinquent November 24.

NEW MEXICO.

SOCORRO COUNTY.

(From Our Special Correspondent.)

Jerome Mining Company.—This company, of San Acacio, which has been working since May, is getting some copper ore from a 60-ft. vein.

NORTH CAROLINA.

CABARRUS COUNTY.

(From Our Special Correspondent.)

Kluttz.—This gold property is southwest of Gold Hill, and is worked by the Kluttz Gold Mining Company, of Chicago, Ill., with William Hansbrough, of that city, as manager.

Phœnix.—Several years ago this gold mine was worked to 500 ft., and produced thousands of tons of ore that was treated by the Thies chlorination method at a good profit. It was closed down on account of some business complications and dismantled. At present Dr. F. L. Slocomb, of Pittsburg, Pa., is opening the mine, and extracting good quantities of ore, which is being piled up on the surface pending the erection of a mill. H. L. Shrom, of Concord, is the engineer in charge.

The vein is quartz carrying sulphurets of iron and copper, with about ½ oz. of gold per ton.

MONTGOMERY COUNTY.

(From Our Special Correspondent.)

Iola.—This gold mine is reported to have produced $16,000 worth of bullion this month.

RANDOLPH COUNTY.

(From Our Special Correspondent.)

Sawyer.—This gold mine was purchased some time ago by Minnesota men, who have erected a stamp mill and are getting good results. James Cronan, of Spokane, Wash., is making an examination of the mines and other property in this State.

ROWAN COUNTY.

(From Our Special Correspondent.)

Rowan.—This copper mine, under the management of Capt. R. D. Curd, of Salisbury, is erecting a 10-stamp mill and a copper leaching process, the invention of A. E. Mead, of Chicago, Ill., which extracts the gold at the same time. It is attracting much interest on account of the successful trial experiments. Mr. Mead is superintending the erection of the plant. The ore is reported as assaying 14 per cent copper and $4 gold per ton.

OHIO.

New Pittsburg Coal Company.—Francis L. Robbins, of Pittsburg, Pa., was recenty elected president; William K. Field, vice-president and general manager; Gilbert T. Preston, secretary and treasurer. These three officers, together with J. J. Nicholson, of Pittsburg, and A. E. Horton, of Cleveland, were elected directors.

PENNSYLVANIA.

BITUMINOUS COAL.

Pennsylvania Railroad Company.—Shipments of coal from January 1 to October 18, inclusive, were 1,636,080 short tons anthracite, and 20,895,958 tons bituminous; total, 22,532,038 tons, showing an increase of 5,121,214 tons in bituminous, and a decrease of 2,088,115 tons in anthracite, as compared with last year. Coke shipments were 7,816,947 tons, which is 1,321,558 tons more than last year.

Wellsburg Coal Company.—This company, with a capital of $200,000, and the Dunsford & Welsburg Railroad Company, also with a capital of $200,000, have formed one company, with open mines in the Buffalo Creek District in Brooke County. The other will construct a railroad 17 miles long, which will take the coal to Wellsburg, where the new road will connect with the Pennsylvania lines.

Joseph A. West, of Beaver; R. C. McLean, of Oakmont; Carl C. Law, Frank E. Reading, of Pittsburg, and L. F. Darrel, of Allegheny, are interested.

The railroad will start at Welsburg, and run to Titts Run, not far from Buffalo Creek. The mines to be opened will employ 400 workmen. The company has secured 900 acres, and is negotiating for that much more.

At Uniontown a deed was recently filed covering the sale of 1,012 acres of coking lands in the Masontown field, by Frank J. Hearne, to the National Tube Company, the consideration being $910,800. It is said Mr. Hearne bought this property some years ago at $160 an acre. Mr. Hearne was formerly president of the National Tube Company.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Black Hills Porcelain, Clay and Marble Company.—Over a ton of mica is quarried daily, and a car-load shipped monthly to Cleveland, O. The mica is said to bring $75 on board the cars at Custer. A new shaft has lately been started, from which most of the mica is taken. At the company's lithographic stone quarry a shipment is being taken out.

Grantz Gold Mining Company.—The main ledge has been reached in the shaft on the Roosevelt group at 85 ft. The company is to put on a steam hoist, air compressor and drills and pumps.

North Star Mining Company.—The 10-stamp mill is running full capacity.

Saginaw Gold Mining Company.—At the annual meeting in Custer these directors were elected: L. P. Woodbury, R. L. Boyers, Chicago, Ill.; Charles Noble, Brown City, Mich.; Wesley Schlichter, Saginaw, Mich.; Leroy G. Hoyt, Custer. The company has completed its shaft house 9 miles from Custer, and has the hoist, pumps, air compressor and drills working. Considerable ore has been taken from the vein near its outcrop.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Clover Leaf Mining Company.—The Uncle Sam shaft at Roubaix is 600 ft. deep, having been sunk 100 ft. within the last few months. A station is being cut, and sinking will continue to the 700 ft. The mill is now supplied with ore from the 500 ft., where the vein is about 400 ft. from the shaft. The water is all caught on the 500-ft. level, and the shaft below is comparatively dry. The pumps are lifting 400 gal. per minute. The Burlington Railroad is building a spur into the mill yard.

Deadwood-Standard Gold Mining Company.—The last semi-monthly clean-up resulted in $7,445. Provision is being made for winter work underground.

Hidden Fortune Mining Company.—The 60-stamp cyanide plant below Deadwood is to be completed by January 1. The framework is up and nearly enclosed. The power plant wil be adequate for 120 stamps, and another section of 60 stamps will be started as soon as the first section is finished. The Elkhorn Railroad is building 2 spurs from up the creek to the mill.

Homestake.—One of the large cyanide vats at the No. 2 cyanide plant burst recently, owing to a defective hoop block and much damage was done to the building. The vat was 54 ft. wide and 12 ft. deep, containing nearly 1,000 tons of tailings in solution.

Horseshoe Mining Company.—A sawmill is being built on the Iron Creek ground, west of Spearfish River, to furnish lumber for the new 1,000-ton cyanide plant at the Mogul Mine. The new plant will require 3,000,000 ft. of lumber. The company has enlarged the Pluma cyanide plant from 100 to 300 tons, and is running it steadily.

Jupiter and Boston-South Dakota.—These companies, having holdings on Blacktail Gulch, are to consolidate. The details are yet to be arranged. The Boston-South Dakota owns a 40-stamp mill.

Ontaro-Wanda.—Roderick A. Murray, lessee, has shipped silver-lead ore to the National Smelter of the Horseshoe Mining Company at Rapid City.

Pluma Cyanide Plant.—James Hall and Samuel McConnell, of Boston, have let a contract for building a 60-ton cyanide plant at Pluma station to treat Homestake tailings, impounded on a bar of the creek. The building will be 46 by 101 ft., and will contain 6 tanks, each 12 ft. high and 16 ft. across. The pneumatic process will be used. Work has started on the foundation. The owners have lately purchased claims in the siliceous belt to supply the plant after the tailings are treated.

Rossiter Mill.—Dorr & Lundberg, lessees, recently placed 708 oz. of bullion in the United States assay office at Deadwood, the result of a clean-up at this cyanide plant. They are now treating from 75 to 90 tons a day from the Buxton and Big Bonanza mines, under lease.

Spearfish Gold Mining Company.—The mill is reported cleaning up from $35,000 to $38,000 monthly at the Johnson Gulch cyanide mill. Bullion is deposited twice a month at the United States assay office in Deadwood.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Calumet Mining and Smelting Company.—The copper smelter may be running before spring.

Holy Terror Mining Company.—The Keystone 20-stamp mill is supplied with ore from below the 900-ft. level of the Holy Terror Mine. A drift being driven on the 1,100-ft. level from the Holy Terror to the Keystone, is now in good ore. The mill concentrates are shipped to the National Smelter at Rapid City.

Maloney-Blue Lead.—Work is soon to be resumed on this copper property after an idleness of nearly a year. There is a tunnel 1,800 ft. long on the property and several hundred feet of cross-cuts.

TEXAS.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Burt Refining Company.—This company lost a number of tanks and contents recently by lightning, but the flames were confined to a small area, and the loss will not exceed $3,000.

Beaumont Oil Field.—The work of reconstructing derricks and pumping plants destroyed by the recent fires is being pushed, and a large quantity of new and powerful machinery is being installed. Oil offered f. o. b. on cars is scarce, and shippers complain of inability to get cars. This accounts for the wide difference in the price of crude in tanks and the price on cars. Oil in tanks is worth 17@20c. bbl., and on cars 30@40c. Many consumers at distant points cannot buy at any price. Operators are now practically convinced that the field will soon be monopolized by the refineries, and that Jennings, Sour Lake and Saratoga must be looked to for fuel oil.

Two proposals to lessen derricks of five may be adopted. One is to compel everyone to use electric lights, the other to install a suction plant to draw off all the dangerous gases from the wells and settling tanks to a central reservoir, and to utilize it for fuel. August shipments were by water, 541,004 bbls.; by rail, 493,600; total, 1,034,604 bbls.

September shipments were by water, 467,983 bbls.; by rail, 380,835; total, 848,818 bbls.

Central Asphalt and Refining Company.—The refinery at Beaumont is running. The still capacity of the plant is 7,500 bbls. The offices of the company have been moved from Beaumont to Port Neches.

J. M. Guffy Petroleum Company.—This company is at work on its pipe line between Beaumont and Sour Lake.

UTAH.

(From Our Special Correspondent.)

Ore & Bullion Settlements.—The Salt Lake banks make the following reports on settlements for ore and bullion for the week ending October 24: American Smelting and Refining Company bullion, $198,700; gold, silver, lead and copper ores, $185,500; gold bars, $19,200; total, $403,400.

BEAVER COUNTY.

(From Our Special Correspondent.)

Cactus.—Some good finds are reported by M. M. Johnson, superintendent.

Horn Silver.—This mine at Frisco reports shipped 2 cars of ore to samplers in the week ending October 24.

Majestic.—The management has been tendered the use of Mr. Newhouse's experimental plant at the Cactus Mine for testing certain grades of ore.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—The consignments for the week closing October 24 were as follows: Eagle & Blue Bell, 8 cars ore; Yankee Consolidated, 5 cars ore; Mammoth, 9 cars ore; Genimi, 6 cars ore; Bullion-Beck, 4 cars ore; Lower Mammoth, 2 cars ore; total, 34 cars ore.

Ajax Mining Company.—At the recent annual meeting the following trustees and officers were elected: Thomas Weir, president; George A. Lowe, vice-president; W. S. McCornick, treasurer; J. M. Burt, secretary; these, with P. L. Kimberley, James Ivers and Henry M. Ryan completing the board. Messrs. Kimberley and Ivers replace C. K. McCornick and W. H. King.

Carisa.—It is stated that 2 ore bodies have been added to the reserves of this Tintic property, one 3 ft. wide in Northern Spy ground, on the 600-ft. level south, is reported to carry about 15 per cent copper, 60 oz. silver and $2 gold per ton.

Grand Central.—The 8,000-ft. tram from the mines to the loading station at Tintic, will soon be ready. The output will be doubled by this cheaper and more rapid transportation.

Pacific Consolidated Mining and Smelting Company.—The capital stock is $1,500,000, divided into 300,000 $5 shares. The officers are: W. F. Snyder, president; S. M. Levy, vice-president; C. O. Ellingwood, secretary and treasurer. The company proposes to develop the Amy group of 29 claims located in the Merrimac mining district. This is the Baltimore copper property that Messrs. Snyder and associates have been operating for a year past.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—The Columbia shipped 1 car of ore; Neptune, 4 cars; United States, 5 cars; United Bingham, 1 car; Petro, 1 car, and the Ben Butler, 4 cars during the week ending October 24.

United States Mining Company vs. Kempton et al.—This suit is on before Judge Riner, of Cheyenne, in the Federal Court. It is over extra lateral rights. W. H. Dickson and George Sutherland appear for plaintiffs, and O. Hiles and L. R. Rogers for defendants. Among the witnesses for the United States Company are Prof. O. A. Palmer, S. W. Tyler, of Colorado, and A. F. Holden, and for the Kempton, Col. E. A. Wall, J. E. Beveridge, Frank Morehouse, I. Hazelgrove and W. M. Smith.

United States Company.—The aerial tram is in commission. It handled 150 tons of ore the first day, and this tonnage will be increased as the smelter may need. The building of the $1,000,000 plant from start to finish has taken about 15 months.

SUMMIT COUNTY.

(*From Our Special Correspondent.*)

Park City Shipments.—The Mackintosh Sampler reports the following receipts for the week ending October 24: Daly West, 3,665,670 lbs. ore; Ontario, 1,007,360 lbs. ore; Silver King, 1,998,300 lbs. ore.

American Flag Mining Company.—This company, capitalized at $400,000 in $1 shares, controls the Thunderer and other claims between the Ontario and the Silver King holdings, making in all about 100 acres of patented ground. T. F. Singiser is president and treasurer; John G. Rhodin, vice-president and manager; E. B. Palmer, secretary. The property is owned and controlled by Messrs. Singiser and Rhodin and Pennsylvania and Boston men. The main underground workings consist of 500 ft. of tunnel, an incline winze extending 2,500 ft. from the tunnel level and about 500 ft. from the surface, with numerous drifts and cross-cuts and 2 raises in ore. A new shaft house has been completed, and the hoist and other machinery is being put in place.

Creole.—The annual meeting resulted in the election of John Dern as president; L. P. Larsen, vice-president; W. B. Andrews, secretary and treasurer, who, with R. J. Evans and J. M. Lockhart serve as directors. It was decided to sink the 265-ft. shaft to 500 ft., to erect a larger shaft house, and to retimber the shaft.

New York Bonanza.—The shaft on this Park City property is now down over 100 ft.

TOOELE COUNTY.

(*From Our Special Correspondent.*)

Stockton Shipments.—For the week ending October 24 the Cygnet sent in 2 cars, and the Commodore 1 car of ore.

Cygnet.—Superintendent H. Zerbe has sold 2 carloads of ore in Salt Lake. It is stated attention will be given to developing reserves. Levels are being driven on the 200 and 400 ft. stations.

Honerine.—Contracts are to be let for additional equipment, consisting of a complete power plant, with compressors. Machine shops and all necessary buildings are to be at the mouth of the long drain tunnel. It is stated a spur of the main line of railroad will be built to the mouth of the tunnel.

Utah.—This mine at Fish Springs shipped 1 car of silver-lead ore in the week ending October 24.

WISCONSIN

IRON—MENOMINEE RANGE.

Florence.—This mine at Florence will ship about 135,000 tons of ore this season, and will have no ore left in stock at the close of navigation. A force of 150 men is employed. Manager Vogel has made arrangements with the Northwestern Company to change the old tracks at the mine and build several new ones.

A new ore dock will be constructed, and a new drainage system has been planned, which will require a ¾-mile ditch. All the old docks are to be removed. The upper part of the new No. 4 shaft has been completed, and work on the new shaft house, 60 ft. high, is to start at once,. The main timbers for the shaft house are 65 ft. long and 18 by 18 in. square at the butt, are of white pine cut and from the company's lands. A trestle work, 600 ft. long, will be built to carry the ore to the new dock. The foundation for the new hoist is nearing completion.

WYOMING.

CROOK COUNTY.

(*From Our Special Correspondent.*)

Belle Fourche Oil Fields.—Five standard rigs are at work in various parts of this field, but none has yet reached the oil strata. Boring has been somewhat retarded through the inability of the operators to secure the proper casing orders for which in some instances were placed with Eastern supply houses 2 months ago. Two wells are down 700 ft. It is believed that oil will be struck at about 1,200 ft. A number of experienced oil men are interested in the fields. Several other rigs are to start work soon.

FOREIGN MINING NEWS.

CANADA.

BRITISH COLUMBIA—BOUNDARY DISTRICT.

(*From Our Special Correspondent.*)

Granby Consolidated Mining, Smelting and Power Company, Limited.—The open pits at this company's Old Ironsides and Knob Hill mines are growing large. The quarries extend north and south about 1,300 ft., and varying from about 50 ft. wide at the upper face to about 100 ft. near the mouth of the main tunnel. Besides this an area approximately 800 ft. long by 200 ft. wide has been stripped preparatory to quarrying. From the highest point of the ore outcrop of the main quarry down to the level of the Knob Hill No. 2 tunnel, is about 400 ft. vertically. Connected with this tunnel by winzes and lower levels are the workings of the Old Ironsides and Victoria mines, and below these the ore has been proved by the diamond drill to nearly 1,000 ft. depth. This immense ore body has been proved to be continuous along nearly 2,500 ft. The total output since shipments to the company's smelter at Grand Forks began is over 540,000 tons. The output has been restricted during the last 4 months by a shortage of coke at the smelter, and latterly by insufficient power due to low water.

The power plant heretofore in use is being supplemented by two Rand air compressors, to be driven by two 750-h.p. Westinghouse induction electric motors, giving together a 60-drill capacity, are being installed. Power is to be supplied by the Cascade Water Power and Light Company, which has its plant well advanced. Additional plant ordered includes rope drives for the compressors, 7 air receivers, 20 3¼-in. new Giant drills, and a 10-ton traveling crane. A big Farrel-Blake rock crusher, with 36 by 32-in. jaw opening, to be driven by a 100-h.p. electric motor, furnished by the Canadian General Electric Company, is being put in. A gravity tram connects the quarries with the ore bins above the crusher and another tram goes thence to the shipping bins.

BRITISH COLUMBIA—CASSIAR DISTRICT.

Atlin Mining Company.—This company at Atlin has made its last clean-up for the season. Next spring an extra flume will be put in, utilizing the water through the monitors for the full 24 hours, while this year actual piping was only carried on for an average of 7 hours out of 24. The company extracted about $40,000 for the season's work. It began piping on May 17. Contracts have been let for building a large reservoir and dam at the head of Eldorado Creek. A new supply flume, when completed, will give a head 380 ft., as against 170 ft. hitherto available. Manager R. D. Fetherstonhaugh is going to remain in Atlin all winter.

Societe Miniere.—At this property on Boulder Creek sluicing has stopped for the season. Recent returns are reported very good. Mr. Maliun, the company's manager is about to go to Paris, France, to report to the directors.

Sunrise Company.—This company at Atlin has opened the "yellow channel" on its Sabin ground and is down to bedrock. On its Discovery claim the company has made another clean-up.

BRITISH COLUMBIA—EAST KOOTENAY DISTRICT.

(*From Our Special Correspondent.*)

Crow's Nest Pass Coal Company.—When the miners resumed work at the Coal Creek Mines, near Fernie, it was with the understanding that when working they should be underground 8½ hours each day, including half an hour for dinner, and that if at the end of 2 months a majority should vote for a return to the former custom of 8 hours "from bank to bank," with no particular time for dinner, that system should be restored. A vote was taken recently, but the result was not satisfactory, since 108 of the 270 men directly concerned did not vote. The voting was restricted to the miners of only one of the company's mines. A committee representing the miners met the manager, Mr. Tonkin, who told them that the miners employed in the Coal Creek mines were making high wages. During September there were, he said, 57 miners employed in No. 1 Mine, and their average earnings was $127.71 per man, or an average of $5.18 $^{6}/_{10}$ per man per shift. The highest wage earned by any one man during the month was $172.50, and the lowest $101.90. The highest daily wage earned by any individual miner was $7.06 per day worked, and the lowest $4.08. The committee reported to the local Miners' Union, and its decision in the matter of hours underground has not been made public.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

(*From Our Special Correspondent.*)

Le Roi.—From May 1 to September 30 the mine has shipped 78,288 tons to the Northport Smelter, and the total net profits to the company therefrom are given as $418,069. The record is a remarkable one, considering the depressed copper market and ore scarcity and high price of coke.

The net profits for Le Roi No. 2 for September are given as $18,000.

It is generally understood that there will be a new deal all round in Le Roi circles, and that John H. Mackenzie, the present manager of the Le Roi Mine and Smelter, will shortly assume control of Le Roi No. 2. Rossland Great Western and the Kootenay mines in the place of Messrs. Bernard Macdonald and William Thompson, who are in charge at present.

War Eagle.—The concentration experiments started by Edmund B. Kirby, general manager of the War Eagle and Centre Star mines at the old Bullion Extraction Company's works at Silica, are reported to be progressing very satisfactorily, and the companies interested will probably erect a 500-ton concentration plant in the early part of next year. Mr. Kirby's experiments are to satisfy his directors, the manager having previously ascertained that the ores could be concentrated on a commercial basis. Mr. Kirby's plan is a combination of some well-known methods of water concentration, oil is not used in the process.

The combined shipments from the War Eagle and Centre Star to the Trail Smelter, about 12,000 tons monthly, will be doubled shortly under the new tariff for freeput and treatment. The announcement is authorized by Vice-President I. G. Blackstock, of Toronto.

BRITISH COLUMBIA—SLOCAN DISTRICT.

Arlington.—This Slocan mine is shipping part of its output to the Trail Smelter. Until recently, since the beginning of operations, its ore had always gone to Nelson.

Broken Hill Mining and Development Company.—This company is developing a group of 4 claims on the south slope of Mount Massive, on the north side of Wild Horse Creek, about 7 miles east of Ymir. There are about 83 acres in the group. A force of 24 men is employed. Over 2,000 ft. of development work is reported done on the Fourth of July and Willcock claims. The company has ordered a mill with a rated capacity of 20 tons per day from San Francisco, which is expected to be in place before January 1. All the buildings destroyed by forest fires have been replaced. The mill will be operated by means of water power taken from Avalanche Creek. Dams have been constructed and will be connected by a flume, and the flume from one dam to the millsite has just been completed. The company is now building an aerial tram from the mouth of the tunnel on the Fourth of July claim to the millsite. This tram will be 2,200 ft. long and will carry 2 buckets having a capacity of 1,000 lbs. of ore each.

ONTARIO—ALGOMA DISTRICT.

Algoma Steel Company.—This company, at Sault Sainte Marie, is building a great steel and concrete dock for receiving ore from the company's mines on the north shore of Lake Superior. These works are associated with the various enterprises of F. H. Clergue, at the Sault, and are under his management. There will be traveling cranes running the entire 2,500 ft. of the dock, and covering the extreme width of 300 ft. All this space will be arranged for ore pockets and railway tracks.

ONTARIO-LAKE OF THE WOODS DISTRICT.

(*From Our Special Correspondent.*)

Big Master.—The stamp mill at this mine at Manitou is running steadily. The ore shows no diminution in values or quantity, and the second clean-up will be quite equal to the first.

Dominion Gold Mining and Reduction Company.—These works and the Scramble group of mining claims near Rat Portage, have been transferred to the Keenora Mining Company, a new concern, capitalized at $1,000,000. Americans headed by M. A. Myers, of the Big Master Mine, are the purchasers. The works have a capacity of about 60 tons daily.

Flint Lake Gold Mining Company.—This company has an interesting prospect under development. N. C. Westerfield is president, and C. L. Baker, of Philadelphia, is secretary. Theodore Bridenbach, of Rat Portage, is the engineer who designed and supervises the erection of the mill. The property is McA. 285 and 286, and contains 130 acres on Flint Lake, southeast of the Lake of the Woods. The vein is 14 to 25 ft. wide. The pay ore averages about 8 ft. wide for over 300 ft. The values of this outcrop are reported at $20 per ton. The company can quarry out 5,000 tons of ore without going below the level of the swamp. The ore will be put through a new No. 8 Krupp ball mill, 60-ton capacity, for wet crushing, in course of erection.

NORTHWEST TERRITORY.

Frank Coal Mines.—The main entry is in over 5,000 ft. Upraises are being put up at the No. 5 manway to the surface, a distance of 550 ft., to give a natural ventilation of over 10,000 cu. ft. of air per minute, while the fan now in use has a capacity of some 22,000 cu. ft. per minute. When the new plant is in operation the company will have no trouble in shipping 2,000 tons of coal per day.

MEXICO.

CHIHUAHUA.

(*From Our Special Correspondent.*)

Veta Grande.—Jose Maria Botello, owner of the Veta Grande and Verde mines, which were involved in the prospective deal of the Guggenheim Exploration Company on the Veta Colorado, has returned to Parral and reports the transfer of the said properties for $250,000 gold.

San Cristobal.—This mine, near Palmilla Hill, operated by the Boston & Parral Mining Company is breaking 45 oz. silver ore and preparing to ship probably 300 tons per month. The mine was worked for a year without earning a dollar, but recently this ore was found in old works. G. A. Burr is consulting engineer.

DURANGO.

(*From Our Special Correspondent.*)

Velardena Mining and Smelting Company.—This company has recently petitioned to build an additional smelter with 400 tons daily capacity, at a cost of not less than $250,000. Construction is to begin at once, and the smelter is to be ready within a year.

SONORA.

(*From Our Special Correspondent.*)

The district police of Cananea have taken possession of a group of copper mines purchased some months ago

by the Copper Queen Company from Indianapolis people. L. L. Lindsay secured a judgment against the Indianapolis claimants on account of alleged failure to carry out a contract. The Copper Queen Company refused to give possession, hence the action of the police.

Rio Yaqui International Transportation and Metallurgical Company.—This company has been formed at Denver, Colo., by former Gov. Chas. S. Thomas, former Supreme Judge Luther M. Goddard and William Faulkner, of Denver, with other Eastern and Western men. The capital stock is $20,000,000. The company claims to control 18 miles of the Rio Yaqui Valley, 125 miles from the Gulf of California, and 175 miles southeast of Hermosillo. The mines produce silver, gold and copper, but are nearly 200 miles from a railroad, and only the richest of the ore has been shipped out. The plans of the new company include the building of a smelter at the mines or some nearby point. The company has also acquired 4,000 acres of coal land near Nogales. J. D. Blake has been named as secretary-treasurer ,and Victor Lucier, of Florence, Colo., will be in charge of the work.

SOUTH AMERICA.

ECUADOR.

Playa de Oro Mining Company.—The suit of this company against Otis S. Gage, is before the Court of Appeals, of New York. Mr. Gage claims he is fighting the majority stockholders in both State and United States courts. This particular action was brought to set aside a transfer of 5,000 shares of the plaintiff's stock made by Charles G. Francklyn to the defendant, Gage, for an accounting in respect to the same. The plaintiff alleges that Gage induced Francklyn to make the transfer by falsely representing to him that the company was indebted to him for a sum equal to the value of stock loaned by him. The defendant admits the transfer, but denies the other allegations. He claims that he made large expenditures for the company's benefit. The defendants, Gage and Dougherty, were the ones who brought the mining property to the attention of the other stockholders. They and two others sold 95,000 shares of the original stock to obtain working capital.

MINING STOCKS.

(Complete quotations will be found on pages 608 and 609.)

New York. Oct. 29.

The market is depressed, owing to the lack of interest by outsiders. Prices are generally lower than last week, and sales are just enough to keep the market from losing its equilibrium. Even the copper group is without support. Consequently we see Amalgamated selling in a day a number of shares which used to be a transaction of a few minutes, while quotations at the close seldom show a net fluctuation of more than one point. This week $65@63¾ were the extreme prices. Anaconda also shows little attention, even though it is offered below par. On curb the tendency of prices is downward, as speculation is influenced largely by Stock Exchange doings in Amalgamated. Greene Consolidated, of Mexico, was less active, selling at $22¼@$24¾, while the rights brought $42@892 per hundred. White Knob, of Idaho, at $14½@$12½ records dealings in less than 100 share lots. British Columbia holds at $7@$6½, and Montreal & Boston at $2¼@$2⅝. Little interest is noticeable in Union, of North Carolina.

Quicksilver common, of California, brought $3. Alice, of Montana, reappeared at 30c.

The Colorado list is featureless, few of the specialties in the Cripple Creek section showing sales at fluctuating prices. Small Hopes, of Leadville, came forward at 45c.

Comstock stocks are dormant, as operations on the Lode are not satisfactory. Consolidated California & Virginia is off its feet, selling at 85@87c. A 25c. assessment has just been levied on this stock, which is the first call in 2 years, and was a surprise as the company paid a 10c. dividend in July, 1901.

Auction sales recently included 2,000 shares El Cristo Gold and Silver Mining Company, of Colorado, par $2, at $1 for lot; 500 shares State Line Gold Mining Company, No. 2, of Colorado, par $25, at $2 for lot; 100 shares Central Arizona Mining Company, par $10, at $2 for lot, and 10,000 shares Yankee Girl Silver Mine, Limited, par £1, at $6 for lot.

After 11 years silence the directors of the Columbus & Hocking Coal and Iron Company have announced a dividend of ½ of 1 per cent. This is to be paid on the common stock which was increased to $7,000,000 in March, 1901.

Boston. Oct. 28.

(From Our Special Correspondent.)

Another dull and uninteresting week has been witnessed in the local market, until to-day, when a spurt in Copper Range Consolidated gave tone to the mining list. This stock has been gradually hardening from $59, the price it sold a week ago until to-day, when $3.50 was added to the quoted price, lifting it to $64.50. Business for the day footed up over 12,000 shares, but it is thought the orders emanated from one source with the purpose of exerting an interest in this security. The trading is considered largely professional, although the ease with which the price advances attracts more or less attention. The fact that this stock and Amalgamated Copper sold together today brought hints that an exchange might occur. It is undoubtedly true that Amalgamated people have large holdings of Copper Range Consolidated, and it is believed that eventually they will turn up with the ownership. It is reported that Lawson has an option on a large block of the stock.

A circular has been issued to St. Mary's Mining Land stockholders, offering 10,000 shares of stock at par, $25, bringing the total capital up to $3,750,000. The original $500,000 to pay for opening and equipping the one-half interest which the company owns in the Champion Mine, the other half being owned by Copper Range Consolidated, has been insufficient, and a further amount of $350,000 is now needed to complete the Champion equipment, including a four-head stamp mill, with a capacity of 2,000 tons a day. Each company will put in $150,000. Four shafts will also be completed. Already $1,635,000 has been spent and the management is now confident of success. Stockholders of record, October 28, can subscribe for one new for 14 shares held. St. Mary's stock is not listed, but is quoted nominally $50@$58. The last sale was at $56. The rights are reported $1.50 bid, with none offered.

What looked like a drive put Calumet & Hecla down to $495, its lowest price since 1898. Its high point was in 1899, when it sold at $895 per share. Mohawk spurted from $45.50 to $56.87½ in sympathy with Copper Range. There is talk of another $1 assessment on Mohawk, but nothing definite is known. Centennial sold up from $18 to $19.62½, and United States from $21 to $21.75. Pool operations in Guanajuato managed to move the price up to $4 on a considerable volume of business. The only sale of United Copper has been 15 shares at $32.50 on October 23. Dominion Iron and Steel has been fairly active at from $55.50 to $58.75, closing to-night at $57.75. Less interest is taken in this stock now.

Tamarack has lost $5 to $155. Isle Royale is selling at $14@$13.50.

Colorado Springs. Oct. 24.

(From Our Special Correspondent.)

The mining stock market did not show the improvement this week which was expected from the mine owners' association adopting the report of the committee appointed three weeks ago to investigate the water situation at Cripple Creek. On the contrary, prices generally declined and trading fell off, the market presenting a demoralized aspect at the close of to-day's call. It may be that a general stiffening in prices will come as soon as the mine owners start work on the deep drainage tunnel; but as this is liable to be several weeks, a permanent betterment of present conditions is not liable for some little time. There is, however, nothing in the general mining situation outside the water, to have caused a break; in fact, quite the opposite is true, for during the past seven days there have been some very encouraging developments in the way of new strikes and other happenings.

El Paso weakened somewhat, partly through false reports of an increased water flow, the stock selling down to 69½ from 72¼c. Elkton sold listlessly at 35 and 35⅝c. Nothing need be expected from this stock until the water problem is solved. Gould sold down from 8 to 6⅝c., the reported bonanza strike being largely discounted by later development. Isabella sold from 33c. to 34c., and down to 32½c., in keeping with the general softening. Portland went off 10c., selling from $2 to $1.90 a share.

Lexington sold at the beginning of the week at 5½@5¼c., but wound up without a sale. Work recorded a sale every day at 7¾c., and Mary Cashen sprung into notice through the recent strike in the 3d and 4th levels made by a Philadelphia leasing concern, the stock selling from 5½ to 5¾c., and back again to 5⅝c.

Salt Lake City. Oct. 24.

(From Our Special Correspondent.)

There have been more gains than losses on the various stocks listed and unlisted this week. The gains have been small and the losses little more than fractional. There has been some marked activity on one or two unlisted stocks, but by action of the governing boards of the Exchange, no stocks will be called or dealt in after November 10, unless they are listed and pay the nominal fee. This action will tend to simplify and much improve conditions. Upon reports of a strike in the Little Bell territory in Park City the shares jumped from $6.50 to $8. Three thousand one hundred shares were dealt in. The heaviest traders on the board have been Carisa, 10,600 shares at 21¼@20c.; Consolidated Mercur, 14,100 shares at $1.97½@$1.92½; May Day, 23,900 shares at 29@25¾c.; Star Consolidated, 20,700 shares at 22@17c.; Uncle Sam, 10,900 at 32¼@31c.; Ben Butler, 20,000 at 11@10¾c.; California, 50,200 at 39@35½c.; Century remains stable at $1.11@$1.06, with 3,300 shares coming out; Wabash, of Park City, 16,500 shares at $2.15@$1.91; Comstock, of Park City, has retreated to $1.10½@$1.10, 550 shares only appearing. The Naildriver, another of Park City's new companies, has put out 3,400 shares at $2.50@$1.90. Lower Mammoth recovered to $1.66, with 8,250 sales recorded. The sales of the last 4 days have amounted to 302,474 shares, which brought $198,066.

San Francisco. Oct. 25.

(From Our Special Correspondent.)

The mining stock market has been somewhat firmer, and more business has been done than for several weeks past. The improvement, however, affected only some stocks, others showing a considerable drop.

Some quotations noted are: Caledonia, 96@97c.; Consolidated California & Virginia, 82@83c.; Ophir, 82@84c.; Challenge Consolidated, 9c.; Overman, 9c.; Best & Belcher, 6c.

The Stock and Oil Exchange is showing quite a business under its new organization. Oil stocks sold more freely and prices were firmer. Sterling sold at $1.60; Monte Cristo, $1; Monarch, 18c.; Junction, 13c.; Independence, 6c. The heaviest trading was in Independence and Monte Cristo.

London. Oct. 14.

(From Our Special Correspondent.)

Some efforts have been made lately to stir up business in West Africans, as I reported a few weeks ago. Last week saw the formation of a new company called the Consolidated Goldfields of the Ivory Coast, Limited, which has been formed with a capital of £500,000, to acquire rights to search for minerals over large tracts of land in the French colony on the Ivory Coast. Beyond saying that the lands are believed to be auriferous the directors have no information as to the value of the country from a mining point of view. The promoters are well known in the City, and are connected with leading South African and other companies, and they are providing a good deal of the money required themselves It is essentially a company for rich speculators to go in for, as there is little or nothing to indicate the value of the properties.

COAL TRADE REVIEW

New York, Oct. 30.

ANTHRACITE.

The misleading reports in the daily press of the heavy output to be expected as soon as the strike was declared off caused producers to be flooded with orders, but at the same time kept down the retail demand, and prices have fallen greatly. Just at present retail prices are largely nominal and buyers await lower figures. The present cold wave is likely to have a decided effect. Its most marked result will probably be increased, urgency of buyers at shoal water ports, or points reached by canal. Coastwise freight are rising, and the advance may be heavy. Hence it is fair to expect that dealers at many shoal water ports will demand $1.50 per ton more for coal this winter than last.

The Philadelphia & Reading Coal and Iron Company rather took the trade by surprise when it announced on October 23 that until January 1, to cover many expenses due to the strike, its prices would be 50c. higher, making the quotation for free-burning white ash coal f. o. b. New York Harbor shipping ports as follows: Broken, $4.75; egg, stove and chestnut, $5.

Shipments from the mines are not increasing as fast as the public had expected. There is much friction over the retention of non-union men, the union miners are not showing any particular desire to rush work, a lot of repairs are being done, and some mines are closed by strikes, owing to the demands of union men to return to work on any basis that suits them, irrespective of the possible findings of the Arbitration Committee. Perhaps 75 per cent of the miners are busy, but the production is a long way from being 75 per cent of normal. One or two companies have received no prepared sizes at tide-water yet.

Consumers at points in the Northwest are waiting for prices to drop before buying. In Chicago territory many consumers have prepared to burn soft coal this winter. With the close of navigation, but a month away, lake receipts of anthracite are bound to be slight, prices will remain higher than usual and consumption will be correspondingly less. The prospective wholesale price for egg, stove and nut sizes is $6.50, Chicago, an advance of 50c. Comparatively speaking, but little coal can be expected before January 1, in view of the demand at points to eastward. Along the lower lakes and in Canadian territory retail prices have fallen, though little or no coal has arrived, and demands is heavy. Prices f. o. b. cars at Buffalo are: Broken, $5.25; egg and nut, $5.50. Along the Atlantic seaboard prices have fallen most, as this territory will have consideration first from producers. It is not yet settled whether the advance of 50c. per ton over the regular winter schedule made by the Reading Company will be followed by all the companies. Two at least—the Delaware & Hudson and Delaware, Lackawanna & Western—have not announced any change as yet. It is quite possible, how-

ever, that the companies may feel that the Arbitration Committee is likely to recommend a general advance in miners' wages, hence higher prices are necessary. Retail prices at New York have come down. To-day most dealers are asking $7.50. Buckwheat coal is $2.50 f. o. b. New York Harbor shipping port.

BITUMINOUS.

The Atlantic seaboard bituminous trade is comparatively quiet, though the market is very strong and demand is heavy; consumers having contracts continue to urge for deliveries. A considerable proportion of buyers that have been taking speculative coal are out of that market, and this has kept down speculative prices in spite of the short supply of speculative coal available. Prices are about $5 f. o. b. New York Harbor shipping ports for Clearfield. Some coal has been offered for less, but on the other hand, the better grades command more. The situation is still in the hands of the railroads, which are said to be handling an unprecedented amount of general freight, while grain shipments from Philadelphia are heavier than ever before. Coal shippers complain that the railroads, by going out of their way to transport commodities, paying higher freight rates, are injuring the coal trade. The poor car supply and slow and irregular transportation control the market. Total shipments to tidewater are apparently nearly 50 per cent less than a few months ago, but every mine, small or large, is shipping to the limit of its car supply.

In the far east consumers at the shoal water ports are demanding and getting most attention. All consumers receiving coal on contracts are asking for more, though their monthly allottments to date may be filled or even exceeded. The speculative market in that territory is slow, but the starting of the anthracite mines brought many buyers to New York, who took the opportunity to see bituminous sales agents and put a little pressure on them. Along Long Island Sound demand is rather strong, and the market is apparently a little short of coal. Consumers at New York Harbor points are taken care of fairly well. In the all-rail trade there is believed to be more distress than elsewhere, and the demand to keep mills and factories in operation is continuous.

Car supply at the mines is barely 50 per cent of the demand. Transportation from the mines to tidewater is slow and irregular, cars taking 1 or 2 weeks to come through. In the coastwise vessel markets freight rates are rising. At the lower ports larger craft are in good supply, but small vessels are very scarce. We qoute current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 70c.; Boston, Salem and Portland, 85c.; Wareham, Newburyport, Portsmouth and Bath, 85c.@$1; Bangor and Gardiner, $1@$1.10, with towages to latter port. Rates from the further lower ports are about 15c. higher.

Birmingham. Oct. 27.

(From Our Special Correspondent.)

The coal production in Alabama is once more normal. The mines of the Tennessee Coal, Iron and Railroad Company are in full operation. The railroads are not handling the product of the mines as promptly as they should on account of the scarcity of cars. Good prices prevail for the product. The production will be kept at its best just as long as it is possible. The men are being urged to remain steadily employed. Where the men lost several weeks on account of the strike in this district hard work is being done, and the output is strong. The weather has been very moderate, and still there has been a strong demand for every ton of coal that can be mined. What will be the condition in the hard weather, with the railroad situation not at all encouraging, is already being discussed.

The production of coke in this State is holding its own. This product is bringing the best price to-day that it ever has seen, and there is a scarcity. The coke ovens in operation are not losing any time, but the demands are greater than the production. The scarcity of coke in other States makes the article exceedingly expensive, and more than $5.50 per ton has been paid for it here. The new coke ovens in the course of construction will be ready for operation about the last of the year, or a little later. 250 ovens are going up at Flat Top Mountain mines in Walker County, and 250 at Virginia, in Jefferson County, the latter belonging to the Alabama Steel and Wire Comapny.

No change is to be reported in the steady activity in the finished iron and steel market. The rolling mills are in full operation, and there is a demand for every ton of iron and steel being manufactured. The stock houses at the rolling mills are still devoid of assortment, and have been for some months now. Good prices are being obtained. The strike of the machinists still interferes with the machine shops, while foundrymen have been out for some little time. The proprietors of several of the shops during the past week got out injunctions in the City Court in Birmingham restraining leading members of the Machinists' Union from interfering with their plants. Dr. Boland, of the Birmingham Machine and Foundry Company, states that during the first three months of the year, enough orders were taken in to last the plant for almost the entire year. The cast iron pipe trade is in good shape as well as the tube business.

The steel wire, rod and nail works at Ensley have had a department or two off for some days, but the full plant is now in operation. The steel plant belonging to the Tennessee Coal, Iron and Railroad Company is doing its usual work.

Several rumors prevail concerning future development in the Birmingham District. It is stated, but not officially, that Messrs. Schuer, of the Alabama Steel and Wire Company, will erect their proposed blast furnace near Cadsden, in Etowah County, where they lately purchased extensive ore lands. The company is opening coal mines and building coke ovens about 12 miles south of Birmingham.

Another rumor is that the Tennessee Coal, Iron and Railroad Company will build three furnaces in the district. Still another rumor is that the Republic Iron and Steel Company has practically about concluded to erect the steel mill which was so much talked about a year or so ago, besides a new blast furnace in this district. The report as to the steel plant is officially denied, but it is admitted that a new 12-in. finishing mill will be added to the rolling mills and that Nos. 1 and 2 furnaces at Thomas will be enlarged.

Williamson Furnace, a small 75-ton furnace, is in blast now. The first run was made Friday. Company will sell on the open market.

It is announced that agreements to maintain prices during the last part of the coming year are being made. At a meeting held in New York last week it is understood that a minimum price of $18 per ton for No. 2 foundry has been agreed upon and furnaces will be allowed to get as much over that price as possible.

BY TELEGRAPH.

Birmingham, Ala., October 29.—The Alabama Steel and Wire Company has decided to build its big blast furnace and steel plant at Gadsden, Ala. Contracts have been all let for these, and later on the company will erect at the same place three other furnaces. The same company has purchased the Gadsden Electric Light Works, and the steam railway line, and will expend altogether over $5,000,000 in that place.

Chicago Oct. 27.

(From Our Special Correspondent.)

There is little change in the wholesale coal market. Sales continue good notwithstanding the unusually mild weather and are of the same nature as in the previous weeks—almost wholly confined to Illinois and Indiana coal. There is some Hocking to be had from wholesalers at $5, but all Eastern coal is very slow in coming forward with prospects of no better condition for the winter. The main difficulty in obtaining both Eastern and Western coal is that of transportation. This difficulty is affecting the entire West and Northwest. Of smokeless grades there is little except New River; Pocahontas and Maryland are almost out of the market. New River sells at $6. Indiana and Illinois coal sells at $3@$3.50. The supply is becoming limited. Few of the mines have more than two weeks' supply above ground, and city stocks are lower than they have been for several months. Retailers report such general satisfaction with bituminous coal for purposes for which anthracite was formerly used, as to make it almost certain that the antharcite demand locally will be smaller for many months to come than it normally has been. Of course, the anthracite famine has wholly exhausted the supply and dealers are overwhelmed with orders and inquiries from people who think the supply of anthracite is being immediately replenished with the resumption of mining. It is hardly necessary to say that Chicago dealers have as yet no intimations that they will receive anthracite before January.

The municipal coalyard project, intended to supply consumers with bituminous coal, has been given up. A few car-loads of coal have been received by the city and disposed of at cost.

Cleveland. Oct. 28.

(From Our Special Correspondent.)

The car situation has increased the interest in the coal and coke trade in this territory. An order has been issued during the past week for the return of all equipment, which was loaned to roads in this territory during the coal strike. The withdrawal of this equipment has at once stopped the movement of coal from the mines to the lakes; lessened the supply to the retail dealers; put the factories on short rations; to say nothing of the shortage of coke which has affected the foundries and the steel mills by hampering the work of the blast furnaces. The lake coal situation has become deplorable as the movement of late has been exceedingly light in the face of the most urgent need in the Northwest that has ever been felt there. The shippers have found that during the first of the week their supply is fairly good while toward the latter part of the week it dwindles down to almost nothing. The slight movement that has started through Buffalo, is withdrawing some of the boats from the trade through the soft coal ports, but it is now assured that the movement through both hard and soft coal ports is but about equal to the movement so far through the Ohio ports, which ship bituminous coal. In the domestic trade the producers made an effort during the past week to reduce the price of coal, but a strong element opposed this, and the others did not try it alone. An effort was also made a few days ago at a meeting of the Ohio Coal Traffic Association to advance the rates of carriage of coal between the mines and all principal centers of consumption, but this movement also failed. Now it seems as if the failure of these roads to deliver the coal which is turned over to them is to seriously discommode the factories and others depending upon the immediate supply of coal, no one having a surplus.

Pittsburg. Oct. 28.

(From Our Special Correspondent.)

Coal.—Consumers who postponed placing orders for the winter's supply until the end of the anthracite coal strike in anticipation of lower prices have been disappointed. The retail dealers yesterday advanced prices to all customers to cover the increase of 30c. a ton made by the coal companies last week, and which became effective on Saturday. The demand for coal is unusually heavy, while the supply is limited, owing to the inadequate transportation facilities. The mines are being operated very irregularly in this district. There was a fair supply of cars the last two days of the week and yesterday, but to-day the situation is extremely bad. The mines of the Monongahela River Consolidated Coal and Coke Company are in full operation as the company has a large number of empty coal boats and barges.

Connellsville Coke.—The H. C. Frick Coke Company, which controls two-thirds of the production of the Connellsville region, has fixed the price of furnace coke for next year at $3 a ton. Some of the independent companies had fixed a price of $4 a ton, and it is believed the action of the leading producer in naming a lower rate is intended to prevent abnormal prices for coke, which would disturb the conditions of the iron and steel markets. Shipments are rapidly falling off, and the production will have to be greatly curtailed, as there is but little room left to store the surplus coke. There are no indications of an improvement in transportation facilities, and the blast furnaces in the Mahoning and Shenango valleys, and in the Pittsburg District are suffering. Gilt-edged prices continue to be offered for prompt shipment of coke, and it is almost impossible to get coke that has not been contracted for, at less than $10 a ton at the ovens. The *Courier*, in its last issue, gave the production in the Connellsville region for the previous week at 256,312 tons, a decrease of 209 tons. The shipments aggregated 10,582 cars, distributed as follows: To Pittsburg and river tipples, 3,795 cars; to points west of Pittsburg, 4,767 cars; to points east of Connellsville, 2,020 cars. This was a decrease of 980 cars compared with the shipments of the previous week.

San Francisco. Oct. 25.

(From Our Special Correspondent.)

The coal market continues quiet, but steady. No special changes are to be reported.

Prices.—Current prices for Coast coals to dealers are as follows: Wellington and Southfield, $8; Roslyn, $7; Seattle and Bryant, $6.50; Coos Bay, $5.50; white ash, $5. For Rocky Mountain coals, large lots, quotations are: Castle Gate, Clear Creek, Rock Springs or Sunnyside, $8.50; Colorado anthracite, $14. For Eastern and foreign coals, cargo lots, prices are: Pennsylvania anthracite, $14; Cumberland, $12; Welsh anthracite, $13; cannel, $9; Brymbo, $7.50; Wallsend, $6.50.

Foreign Coal Trade. Oct. 29.

There is no talk of exports at the present time. The coal recently bought in England is arriving here in cargoes. Most of these foreign purchases were speculative, and the resumption of work at the mines is likely to check transactions.

The London *Statist*, just received, says: "So far the American purchases of soft coal in this country have been by speculative dealers, who run a heavy risk of loss should the market collapse before their cargoes arrive for distribution. While the strike continued, and with winter approaching, many would face the risk, and hence the purchases which have been reported. But with the announcement of the termination of the strike this business will now cease. Therefore, one need not be greatly concerned about the effect of it on our own domestic coal bills this winter. In Cardiff dry coal has been chiefly required, and this has run up to rather over the price of best Admiralty steam coal—certainly an unusual position. In the North of England there is less attention paid to the American demand than to the probabilities in the much nearer markets of France and Belgium. In Scotland the American orders have not exceeded about 50,000 tons, house and hard steam coal, and this is a very small proportion of the output. In the North of England and Scotland the stiffening in price caused by the excitement of the first rush of American orders has been maintained by expectation of an extra winter demand from the Continent. As it is, the market has been sustained by one movement which in the nature of things is practically at an end, and by hopes of another movement which may never take place. More serious to the British consumer than either of these

movements is the result to be feared should the Welsh miners not come to a settlement with their employers before the sliding scale arrangement expires on December 31 next."

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of October 18, that the reported settlement of the American coal strike, combined with a shortage of ready tonnage, has caused a temporary weakening of the market for coal for prompt shipment. Quotations are: Best Welsh steam coal, $4.20@$4.26; seconds, $4.14; thirds, $3.96; dry coals, $4.32@$4.44; best Monmouthshire, $3.60; seconds, $3.48; best small steam coal, $2.64; seconds, $2.40; other sorts, $2.16.

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

The general tendency of the freight market is upwards on account of scarcity of prompt tonnage. Some rates quoted from Cardiff are: Marseilles, $1.40: Genoa, $1.20; Naples, $1.26; Singapore, $3.12; Las Palmas, $1.62; St. Vincent, $1.86; Rio Janeiro, $2.88; Buenos Aires, $2.64.

IRON TRADE REVIEW.

New York, Oct. 29.

The iron trade continues to be considerably embarrassed by the delay in the delivery of fuel in the Mahoning and Shenango Valley, and all through western Pennsylvania quite a number of furnaces are banked on account of non-delivery of coke. There is a rush to secure supplies, and premiums have been paid for fuel in several instances, but even with this the furnaces are not getting what they wanted. The consequently delay in delivering pig iron is embarrassing steel mills also. The latter are, moreover, disturbed by the failure of the railroads to take any finished material from their yards. Outside of these transportation difficulties, the trade is generally in very good condition, but matters will not resume their normal position until the railroads are in better shape.

While an official announcement has been made, it is stated that the H. C. Frick Company has fixed the price of furnace coke after January 1 at $3, f. o. b. Connellsville. This announcement has caused some surprise in the trade. Some people expect a further advance, as the Frick Company controls the larger part of the ovens in the Connellsville District and the other companies will probably follow suit, although some of them have been talking of higher prices.

Birmingham. Oct. 27.

(From Our Special Correspondent.)

Efforts are being made by pig iron manufacturers in the southern territory to fill contracts as rapidly as follows. There is some inquiry still being received for delivery during the first half of next year, and now and then there is an inquiry also for a small lot of spot iron, but as a general proposition the pig iron market in the Birmingham district is quiet. The production is much better than it has been at any time this year, and the indications are that it will be kept up. The raw material is in abundance as far as can be learned now, and the furnaces are in good shape. The Sloss-Sheffield Steel and Iron Company will be ready to blow in its No. 4 furnace at North Birmingham again by the end of this week. Oxmoor Furnace of the Tennessee Coal, Iron and Railroad Company is being worked on steadily.. Prices are firm. What little spot is selling brings $25, except in extraordinary cases. There is very little exertion being made to secure business, but all orders being offered are being handled, the producers expecting to be in better shape in the near future. The following quotations are made: No. 1 foundry, $21; No. 2 foundry, $20@$21; No. 3 foundry, $18@$18.50; No. 4 foundry, $17@$18; gray forge, $16.50@$17; No. 1 soft, $21; No. 2 soft, $20@$21. The railroads are doing well in moving the product, though there is some grumbling heard about the scarcity of cars.

Chicago. Oct. 27.

(From Our Special Correspondent.)

Sales of pig iron continue light. There is little disposition on the part of the furnace proprietors to make heavy contracts for next year in the face of the increasingly vexatious car shortage. This car shortage affects most the coke market; and the coke problem continues to be the pig iron problem. "Save your iron," has become the maxim of furnacemen, while "Get your iron" might almost be said to be the counter maxim of the foundrymen, to judge from their eagerness in seeking contracts. To all appearances the coke scarcity will continue for the winter. Advices from the Connellsville regions are to the effect that much more coke could be sent westward if cars for it could be furnished. The price of coke continues $11@$12 for furnace and $12@$14 for foundry.

In prices of pig iron there is no noticeable change. For delivery after May next these prices were quoted to-day: No. 1 Northern, $23.50@$24; No. 2 Northern, $23@$23.50; No. 3 Northern, $22.50@$23; No. 1 Southern, $24.15@$24.65; No. 2 Southern, $23.65@$24.15; No. 3 Southern, $23.15@$23.65. Small lots, either Northern or Southern, command $3@$4 premium for delivery this year.

Rumors have been current for two or three days that foreign iron is to be brought to Chicago by boat, but inquiry fails to confirm the rumor. But little foreign iron, on the whole, has come to Chicago.

Cleveland. Oct. 28.

(From Our Special Correspondent.)

Iron Ore.—The shippers and vessel men are in another contention over rates of carriage on ore from the head of the lakes. The shippers have protested all the while that an 85c. rate is not warranted and refuse to pay it, the United States Steel Corporation deciding to keep its boats in service a month longer than was expected for the purpose of carrying its point. The vessel men meanwhile are withholding their boats from the market and the movement is slow. The other shippers are so nearly cleaned up on their ore that they can get along with a limited amount of tonnage. The rates of carriage are: 80c. from Duluth, 70c. from Marquette, and 60c. from Escanaba.

Pig Iron.—A number of the furnaces in the Mahoning Valley have been banked for the past week, and although the coke supply eased up in some directions to-day other furnaces are even more securely tied up, for the lack of that material, than they have been. At best the supply is intermittent and a constant running of the furnaces is out of the question for the time being. This is due to an order given out by the railroads that all of the equipment which was loaned to roads in this territory should be sent back east to help out in the hard coal region. The furnaces find themselves sold up now to the first of next August, with no available wild material for sale giving a permanent and a good market to the foreign stacks. The prices are booming. Foundry iron for spot delivery is selling between $25 and $28 for No. 1 at the furnaces with none for sale here except in isolated cases, where new furnaces are going into blast. Scotch irons are quoted at $25.50 for No. 1, while Nova Scotia iron is bringing $23.50, delivered. The bessemer and basic producers are practically without any iron for sale, either for this year's delivery or for shipment during the first half of next year. For this reason they are not quoting any prices, but $21 would represent the basic market to July 1, and $23 the bessemer.

Finished Material.—The demand for steel plates has been the leading feature in the market during the week. It sems now as if the needs of the market have by no means been supplied by the heavy selling of the past few weeks, and that there is still a heavy demand for material. All of this is going to the mills which are demanding premiums, both for the current year's delivery and also for delivery during the first half of next year. The mills are so uncertain as to the supply of bessemer pig iron that they are refusing to make any quotations for long time delivery. The jobbers are now getting 2.50c. for both universal mill and for sheared plates, while the smaller mills are commanding 2c. to 2.10c. without difficulty. The structural steel market is also strong, and the larger mills are still taking orders for delivery during the first half of next year. This is shutting the smaller mills out of a good deal of business upon which they had counted. Prices are stable at 2.50@3c. out of stock, and 2.50c. from the smaller mills for quick shipment, while the larger mills are quoting 1.60c. Pittsburg on all material to be delivered before next July. Sheets are still in moderate demand, with, however, the mills in position to take further orders. The prices do not change from what has been quoted heretofore of 3.10c. to 3.25c. on No. 27, one pass cold rolled, out of stock, and 2.85c. to 2.95c. at the mills. The bar iron situation is more interesting because of the diversity of prices. The extraordinary cost of mill scrap prevents the mills from making such reductions as they think necessary to induce buying. Sales have been made at 1.80c. Youngstown and at 1.80c. Pittsburg, although the former quotation would seem to be nearer the market, and it is a question whether that is not too high. Bar steel prices do not change from 1.60c. Pittsburg for bessemer and 1.70c. Pittsburg for open-hearth. The billet market is steady, with prices as they have been, bessemer 4x4s bringing $30 a ton Pittsburg.

Philadelphia. Oct. 29.

(From Our Special Correspondent.)

Pig Iron.—The market is in a decrepid condition. Our Eastern furnace people who have been tied up between anthracite and coke are not hoping to increase their output for some time to come. Coke deliveries are irregular and prices are high, while anthracite will be a luxury for some little time to come. Our importers still report a fair business, but say that the great rush is over and that the anxiety which prevailed in the early fall has subsided. A good deal of iron is arriving and much more is booked for delivery during November. Consumers who have been buying feel quite easy over the assurances they now have that they will not be obliged to depend on home sources. Imported iron is costing a little more. A great deal of foreign iron is being used and, as a rule, our people are getting along very well with it. Quotations are $22 for bessemer; $21 for No. 3 Middlesboro; $23 for Scotch No. 1, and $21.50 for Scotch No. 3. American foundry is quoted at $24@$25 for No. 1 X; $22.50 for No. 2 X, and $22 for No. 2 plain. Standard gray forge sold this week at $19.50.

Billets.—Billets have not sold this week to any extent, The feeling is that between the foreign supply and the improving condition in western Pennsylvania that American billets can be had at $30 before long. To-day's quotations range from $31 to $32, but the users are well enough supplied to let these figures alone.

Merchant Bar.—For the first time for a good while mill owners have been on the outlook for desirable orders for winter. The association has not decided to take any official notice of the weakening tendency and a prominent official said to-day that there would likely be no occasion for any reduction in prices. Steel bars are selling at 1.75c., but some buyers are talking about 1.65c., and offering it.

Sheets.—Retail demand is better than a week ago. Wholesale demand is worse. The retail sales are all made at full prices.

Skelp Iron.—While manufacturers of skelp are fairly busy, there is not enough business to keep prices at the level they were during the early fall.

Pipes and Tubes.—Pipes and tubes appear to be on the down grade in large lots owing to the anxiety of a number of Western independent mills to secure large orders.

Plates.—The condition of the plate market is still highly satisfactory. Urgent buyers in some cases are still paying premium prices. Manufacturers are not able to keep their engagements, owing to reduced output. Small lots of ¼-in. plate are bringing 2.15c.; large lots go at 2c., and it is intimated at less. Universals, 2@2.10c.; flange, 2.10@2.30c., the latter being for small lots. Considerable firebox has been put under contract within a few days. Our locomotive builders and others are quite large buyers. Our shipyards have lately placed some large contracts, but the terms are not to be had.

Structural Material.—The structural material condition is slowly evening up. There is as great urgency as ever, but buyers find they can get more favorable dates for delivery. There are still a number of large contracts which have not been placed, but which have been virtually accepted. The parties concerned received assurance this week that their needs would be taken care of in a way to suit their necessities. Spot lots are quoted at 2.25c. here; mill quotations are 1.75c.

Old Rails.—Old steel rails are quoted at $22; and old iron at $25.

Scrap.—Heavy steel scrap is selling where it can be had at $21; choice railroad scrap ranges from $23 to $25; country scrap, where it can be had, brings $21; No. 2 light scrap, $17.50; low phosphorus scrap is quoted at $27, but we hear of none selling. Wrought turnings are swept up at $17, and cast borings at $10.

Pittsburg. Oct. 28.

(From Our Special Correspondent.)

Many of the blast furnaces in the Valleys have been banked, and those that are trying to operate are not receiving more than 25 per cent of the coke required. Some days the supply is somewhat better, but one or two days no coke was received. Pig iron production is practicaly at a standstill, and as a result the steel mills are seriously affected. Most of the coke that is being moved goes to the blast furnaces of the United States Steel Corporation, but with this advantage the production is not near the normal output. The Bessemer Furnace Association was to have begun delivery on October 1 to the big steel combine on the 200,000-ton order placed at $16.50 several months ago for shipment covering the six months ending April 1, but so far none has been shipped on this contract. Under these conditions it has been deemed advisable to defer opening of negotiations for iron to cover the requirements for the second and third quarters of next year. No contract likely will be made until some satisfactory arrangements are perfected for a coke supply, and it now seems probable that a conversion deal will be made. Some surprise was expressed to-day over the announcement of coke prices which have just been fixed for next year. The H. C. Frick Coke Company, a subsidiary concern of the United States Steel Corporation, has named $3 as the price of furnace coke after January 1. While an official announcement has not yet been made the report comes from an authoritative source. This company controls two-thirds of the product of the Connellsville region. There is no doubt but that coke will continue to be scarce for some time owing to the inadequate transportation facilities. Steel mills have been forced to suspend operations for lack of pig iron. Independent concerns that own blast furnaces are not in much better shape than those dependent on the open market. Alice Furnace at Sharpsville, owned by the Youngstown Iron, Sheet and Tube Company, was banked on Saturday, owing to the inability to secure coke. The Republican Iron and Steel Company, the

bar iron combine, is unable to supply the bessemer steel plant at Youngstown with pig iron, and it is closed. The mills of the combine also may be forced to suspend operations in a few days. The Carnegie Steel Company has blown out No. 4 furnace of the Duquesne group, and will rebuild and reline it. The furnace will be out of blast about two months, and will be entirely reconstructed at a cost of $250,000. It will be made 100 ft. high, and will be fitted with electric devices for top filling. The blowing out of this plant means a loss of 800 tons of pig iron daily. It is the best one owned by the company, and has beaten all records for production. The Monongahela Iron and Steel Company, operating an independent plant near West Homestead, is having plans prepared for a small blast furnace which will be erected adjoining the steel works. The proposed furnace will be a small one, and will have a daily capacity of 250 tons and will cost about $200,000.

The steel market is quiet, the principal independent consumers being out of the market, owing to the inability to meet the cut in prices of wire products and sheets. Production is lighter on account of the shortage of pig iron. There has been a decided improvement in demand for all wire products, since prices were reduced and the combine has booked enough business to keep its plants in operation for several months. The large concerns that have their own steel supply also are participating in the business, the small mills being shut out. The sheet market is in good shape, many new contracts having been made since the cut of $5 a ton in prices was made by the leading interest. The National Tube Company has advanced prices on boiler tubes averaging about 10 per cent. There is an unusualy heavy demand for this class of tubing.

The tin-plate export proposition of the American Tin-Plate Company to the Amalgamated Association of Iron, Steel and Tin Workers has been accepted in a modified form, and while no official announcement has been made the details are known. It is contended, and on apparently good grounds, that the workers made a mistake in not accepting the original proposition. This provided for a cut of 25 per cent in wages on about 1,500,000 boxes annually intended for export, and upon its acceptance the tin-plate combine proposed to go after the business and at once start its idle plants. The cut meant an average reduction on all plates made of about 3½ per cent. After discussing the question for several days the special convention of tin-plate workers voted to agree to a general cut of 3 per cent instead of a straight 25 per cent reduction on the export plates alone. It was proposed that 3 per cent be deducted from the earnings of all skilled workmen and paid into a trust fund to be controlled by the Amalgamated Association. It was provided that upon the American Tin Plate Company or any independent concern showing that a part of the product of the mills had gone abroad a reduction of 25 per cent of the labor cost on the export order would be allowed and the money paid over. The counter proposition was accepted by the tin-plate combine and as a concession the workers agreed to withdraw the demands for additional foot notes presented at the scale conference, but not acted upon. Under the revised proposition the American Tin Plate Company is relieved of its pledge that accompanied the original one to start its idle mills at once. No move has been made in this direction up to to-day, and it is hinted that the company will wait until there is a sufficient amount in the trust fund to warrant it in bidding for the foreign business of the Standard Oil Company and other packing interests. The conference committee of the Amalgamated Association is still in session here perfecting the details as the situation is a complicated one. Under the arrangement the workers in the independent plants will be forced to contribute 3 per cent of their earnings to the trust fund, but if their employers do not get any of the foreign trade the amount is to be returned to the men at the end of the scale year.

Pig Iron.—The pig iron market is stronger and bessemer is quoted at $23.75, Valley furnaces, for prompt delivery. Furnaces are not making any sales, and all that is available is controlled by middlemen. For the first quarter, $22.50, Valley, is quoted, and sales for delivery later in the year have been made at $21. Foundry iron prices also have been stiffened, and for No. 2 grade, $25, Pittsburg, is asked for prompt shipment, and $23 for next year's delivery. Gray forge is quoted at $21@$22, Pittsburg, for any delivery.

Steel.—There is no market for bessemer steel billets, and the price is nominal at $30 at mill, or $31 delivered at Pittsburg. Some large sales of open-hearth billets are reported at $32, maker's mill. About 10,000 tons of steel bars have been sold at the base price of 1.60c., but some mills are getting 1.70c. Shipbuilding concerns have placed some heavy contracts for plates, the tonnage during the past 10 days aggregating 30,000 tons. For late delivery the pool price of 1.60c. was named. Prompt shipments bring from 1.85 @2c.

Sheets.—There has been a decided revival in the demand for sheets since the cut of $5 a ton in prices, and most of the idle mills of the American Sheet Steel Company have resumed. Among the important resumptions has been the Aetna-Standard works at Bridgeport, O., with 17 mills. Black sheets No. 28 gauge continue to be quoted at 2.75c., and galvanized sheets at 75 and 10 per cent off.

Ferro-manganese.—The market has strengthened and the foreign product is quoted this week at $52.50.

New York. Oct. 30.

Pig Iron.—Buying continues on a hand-to-mouth basis. Southern furnaces have advanced prices. The resumption of anthracite shipments is hardly likely to bring as much relief to Northern furnaces as has been expected, owing to poor car supply. We quote for 1903 delivery, Northern irons at tidewater: No. 1X foundry, $23@$25.50; No. 2X, $22@$23; No. 2 plain, $21@$22. For Southern iron on dock, New York, No. 1 foundry, $24.75; No. 2, $24.25; No. 3, $23.75. Middlesboro pig is quoted at $19.50, in large lots, but for small lots and spot delivery, $22 is obtained.

Bar Iron and Steel.—Demand is active, with prices firm. We quote for large lots on dock: Refined bars, 2@2.05c.; common, 1.90@1.95c.; soft steel bars, 2@2.10c.

Plates.—Buying continues good. We quote for tidewater delivery in car-loads: Tank, ¼-in. and heavier, 2.05@2.20c.; flange, 2.15@2.25c.; marine, 2.25@2.50c.; universal, 2@2.20c.

Steel Rails.—Standard sections are still quoted at $28, f. o. b. mills for 1903 delivery; light rails, $30@$35, according to weight. Relaying rails are $28@$30 for heavy sections and $33@$35 for light sections.

Structural Material.—Demand continues strong, and several large contracts have been placed recently. We quote for large lots at tidewater: Beams, angles, channels and tees, 2@2.20c. For small lots and prompt delivery good premiums are paid.

Cartagena, Spain. Oct. 11.

(*Special Report of Barrington & Holt.*)

Since last report shipments have been 2,610 tons dry ore to Maryport, England, and 250 tons manganiferous ore to Marseilles. The iron ore market, however, is firm; inquiries for ores are brisk, and several new sales for prompt and forward shipment are reported having been made. Tonnage continues scarce and rates high.

Quotations are per ton, f. o. b. shipping port: Ordinary, 50 per cent iron ore, 6s. 9d.@7s.; special low phosphorus ore, 50 per cent iron, 7s. 3d.@7s. 9d.; special ore, 50 per cent iron, 3 per cent manganese, 6 per cent silicon, 8s. 9d.; specular ore, 58 per cent iron, 9s. 3d.; magnetic ore, 60 per cent iron, 5 per cent silicon, 11s. 9d. for lumps and 9s. 9d. for smalls. For manganiferous ores quotations are: No. 1, 20 per cent iron and 20 per cent manganese, 14s. 6d.; No. 1B, 25 iron and 17 manganese, 11s. 6d.; No. 2, 30 iron and 15 manganese, 10s. 6d.; No. 3, 35 iron and 12 manganese, 9s. 9d. All grades of manganiferous ores are rated at 11 per cent silicon and under 0.03 per cent phosphorus.

Iron Pyrites.—Pyrites, 40 per cent iron and 43 per cent sulphur, are quoted at 11s. 3d. per ton, f. o. b. shipping port.

CHEMICALS AND MINERALS.

(See also wholesale prices on page 610.)

New York, Oct. 31.

All the large consumers will soon have placed their contracts for chemicals for the coming year; in fact, certain branches are already booked. Prices, on the whole, have been somewhat less than last year, and judging from the quotations made on 1904 deliveries of certain heavy chemicals a still lower level is anticipated. There is no doubt that great economy will have to be practiced in the chemical manufacturing industry, if profits are to be realized. Fortunately, comparatively few concerns have public stockholders to whom they are obliged to pay regular dividends. As it is, most companies are financed by their officers and directors, who are willing to devote most of the earnings to the building up of trade, and hope for large profits later. We hear of new companies being floated, but from their large capitalization we judge they intend to do a stock jobbing business. We have already had some experience in this line, as the chemical trade knows well.

Heavy Chemicals.—There is trouble with transportation; and no relief is expected for some time, owing to the hurrying forward of fuel. Business in heavy chemicals over 1903 continues to be done at quotations below. Bleaching powder, of Continental make, for next year's delivery, brings $1.12½@$1.15 per 100 lbs., and for 1904 shipments quotations are around $1.10, which on a stiff offer might be shaded. Liverpool bleach for 1903 sells at $1.20@$1.25, and there is no doubt that large consumers can get a better price on 1904 contracts. It would not be surprising to see good bleach sell at $1 or even less within a few years, judging from present rate-cutting. Importers suffer most from these low prices, as they have to pay a duty of 1-5c. per lb. Chlorate of potash, owing to keen competition, has weakened for next year's delivery, and orders have been taken at 6½c.@7c. per lb., according to make and quantity. These are among the lowest prices on record, and indicate that domestic production is increasing. In this article also importers are contending with a high duty—2½c. per lb. Nevertheless, our large consumption has necessitated the importation of nearly double the quantity reported last year.

We quote domestic chemicals, per 100 lbs., f. o. b. works, as follows: High test alkali, in bags, 82½@87½c., for prompt shipment, and 77½@85c. for forward; caustic soda, high-test, $1.90@$1.95 for early delivery, and $1.80@1.87½ for futures; bicarb. soda, ordinary, $1, and extra, $3; sal soda, 60@65c.; chlorate of potash crystals, $7.50@$7.75, for immediate shipment, and $6.50@$7 for contracts. For foreign goods, we quote per 100 lbs. in New York: Alkali, high-test, 90@92½c.; caustic soda, high-test, $2.25; sal soda, 67½c.; bicarb. soda, $1.50@$1.60; chlorate of potash, $7.50@$7.75 for prompt, and $6.75@$7.25 for forward; bleaching powder, prompt, prime brands, Liverpool, $1.75; Continental, $1.55@$1.65; contracts at $1.12½@$1.25, according to seller and time of delivery.

Acids.—Speculators have hammered the price of oxalic acid, but trading has been only of a retail character. Practically nothing has been done about new contracts, as acid makers await news relative to the future market for raw materials. Two of these—sulphur and nitrate of soda—are likely to continue strong, as they are in the hands of combinations who favor a high-priced policy. Pyrites also are likely to remain unchanged in price, as this market is influenced by that for brimstone.

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

Blue vitriol	$4.60@$4.75	Oxalic com'l	$5.62½@$5.75
Muriatic, 18°	150	Sulphuric, 50°,	
Muriatic, 20°	1.62½	bulk, ton	13.50@15.50
Muriatic, 22°	1.75	Sulphuric, 60°	1.05
Nitric, 36°	4.00	Sulphuric, 60°,	
Nitric, 38°	4.25	bulk	18.00@20.00
Nitric, 40°	4.50	Sulphuric, 66°	1.20
Nitric, 42°	4.87½	bulk	21.00@23.00

Exports of copper sulphate from Great Britain in September were 1,274,560 lbs., making a total of 89,380,480 lbs. for the 9 months this year, as against 77,647,360 lbs. in the same period in 1901, showing an increase of 11,733,120 lbs., or about 15 per cent. The value, however, shows a marked falling off this year, as a result of the lower price for copper.

Brimstone.—The importation of 3,450 tons at New York last week has already gone to consumers. Consequently, spot best unmixed seconds are quoted up to $24 per ton and shipments, $23@$23.25. Best thirds are worth about $1.75 less.

Exports of brimstone from Sicily in September amounted to 33,588 tons, of which the United States received 10,231 tons best unmixed seconds and 2,800 tons best thirds. The total exports in the 9 months this year were 357,135 tons, as against 336,224 tons in the same period last year; showing an increase of 20,911 tons in 1902. Stocks in Sicily on September 30, 1902, were 322,999 tons, being considerably larger than previous years.

Imports of brimstone into Great Britain in September were 940 tons, making a total of 17,509 tons for the 9 months this year. Compared with the same period last year the imports show a decrease of 148 tons in 1902.

Pyrites.—Consumption is good for this season, and imports are more frequent. A strong market in Spain has stiffened prices here, but importers continue to quote as below.

The Rio Tinto Company, which has heretofore been selling its Spanish pyrites through agents, has made a new departure and retained Mr. Augustus D. Ledoux, as its representative in the United States and Canada, with an office in the Coffee Exchange Building, New York City. After graduating at the Columbia School of Mines, Mr. Ledoux was for some years partner to his brother, Dr. Albert R. Ledoux, in the firm of Ledoux & Co., of New York City, but later left New York to devote himself to his specialty, chemical engineeringfl He has erected some of the principal acid works in the South and elsewhere, building the original plant of the Richmond Chemical Works, subsequently merged with the Virginia-Carolina Chemical Company. Upon the consolidation Mr. Ledoux went to Nashville, Tenn., where he planned and erected the works of the Tennessee Chemical Company, in which corporation he held the offices of vice-president and general manager until accepting the agency of the Rio Tinto Company. Mr. Ledoux has had wide experience in the use of mechanical furnaces employed in burning pyrites, and until recently was also consulting engineer for manufacturers in Louisville, Ky., Alabama and Georgia.

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, 13@13½c. per unit. New York and other Atlantic ports. Spanish pyrites contain from 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

The imports of pyrites into Great Britain in September amounted to 52,976 tons, making a total of 471,140 tons for the 9 months this year. In the corresponding period last year the imports were 509,797 tons, showing a falling off in 1902 of 38,657 tons, equal to about 18,500 tons of sulphur.

Nitrate of Soda.—Consumption is increasing. An improved demand is noticeable in the anthracite coal region, and the fertilizer trade. Owing to the heavy deliveries in the past 3 months, large consumers are fairly well supplied, and are not in the market. Spot nitrate of soda has advanced from $1.82½ to $1.92½ per 100 lbs., and it looks as if prices would be maintained up to April arrivals.

The European situation is strong, and the coast market continues firm, while freights are unchanged.

The monthly statistical position of nitrate of soda up to and including August is compiled by us as below, in long tons:

	—Chile—		—UnitedStates—		—Europe—	
Mouth	Production	Exports	Imports	Deliveries	Imports	Deliveries
Jan.	103,550	87,176	16,345	15,616	78,080	66,400
Feb.	75,973	97,790	8,515	6,497	106,060	130,980
Mar. ...	94,343	147,547	11,198	11,200	127,640	190,410
Apr.	108,494	108,449	11,746	7,921	123,680	162,760
May	124,279	83,911	21,439	10,745	109,850	107,770
June	118,926	67,265	17,564	17,012	104,740	84,530
July	118,337	60,597	19,788	13,725	63,150	59,630
Aug.	121,375	140,063	8,414	12,455	58,470	55,140
Totals ..	865,277	792,798	115,009	95,171	771,670	857,620
Tot. 1901	845,639	745,072	139,426	105,792	892,670	990,090

The Chilean situation shows an increase of 19,638 tons, or 2.3 per cent in production, and 47,726 tons or 6.4 per cent in exports. The United States imports fell off 24,417 tons, or nearly 18 per cent, and deliveries 10,621 tons, or 10 per cent. In Europe there has been a decrease of 121,000 tons, or 13.6 per cent in imports, and 133,370 tons, or 13.4 per cent in deliveries.

The world's consumption in the 8 months ending August 31 is calculated at 1,028,927 tons, which compares with 1,170,259 tons in the corresponding period last year, showing a decrease in 1902 of 141,332 tons, or 12 per cent.

Supplementing the above statistics it will be interesting to give the prices obtained by the oficinas in Chile and the ocean freight rates paid by them. The prices given below represent the net cost and do not include purchasing commission:

Month	—Ordinary per qtl.— Prompt	Futures
Jan.	$1.61@$1.64	$1.58@$1.61
Feb.	1.59@ 1.62	1.60@ 1.62
Mar.	1.61@ 1.63	1.60@ 1.63
Apr.	1.61@ 1.62	1.61@ 1.64
May	1.52@ 1.59	1.53@ 1.60
June	1.52@ 1.53	1.54
July	1.47@ 1.53	1.29@ 1.43
Aug.	1.48@ 1.54	1.46@ 1.50
Eight Months	$1.47@$1.64	1.29@$1.64

Prices this year are somewhat better than 1901, and it is noteworthy that ocean freights have fallen, on an average, of over $1 per ton.

Concerning the Chilean market, Messrs. Jackson Brothers, of Valparaiso, write us under date of September 17, as follows: Although transactions have been very limited a better tone has prevailed, and offerings have been small. A few sales of 95 per cent for September and November deliveries have been effected at 6s. 4½d., for December at 6s. 3½d., and for January at 6s. 1½d.@6s. 2d., alongside terms. For the refined quality little interest has been shown, and we only hear of two sales for January delivery at 6s. 3½d. and 6s. 4d. alongside. Production for the first 8 months has been 19,077,000 qtls., against 18,644,000 qtls. during the same period last year, and the consumption, 22,685,000 qtls., against 25,838,000 qtls., still leaving a decrease during the year of 3,153,000 qtls. We quote 95 per cent, September-November, 6s. 4d.; December, 6s. 3½d.; January, 6s. 2d., and 96 pr cent, September-December, 6s. 7d.; January-March, 6s. 3½d., all ordinary terms sellers. The price of 6s. 4d., with an all-round freight of 17s. 6d. stands in 7s. 11d. per cwt. net cost and freight without purchasing commission. Sales reported during the fortnight have been 239,000 qtls., and resales, 22,000 qtls.

Sulphate of Ammonia.—Importers have made numerous sales from steamers soon to arrive, while jobbers are doing a moderate spot business. Shipments bring $2.95@$2.97½ per 100 lbs., and spot $3.

Phosphates.—Buying for export is not large, though prices favor booking orders. Shipments on old contracts are considerable, especially from Florida mines. Fortunately for exporters ocean freight rates are easy.

The Southern fertilizer combination is increasing its holdings in the Mt. Pleasant, Tenn., phosphate field, and recently purchased the Arrow mines of 700 acres. It is now in possession of some of the richest land in the State.

To show the growth of our export trade in Florida phosphates alone we give below the shipments in the 9 months ending September 30:

Destination.	High-grade Rock.	Land Pebble.	Total
Austria	9,965	.....	9,965
Belgium	31,732	.....	31,732
France	1,200	27,115	28,315
Germany	181,082	25,670	206,752
Holland	46,498	3,300	49,798
Italy	10,725	31,803	42,528
Norway and Sweden	13,042	15,435	28,477
Spain	2,950	.....	2,950
United Kingdom	36,143	16,900	53,043
Total, Europe	333,337	120,223	453,560
Australia	.....	5,046	5,046
Honolulu	2,103	.....	2,103
Total Exports	335,440	125,269	460,709
Domestic	.....	132,896	132,896
Grand total	335,440	258,165	593,605

Compared with the corresponding period last year exports show an improvement.

The shipments to Germany and Holland constituted nearly 60 per cent of the total quantity sent to Europe, which has been consumed in the manufacture of high-grade superphosphates. The land pebble phosphates are mostly marketed at home, though Italy, France and Germany are also large consumers.

Concerning the foreign phosphate industry it is learned that mining in Tunis has been quite active. The Gafsa Company shipped 160,692 tons phosphate from the port of Sfax in the 8 months ending August 31, which shows an increase of 60,122 tons, or 37.4 per cent as compared with the corresponding period last year. The litigation over ownership of the Kalaa-Djerda deposits has been finally decided, a Mons. Bellot receiving five-eighths of the land. The deposits are estimated to contain up to 10,000,000 tons of phosphate under 65 per cent. In Russia extensive beds are being worked in Bessarabia and Podolia, along the bank of the Duiester. The grade sometimes runs up to 75 per cent phosphate of lime and from 32 to 34 per cent phosphoric acid. Polish fertilizer factories are the sole consumers. Publicity is being given to the Ocean Island phosphate deposits. These are understood to be very extensive, and are worked by the Pacific Islands Company, Limited, which holds a 99 years' lease from the British Government. So far about 40,000 tons of phosphate have been shipped, chiefly to the Australian market. The phosphate is of high grade, and contains little iron and alumina.

The Government of South Australia is offering rewards for the discovery and working within the State of a deposit of marketable phosphate. If found on Crown lands, £500 will be paid, and if located on freehold lands, £250. The rewards will be payable at the treasury in Adelaide. At present the consumption of phosphates is being met by imports from Algeria, the United States, and other countries.

	—Refined per qtl.— Prompt	Futures	Ocean freights, per ton
	$1.67@$1.68	$1.60@$1.64	$4.80@$5.10
	1.64@ 1.66	1.62@ 1.66	4.20
	1.63@ 1.66	1.63@ 1.66	4.20@ 4.50
	1.64@ 1.65	1.64@ 1.65	4.20@ 4.50
	1.60@ 1.66	1.58@ 1.62	4.20@ 4.50
	1.59	1.58	4.20@ 4.50
	1.50@ 1.52	1.44@ 1.47	4.20@ 4.44
	1.44@ 1.45	1.44@ 1.50	4.50
	$1.44@$1.68	$1.44@$1.66	$4.20@$5.10

Phosphates.	Per ton F. o. b.	United Kingdom or European Ports. Unit.	Long ton.
*Fla. hard rock (78@80%)..	$6.50@$7.00	6¾@6½d.	$10.07@10.27
*Fla. land peb. (68@73%)..	3.00@ 3.25	4¾@5d.	6.65@ 7.00
†Tenn., (78@82%) export...	3.25@ 3.50	5½@6d.	8.58@ 9.36
†Tenn., 78% domestic.....	3.00	.....	.....
†Tenn., 75% domestic.....	2.75@ 3.00	.....	.....
†Tenn., 73@74% domestic..	2.30@ 2.40	.....	.....
†Tenn., 70@72% domestic...	2.10@ 2.25	.....	.....
‡So. Car. land rock.....	...@ 3.25	4½@5d.	5.67@ 6.30
‡So. Car. river rock.....	2.75@ 3.00	.....	.....
Algerian (63@68%).....	.....	5½@6¼d.	7.15@ 8.13
Algerian (58@63%).....	.....	5@5¼d.	6.00@ 6.90
Algerian (53@58%).....	.....	4¾@5d.	5.32@ 5.58

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

Liverpool. Oct. 15.

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

Trade in heavy chemicals is somewhat better, and there is no change in prices.

Soda ash receives moderate attention from buyers at usual varying prices as to destination. Nearest range for tierces, either spot or over 1903, may be called as follows: Leblanc ash, 48 per cent, £5 15s.@£6; 58 per cent, £6 2s. 6d.@£6 7s. 6d. per ton net cash; ammonia ash, 48 per cent, £4 5s.@£4 10s.; 58 per cent, £4 10s.@£4 15s. per ton net cash; bags, 5s. per ton under price for tierces. Soda crystals are in steady demand, and £3 7s. 6d. per ton, less 5 per cent, is generally quoted for barrels either spot or forward, with 5s. allowance if taken in bags, with special terms for certain export quarters. Caustic soda is not active, but there is a fair business passing, and quotations for both this year and over 1903 are firm, 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. Special quotations for the Continent and a few other export quarters. Bleaching powder is very dull, and quotations are nominal at about £6 10s. @£6 12s. 6d. per ton net cash for hardwood, with special quotations for the Continent and a few other export markets. Chlorate of potash is neglected, and nominally quoted at 2⅞d.@3d. per lb. net cash. Bicarb soda is unchanged and selling at £6 15s. per ton, less 2½ per cent for the finest quality in 1 cwt. kegs, with usual allowances for larger packages, also special quotations for a few favored markets.

Sulphate of ammonia is quiet and a shade easier at about £12@£12 2s. 6d. per ton, less 2½ per cent for good gray 24@25 per cent in double bags f. o. b. here, but the tone is rather steadier at the decline.

Nitrate of soda is rather firmer, holders now asking £9@£9 2s. 6d. per ton, less 2½ per cent for double bags f. o. b. here, as to quality.

METAL MARKET.

New York, Oct. 29.

GOLD AND SILVER.

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

Metal	September. 1901.	1902.	Year. 1901.	1902.
Gold:				
Exports....	$163,362	$514,501	$32,680,589	$30,980,791
Imports....	11,905,431	3,012,385	35,400,042	22,937,72
Excess.	I. $11,742,069	E. $2,497,884	E. $2,719,473	E. $8,043,064
Silver:				
Exports....	4,834,683	4,635,803	41,487,929	35,580,539
Imports....	2,195,227	2,397,640	22,491,144	18,702,077
Excess.	E. $2,639,456	E. $2,238,163	E. $18,996,785	E. $16,878,462

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 October 29, and for years from January 1:

Period.	Gold. Exports.	Imports.	Silver. Exports.	Imports.	Total Excess, Exports or Imports.
Week ...	$33,400	$23,779	$989,500	$17,795	E. $981,326
1902.....	24,755,518	3,258,326	21 920,129	960,446	E. 42,456,875
1901.....	26,108,329	4,055,363	25,524,100	3,146,985	E. 44,430,281
1900.....	36,631,703	4,839,872	32,440,473	3,930,651	E. 60,301,153

The gold exported this week went chiefly to the West Indies, and the silver, mainly as bullion, to London. Imports were from Central and South America.

Financial Notes of the Week.

The general condition of business continues good, and the effects of the settlement of the coal strike are apparent. The demand for money continues great, and high rates in New York continue to hold the speculative movement in check, which is, upon the whole, a good thing.

The statement of the New York banks, including the 59 banks represented in the Clearing House, for the week ending October 25, gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts..	$793,384,600	$884,589,700	$870,977,000
Deposits	843,391,500	954,496,100	882,685,300
Circulation	30,560,000	31,763,200	40,128,900
Specie	158,933,700	182,942,800	169,032,500
Legal tenders	57,946,000	70,394,400	69,420,300
Total reserve	$216,879,700	$253,337,200	$238,452,800
Legal requirements ..	210,847,875	238,624,025	220,671,325
Balance, surplus ..	$6,031,825	$14,713,175	$17,781,475

Changes for the week this year were increases of $5,526,800 in loans and discounts, $19,559,500 in deposits, $2,272,800 in circulation, $14,920,500 in specie, $2,142,600 in legal tenders, and $12,173,225 in surplus reserve.

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

	—1901— Gold.	Silver.	—1902— Gold.	Silver.
N. Y. Ass'd	$182,942,800	.....	$169,032,500	.....
England	181,757,055	.....	170,283,425	.....
France	471,792,200	$219,200,430	509,320,595	$221,882,010
Germany ..	164,110,000	63,825,000	162,905,000	59,775,000
Spain	70,030,000	84,500,000	71,510,000	97,245,000
Nethl'ds ..	28,779,500	28,558,000	23,451,000	32,223,500
Belgium ...	15,496,665	7,748,335	15,696,665	7,848,335
Italy	79,725,000	9,842,500	81,040,000	10,226,000
Russia	331,910,000	29,580,000	375,525,000	33,890,000

The returns of the Associated Banks of New York are of date October 25 and the others October 23, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

The course of silver the last week has been quiet. No indications of a movement are in sight. It would seem to require a Chinese inquiry or large coinage purchases to advance silver much above current level.

The United States Assay Office in New York reports receipts of 29,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to October 16 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.		Changes.
India	£6,257,910	£5,111,130	D.	£1,146,780
China	590,212	162,500	D.	427,712
The Straits	296,934	447,820	I.	150,786
Totals	£7,144,156	£5,721,450	D.	£1,422,706

Arrivals for the week were £153,000 in bar silver from New York, £15,000 from the West Indies, and £5,000 from Chile; total, £173,000. Shipments were £161,800 in bar silver to Bombay, £5,000 to Calcutta, and £1,700 to Colombo; total, £168,500.

Indian exchange continues firm, and all the Council bills offered in London were taken at an average of 15.96d. per rupee. Buying of silver for India is still very light.

The foreign merchandise trade of Great Britain for the 9 months ending September 30 is valued by the Board of Trade returns as below:

	1901.	1902.
Imports	£384,460,712	£388,871,037
Exports	259,686,939	258,862,357
Excess, imports	£124,773,773	£130,008,680

This shows an increase of £4,410,325, or 1.1 per cent, in imports; a decrease of £824,582, or 0.3 per cent, in exports; and an increase of £5,234,907, or 4.2 per cent, in the balance of exports. The gold and silver movement for the 9 months was as follows:

	1901.	1902.		Changes.
Gold:				
Imports	£17,306,608	£16,318,393	D.	£ 988,215
Exports	7,350,289	9,027,451	I.	1,677,162
Excess	Imp. £ 9,956,319	Imp. £ 7,290,942	D.	£2,665,377
Silver:				
Imports	8,760,707	6,545,668	D.	2,215,039
Exports	8,831,066	7,383,392	D.	1,447,674
Excess	Exp. £ 70,359	Exp. £ 737,724	I.	£ 767,365

Of the silver imported this year, £5,287,840, or 80.8 per cent of the total, is credited to the United States.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$0.40	$0.42
Peruvian soles and Chilean pesos	.38¾	.42
Victoria sovereigns	4.85	4.88
Twenty francs	3.85	3.88
Twenty marks	4.74	4.80
Spanish 25 pesetas	4.78	4.82

MISSOURI ZINC ORE MARKET.

Joplin. Oct. 25.

(From Our Special Correspondent.)

The amount of ore sold during the week was very large, yet shipments would have been heavier but for the scarcity of cars. At all the camps, except Joplin, not half enough cars were provided to ship the ore sold. Prices were practically unchanged from previous quotations. The ore from the Carnegie brought $39, the top price for the week. All other ores sold at the same figures as the week before. The assay basis was $35@$36 per ton for 60 per cent zinc. Lead ore continues at $49.50 per ton, but occasionally a premium is paid on particularly high grade. The shipment of zinc ore was 219 tons larger than the week before, and the lead shipments 103 tons less. The value of the output exceeded that of the preceding week by $6,750.

Following are the sales from the various camps of the Joplin District for the week ending October 25.

Camps.	Zinc, lbs.	Lead, lbs.	Value.
Joplin	3,371,300	209,530	$65,859
Galena Empire	790,810	232,170	18,398
Carterville	1,118,600	257,090	25,379
Prosperity	469,000	37,180	9,378
Cave Springs	256,280	2,490	4,413
Aurora	998,880	4,560	16,832
Spurgeon	168,550	38,910	3,233
Duenweg	556,310	65,710	11,540
Zincite	124,560	6,940	2,470
Orongo	93,140	19,400	2,099
Ash Grove	34,880	33,500	1,395
Reeds	224,110	.....	4,146
Neck City	95,180	.....	1,767
Central City	231,110	12,010	3,523
Carl Junction	201,350	.....	3,826
Carthage	262,840	12,510	5,051
Granby	409,000	38,000	5,675
Springfield	242,000	.....	4,659
Raymond	50,000	.....	950
Total	9,682,140	970,630	$190,603

Total 10 months, zinc, 444,992,060 lbs.; lead, 53,163,370 lbs.; value, $7,940,430.

Value for week, zinc, $166,647; lead, $23,956; value 10 months, zinc, $6,735,672; lead, $1,204,758.

OTHER METALS.

Daily Prices of Metals in New York.

October	Sterling Exchange	Silver—N. Y. Cts.	Silver—London, Pence.	Copper—Lake Cts. per lb	Copper—Electrolytic cts. per lb.	Copper—London, £ per ton.	Tin, Cts. per lb.	Spelter—Lead Cts. per lb.	Spelter—N. Y. Cts. per lb.	Spelter—St. L. Cts. per lb.
23	4 86	50⅜	23 5/16	11¾ @11⅞	11½ @11⅝	53¼	26½	4.05 @4.10	5.35 @5.40	5.15 @5.25
24	4.86½	50⅜	23 5/16	11¾ @11⅞	11½ @11⅝	52⅜	26½	4.05 @4.10	5.32½	5.15
25	4.86½	50⅜	..	11¾ @11⅞	11½ @11⅝	...	26¾	4.05 @4.10	5.32½	5.15
27	4.86⅜	50⅝	23 5/16	11¾ @11⅞	11½ @11⅝	52½	27 ¾ 27 ¾	4.05 @4.10	5.32½	5.15
28	4 86⅝	50⅝	23⅝	11¾	11½	52½	26⅞ @ 27 ¾	4.05 @4.10	5.32½	5.15
29	4.86½	50⅝	23¾	11¾	11½	52	@27	4.05 @4.10	5.32½	5.15

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

Copper.—The market has been lifeless throughout the week, and there is nothing of interest to report. Prices have given way slightly, and we quote lake copper 11¾c.; electrolytic in cakes, wirebars or ingots, 11½c.; cathodes, 11¼c., and casting copper, 11⅜c.

The market for standard copper, which closed last week (Friday) at £52 7s. 6d., opened on Monday at £52 10s., and the closing quotations on Wednesday are cabled as £52@£52 2s. 6d. for spot, and £52 5s. @£52 7s. 6d. for three months prompt.

For refined and manufactured sorts, we quote: English tough, £55@£55 10s.; best selected, £55 10s.@£56; strong sheets, £68; India sheets, £67; yellow metal, 6¼@6⅝d.

Exports of copper from New York and Philadelphia in the week ending October 28 were: Great Britain, 359 tons; Germany, 3145; Holland, 550; Belgium, 20; Italy, 140; France, 75; Sweden, 20; Brazil, 2; total, 1,511 tons. Last week the exports from Baltimore were 591 tons copper. Imports this week at New York were 35 tons copper from Japan, and 614 tons from Mexico; total, 649 tons.

Imports of copper in all forms into Great Britain, with exports of copper, including yellow metal, are reported for the 9 months ending September 30, as below, in long tons; the material being reduced to the equivalent in fine copper in the totals:

	1901.	1902.		Changes.
Copper ore	73,900	66,713	D.	7,187
Matte and precipitate	65,313	53,722	D.	11,591
Fine copper	50,304	73,553	I.	23,249
Total, fine copper	90,351	107,085	I.	16,734
Exports	32,134	38,334	I.	6,200
Balance	58,217	68,751	I.	10,534

Of the imports this year the United States furnished 740 tons of ore, 11,859 tons of matte and 36,408 tons fine copper, which compares with 767 tons ore, 13,497 tons matte, and 15,030 tons fine copper to the corresponding date last year.

Tin.—The higher values established have been well maintained, owing to a very good consumptive demand. Arrivals have been rather small. At the close we quote spot and October, 26¾@27c.; November, 26½@26¾c.; December, 26¼@26½c.

The foreign market, which closed last Friday at £119 5s., opened on Monday at £120 2s. 6d., advanced on Tuesday to £120 7s. 6d., and the closing quotations on Wednesday are cabled as £120 5s.@£120 7s. 6d. for spot, and £119 5s.@£119 7s. 6d. for three months prompt.

Imports of tin into Great Britain, with re-exports of foreign tin, for the 9 months ending September 30, were as follows, in long tons of 2,240 lbs.

	1901.	1902.		Changes.
Straits	19,274	20,693	I.	1,419
Australasia	2,198	2,327	I.	129
Other countries	4,630	2,582	D.	2,048
Total imports	26,102	25,602	D.	500
Re-exports	16,343	17,391	I.	1,048
Balance	9,759	8,211	D.	1,548

The decrease in total imports was 1.9 per cent; that in the balance retained for trade was 15.9 per cent. These figures indicate a considerable depression in the tin-plate trade.

Spelter continues rather irregular and somewhat lower prices have been accepted in a few instances. The closing quotations are 5.15c., St. Louis, and 5.32½c., New York.

The foreign market is very firm, good ordinaries being quoted at £19 5s., and specials 5s. higher.

Imports of spelter, or metallic zinc, into Great Britain for the 9 months ending September 30, were 69,736 long tons, against 50,031 tons for the corresponding period last year; showing an increase of 19,705 tons, or 39.4 per cent.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is firm, but rather quiet. The latest sales are on a basis of 5.17½c. for both prompt and future delivery.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt write from Cartagena, Spain, under date of October 11, that notwithstanding the weakness in spelter in London, local prices remain high for both blende and calamine. Exports for the week were 3,600 tons blende to Antwerp.

Lead has been in good demand, and the ruling quotations are unchanged at 3.97½@4.05c., St. Louis, and 4.05@4.10c., New York.

The foreign market is firm, Spanish lead being quoted £10 15s., and English lead 2s. 6d. higher.

Imports of lead into Great Britain for the 9 months ending September 30, with exports for the same period, were as follows, in long tons:

Iron:	1901.	1902.		Changes.
United States	34,196	41,815	I.	7,619
Spain	71,254	74,836	I.	3,582
Australia	48,243	45,705	D.	2,538
Other countries	10,256	13,772	I.	3,516
Total imports	163,949	176,128	I.	12,179
Exports	28,482	25,305	D.	3,177
Balance	135,467	150,823	I.	15,356

The lead credited to the United States is chiefly Mexican lead, refined in bond in this country.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is quiet at 4c. for Missouri brands and 4.05c. for desilverized lead.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartagena, Spain, under date of October 11, as follows: The price of silver during the week has been 12.50 reales per ounce. The exchange has gone down by 30 centimos, and is now 35.60 peseters to £1. The local quotation for pig lead on wharf has been 58 reales per quintal, which, on above exchange, is equal to £9 13s. 5d. per ton or 2,240 lbs., f. o. b. Cartagena. Exports have been 1,163,741 kgs. pig lead to London; 611,347 kgs. to Newcastle; 134,700 kgs. to Marseilles; a total of 1,919,788 kgs. for the week.

Antimony has been in somewhat better demand. We quote Cookson's 9@9½c.; Hallett's, 7½@7⅝c.; Hungarian, Japanese, Italian and U. S. Star, 7¼@7¾c.

Nickel.—The price is now quoted by leading producers at 40@47c. per lb., for large quantities down to ton lots, according to size and terms of order. The price for smaller lots, according to quality, runs as high as 60c. per lb.

Platinum.—Consumption continues good, and prices are firm. Ingot platinum in large lots brings $19 per oz. in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 73½c. per gram.

Quicksilver.—The New York price continues $48 per flask for large orders, with a slightly higher figure for small lots. In San Francisco prices are steady, and the quotations are $45.50@$46.50 per flask for domestic orders. For export orders $44 per flask is quoted. The London price remains £8 15s. per flask, with the same figure is quoted from second hands.

Imports of quicksilver into Great Britain for the 9 months ending September 30 were 2,426,921 lbs., against 2,573,595 lbs. for the corresponding period in 1901. Re-exports were 1,238,172 lbs., against 1,557,965 lbs. last year.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

Aluminum.	Per lb.
No. 1, 99% ingots	33@37c.
No. 2, 90% ingots	31@34c.
Rolled Sheets	4c. up
Alum-bronze	20@23c.
Nickel-alum	33@39c.
Bismuth	$1.50
Chromium, pure (N.Y.)	80c.
Copper, red oxide	50c.
Ferro-Molyb'um (50%)	$1.25
Ferro-Titanium (10%)	90c.
Ferro-Titanum (20@25%, N. Y.)	55c.

	Per lb.
Ferro-Tungsten (37%)	28c.
Magnesium	$2.75
Manganese, pure (N.Y.)	60c.
Mangan'e Cop. (20% Mn)	32c.
Mangan'e Cop. (30% Mn)	38c.
Molybdenum (Best)	$1.82
Phosphorus	45c.
American	70c.
Sodium metal	50c.
Tungsten (Best)	62c.

Variations in price depend chiefly on the size of the order.

Average Prices of Metals per lb., New York.

Month.	Tin. 1902.	Tin. 1901.	Lead. 1902.	Lead. 1901.	Spelter. 1902.	Spelter. 1901.
January	23.54	26.51	4.000	4.350	4.27	4.15
February	24.07	26.68	4.075	4.350	4.15	4.01
March	26.32	26.03	4.075	4.350	4.28	3.91
April	27.77	25.93	4.075	4.350	4.37	3.98
May	29.85	27.12	4.075	4.350	4.47	4.04
June	29.36	28.60	4.075	4.350	4.96	3.99
July	28.38	27.85	4.075	4.350	5.27	3.98
August	28.23	26.78	4.075	4.350	5.44	3.90
September	26.60	25.31	4.075	4.350	5.49	4.08
October	....	26.62	....	4.350	...	4.23
November	....	26.67	....	4.350	...	4.20
December	....	24.86	....	4.153	...	4.31
Year	....	26.54	....	4.334	...	4.08

Average Prices of Copper.

Month	New York Electrolytic. 1902.	1901.	New York Lake. 1902.	1901.	London Standard. 1902.	1901.
January	11.053	16.25	11.322	16.77	48.43	71.78
February	12,173	16.38	12,378	16.90	55.16	71.17
March	11.882	16.42	12.188	16.94	53.39	69.54
April	11.618	16.43	11.986	16.94	52.79	69.61
May	11.856	16.41	12.226	16.94	54.03	69.60
June	12.110	16.38	12.360	16.90	53.93	68.83
July	11.771	16.31	11.923	16.61	52.89	67.60
August	11.404	16.25	11.649	16.50	51.96	66.34
September	11.480	16.25	11.760	16.54	52.68	65.97
October	....	16.25	....	16.60	....	64.11
November	....	16.224	....	16.33	....	64.51
December	....	13.845	....	14.36	....	52.34
Year	....	16.117	....	16.53	....	66.79

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower.

Average Prices of Silver, per ounce Troy.

Month.	1902. London. Pence.	1902. N. Y. Cents.	1901. London. Pence.	1901. N. Y. Cents.	1900. London. Pence.	1900. Y. Y. Cents.
January	25.62	55.56	28.97	62.82	27.30	59.30
February	25.41	55.09	28.13	61.06	27.40	59.76
March	25.00	54.23	27.04	60.63	27.59	59.81
April	24.34	52.72	27.30	59.29	27.41	59.59
May	23.71	51.31	27.43	59.64	27.56	59.90
June	24.17	52.36	27.42	59.57	27.81	60.42
July	24.38	52.88	26.96	58.46	28.23	61.25
August	24.23	52.52	26.94	58.37	28.13	61.14
September	23.88	51.52	26.95	58.26	28.85	62.63
October	....	....	26.62	57.59	29.58	63.83
November	....	....	26.12	56.64	29.66	64.04
December	....	....	25.46	55.10	29.68	64.14
Year	....	....	27.11	58.95	28.27	61.33

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

DIVIDENDS.

Name of Company.	Latest Dividend Date.	Per Share.	Total.	Total to Date.
†Allis-Chalmers, pf.	Nov. 1	1.75	284,375	1,706,250
†Amalgamated	Nov. 24	.50	769,439	$19,656,687
§Anaconda	Nov. 13	.50	600,000	22,050,000
*Bald Butte, Mont.	Nov. 10	.06	15,000	1,282,148
*Bunker Hill & Sull.	Nov. 4	.03	9,000	1,433,000
*Central Lead, Mo.	Nov. 15	.50	5,000	320,000
*Cherry Hill, Cal.	Nov. 15	.00¼	2,500	60,000
Columbus & Hock. C. & I.	Dec. 1	.50	35,000	.....
*Con. Mercur, Utah	Nov. 10	.03	30,000	450,000
*Daly West, Utah	Nov. 15	..	108,000	2,151,000
*Imperial Oil, Cal.	Nov. 6	.20	20,000	240,000
Ontario, Utah	Dec. 20	.30	45,000	14,917,030
*Peerless Oil, Cal.	Dec. 1	.08	7,360	46,920
*Silver King, Utah	Nov. 10	.66⅔	100,000	5,850,000
Shelby Iron, Ala.	Nov. 5	6.00	60,000	690,000
*Thirty-three Oil, Cal.	Nov. 6	.10	10,000	110,000
†U. S. Steel, com.	Dec. 30	1.00	5,080,222	34,520,994
†U. S. Steel, pf.	Nov. 15	1.75	9,130,497	53,745,626

*Monthly. †Quarterly. §Semi-annual.

ASSESSMENTS.

Name of Company.	Location.	No.	Delinq.	Sale.	Amt.
Alaska	Utah	..	Nov. 17	Dec. 8	.03
Alta	Nev.	71	Oct. 23	Nov. 13	.05
Andes	Nev.	57	Oct. 20	Nov. 10	.08
California,	Cal.	..	Nov. 10	.....	.00½
Carmelita Oil.	Cal.	5	Oct. 13	Nov. 7	.01
Chollar	Nev.	60	Nov. 5	Nov. 25	.05
Columbus Con.	Cal.	..	Nov. 11	.....	.01
Con. Cal. & Va.	Nev.	..	Nov. 24	Dec. 15	.25
Con. Imperial	Nev.	..	Nov. 6	Dec. 2	.01
Crown Point	Nev.	87	Nov. 18	Dec. 9	.05
Diamond Con.	Utah.	3	Oct. 16	Nov. 3	.02
Equality Oil.	Cal.	..	Oct. 10	Nov. 9	.01
Fifteen-Three Oil	Cal.	..	Nov. 20	.....	.02
Fremont Con.	Cal.	..	Nov. 17	.....	.10
Julia Con.	Nev.	..	Oct. 17	Nov. 7	.02
La Puerte	Cal.	..	Nov. 6	.....	.02¼
Lady Washington	Nev.	..	Oct. 22	Nov. 12	.06
Laurel	Cal.	..	Nov. 5	.....	.02½
Linda Vista	Cal.	..	Nov. 6	.....	.03
Martha Washington	Utah.	11	Oct. 27	Nov. 17	.02
Mazeppa	Cal.	..	Nov. 15	.....	.02
Mercantile Crude Oil.	Cal.	..	Nov. 20	.....	.05
Mexican	Nev.	72	Nov. 18	Dec. 9	.10
New Manzanita	Cal.	..	Nov. 5	.....	.02
Northern Light	Utah	8	Nov. 20	Dec. 11	.02
Nyak Bay	Alaska.	..	Nov. 7	.....	.03
Olcorose	Cal.	..	Nov. 15	.....	.03
Olinda Oil.	Cal.	..	Nov. 3	.....	.01
Overman	Nev.	..	Nov. 10	Dec. 2	.10
Potosi	Nev.	64	Nov. 10	Dec. 1	.05
Silver Shield	Utah	2	Oct. 22	Nov. 13	.02
Sumdum	Alaska	..	Nov. 11	.....	.05
Sumdum Chief	Alaska	..	Nov. 11	.....	.05
Ultimo	Cal.	..	Nov. 15	.....	.10
Union Con.	Nev.	65	Nov. 12	Dec. 4	.10
Wedge Extension	Utah.	2	Oct. 20	Nov. 10	.00½
Yellow Jacket	Nev.	12	Oct. 21	Nov. 26	.10

STOCK QUOTATIONS.

NEW YORK.

Company and Location.	par val	Oct. 22. H.	Oct. 22. L.	Oct. 23. H.	Oct. 23. L.	Oct. 24. H.	Oct. 24. L.	Oct. 25. H	Oct. 25. L.	Oct. 27. H.	Oct. 27. L.	Oct. 28. H.	Oct. 28. L.	Sales
Acacia Colo.	$ 1	.....	.....	.....	.....	.....	.....	.....	.....	.07½	.....	.....	.....	1,000
Alice, Mont.	25	.....	.....	.....	.....	.....	.....	.....	.....	.30	.....	.....	.....	40
Amalgamated c., Mont	100	65 88	65 25	65.13	64.38	65.63	64.63	65.75	65.38	65.00	64.38	64 88	64.38	24,360
*Anaconda c., Mont.	25	.98	.....	.97	.....	.97½	.....	.....	.....	.97	.96	98¼	.....	2,980
Anaconda, g., Colo.	5	.20	.....	.....	.....	.20	.....	.....	.....	.....	.....	.....	.....	500
Argentum, J., Colo.	2	.02	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000
Brunswick, Cal.	1	.....	.....	.....	.....	.....	.....	.06	.....	.....	.....	.....	.....	100
Comstock T., s., Nev.	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Comst T Bonds	100	.05½	.....	.....	.....	.....	.....	.05½	.....	.....	.....	.....	.....	3,000
Con. Cal. & Va., g.s. Nev	2½	.89	.....	.90	.....	.....	.....	.88	.....	.85	.....	.84	.....	2,800
Creede & C. C., Colo.	1	.....	.....	.....	.....	.....	.....	.03	.....	.03	.....	.03	.....	1,100
Cripple Creek c., Colo.	1	.....	.....	.07½	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,500
Crown Point, Nev.	3	.....	.....	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....	300
Elkton, g., Colo.	1	.33	.....	.33	.....	.....	.....	.....	.....	.32	.....	.....	.....	1,800
Gold Dollar, Colo.	1	.....	.....	.05½	.....	.....	.....	.05½	.....	.....	.....	.05½	.....	4,500
Golden Fleece, Colo.	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,000
†Greene Con., c., Mex.	10	40.00	37.00	40.00	37.50	40.00	37.00	40.00	.....	40.00	42.00	.....	.....	9,955
Isabella, g., Colo.	1	.....	.....	.30	.....	.....	.....	.....	.....	.....	.....	.30	.29	2,000
Jack Pot, Colo.	1	.....	.....	.....	.....	.....	.....	.12	.....	.....	.....	.....	.....	1,000
Leadville, Colo.	10	.....	.....	.....	.....	.03	.....	.....	.....	.....	.....	.....	.....	550
Little Chief, Colo.	1	.....	.....	.....	.....	.12	.....	.....	.....	.....	.....	.....	.....	600
Mexican, Nev.	3	.19	.....	.....	.....	.18	.....	.....	.....	.....	.....	.23	.....	800
MollieGibson, g.s. Colo	5	.....	.....	.08	.....	.07½	.....	.07½	.....	.07	.....	.07½	.....	4,200
Ontario, s. l., Utah	100	8.63	8.50	.....	.....	8.75	.....	8.75	.....	.....	.....	8.75	.....	550
Ophir, s., Nev	3	.85	.....	.90	.....	.88	.....	.....	.....	.....	.....	.86	.....	700
Phoenix, Ariz.	1	.....	.....	.08	.....	.....	.....	.....	.....	.....	.....	.....	.....	500
Potosi, Nev.	3	.08	.....	.....	.....	.....	.....	.....	.....	.07	.....	.....	.....	3,300
Quicksilver, Cal.	100	.....	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....	.....	100
Quicksilver pf., Cal.	100	.....	.....	8 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Savage, Nev.	2½	.....	.....	.....	.....	.....	.....	.....	.....	.02	.....	.....	.....	500
Small Hopes, Colo.	20	.....	.....	.....	.....	.....	.....	.....	.....	.45	.....	.....	.....	100
Standard Con	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Syndicate, Cal.	1	.05	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	300
Tenn. c., Tenn	25	18.50	18.25	17 50	.....	17.25	.....	17.25	.....	.....	.....	17.00	.....	2,500
Union. c., N. C.	10	2.88	.....	3.00	2.88	.....	.....	.....	.....	2.88	.....	2.88	2.75	560
White Knob, g. s., Ida	100	14.50	13.00	14.88	14.25	14.00	.....	.....	.....	14.50	.....	14.50	13.00	1,850

†Rights. *Per cent.

Coal, Iron and Industrial Stocks.

Am. Agr. Chem., U.S.	100	25½	23	.....	.....	.....	.....	25½	.....	25½	22	25½	22	.....
Am. Agr. Chem. pf, U.S.	100	78	.....	.....	.....	78	.....	80	78½	90	80	83	80	.....
Am. Sm. & Ref., U.S.	100	48½	46¼	47¾	.....	47	46⅞	47½	47	47	46¾	46⅝	46	3,200
Am. Sm. & Ref. pf, U.S.	100	95¼	95	95½	.....	.....	.....	.....	.....	.....	.....	96	.....	1,400
Col. Fuel & I., Colo.	100	84⅜	82¾	85½	83½	89¾	85⅜	90¾	89½	92½	.....	91	88	86,000
Col. & H. C. & I., Colo.	100	24¼	24	23½	.....	23½	.....	24¼	23¾	23⅞	.....	.....	.....	2,400
Crucible Steel, U. S.	100	21⅜	21	21¼	21	21½	21	21⅜	.....	21⅝	21⅜	21⅝	21½	3,285
Crucible Steel, pf, U.S.	100	86	85⅞	86	85½	85½	85¾	86	.....	86	85¾	86¼	86	1,080
Int'l S. Pump, U.S.	100	51	.....	51	49	51	49	51	50	51	49	.....	.....	200
Int'l S. Pump pf, U.S.	100	92	.....	93	90	92	90	92	90	90¼	.....	92	87	400
Mong. R. Coal, Pa.	100	.....	.....	11½	11⅛	.....	.....	11½	.....	11⅜	.....	11⅞	11⅛	1,700
Mong. R. Coal pf, Pa.	100	.....	.....	40¾	40	.....	.....	.....	.....	40	.....	40⅜	40	555
National Lead, U.S.	100	29⅛	29	29	28⅜	28¾	28¼	29	.....	28½	28¼	28⅜	27¾	5,500
National Lead pf, U.S.	100	94¼	..	94	.....	94	.....	.....	.....	93½	.....	.....	.....	500
Penila Nat. Gas.	100	48	.....	.....	.....	.....	.....	48	.....	48	.....	48	47	350
Penila Nat. Gas, pf.	100	.....	.....	.....	.....	.....	.....	.....	.....	49½	49½	.....	.....	10
Pittsburg Coal, Pa.	100	30¼	.....	30½	31½	31	30¾	31	30¾	30⅞	30¾	31	30	6,346
Pittsburg Coal pf, Pa.	100	89⅞	89¾	89¾	89½	89¾	89⅜	89½	89½	89⅝	89⅜	89¼	89⅛	905
Republic I. & S., U.S.	100	23½	22⅛	22⅞	22½	22⅜	22¼	22⅜	21⅝	22⅛	21¾	22	21⅜	15,000
Republic I. & S. pf, U.S.	100	80⅜	79½	79½	.....	79¼	79	79½	79	79¾	79¼	79½	.....	3,100
Sloss-Shef S. & I., Ala.	100	68	67	67½	66	68	66⅝	68¾	.....	69	67	68¾	.....	2,500
Sloss-Shef S. & I. pf, Ala.	100	.....	.....	.....	.....	.....	.....	93	.....	94	92	.....	.....	100
Standard Oil, U.S.	100	674	669	.....	.....	675½	671	675	.....	680	677	681	678	134
Tenn. C. I. & R. R., Ala.	100	65⅝	65	65⅜	64½	66	65½	66¼	65¾	66	64½	65⅝	64½	6,200
U. S. Cast I. Pipe, U.S.	100	16½	15⅞	16¼	15⅜	.....	.....	16¾	15¾	16⅜	15¾	16½	16	5,825
U.S.C. I. Pipe, pf, U.S.	100	57¼	57	56⅜	55¾	.....	.....	57	.....	56⅜	56½	56¾	...	1,500
U. S. Red. & Ref., Colo.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U.S. Red. & Ref. pf, Colo	100	57	56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
U.S. Steel Corp., U.S.	100	40⅞	40¼	40⅜	40⅜	40⅝	40¼	40⅞	40⅜	40½	40⅛	40⅜	40	37,240
U.S. Steel Corp. pf, U.S.	100	89¼	88¼	89¼	88⅝	89	88½	89¾	89	88¾	88⅛	89	88¼	24,540
Va.-Car Chem., U.S.	100	66¾	66¼	.....	.....	68⅞	66	68⅜	67¾	67½	66⅛	67½	67	6,300
Va.-Car Chem. pf, U.S.	100	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Whouse Elect., Pa.	50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	215	.....	200
Whouse Elect., pf, Pa.	50	.....	.....	218	.....	.....	.....	.....	.....	.....	.....	.....	.....	100

Total sales, 302,715 shares.

BOSTON, MASS.*

Name of Company.	par val	Shares listed.	Oct. 22. H.	Oct. 22. L.	Oct. 23. H.	Oct. 23. L.	Oct. 24. H.	Oct. 24. L.	Oct. 25. H.	Oct. 25. L.	Oct. 27. H.	Oct. 27. L.	Oct. 28. H.	Oct. 28. L.	Sales
Adventure Con., c.	$25	100,000	21.00	.....	21.00	.....	21.00	.....	21.00	.....	21 00	20.50	20.50	.....	600
Aetna, Con.	5	100,000	60	.....	.....	.....	.....	.....	.....	.....	60	.....	.60	.....	1,250
Allonez	25	80,000	2.50	.....	2.50	.....	2.50	.....	.....	.....	.....	.....	2.88	2.50	671
Amalgamated, c.	100	1,538,879	66.00	65 13	65.75	.....	65.50	64.50	65.75	.....	65.00	64.25	64.88	64.75	2,412
Am. Gold Dreg.	5	90,000	.....	.....	.....	.....	2.13	2 00	.....	.....	.....	.....	.....	.....	300
Am. Z. L. & Sm.	25	60,000	.....	.....	12 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	50
Anaconda, c.	25	1,200,000	.....	.....	25.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
Arcadian, c.	25	150,000	.....	.....	.....	.....	4.75	.....	.....	.....	.....	.....	4 75	.....	360
Arnold.	25	60,000	75	.....	75	.....	.....	.....	.....	.....	.....	.....	.....	.....	100
Atlantic, c.	25	40,000	22.00	.....	23.50	22.50	23.00	22.00	.....	.....	23 00	22 50	.....	.....	106
Bingham Con., g. s.	50	150,000	.....	.....	.....	.....	29.00	.....	.....	.....	28 50	28.25	29.25	28.60	405
Bonanza.	10	300,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.70	.....	100
British Columbia.	5	250,000	.....	.....	.....	.....	7.00	.....	.....	.....	.....	.....	.....	.....	50
Cal. & Hecla, c.	25	100,000	.....	.....	5 10	.....	.....	.....	5.05	.....	5.05	.....	5.05	.....	111
Centennial, c.	25	90,000	18 00	.....	18.00	17 50	18.00	.....	18.00	.....	.....	.....	18.63	17 75	2,890
Central Oil	25	60,050	6 88	6.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	170
Cochiti.	10	182,250	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Con. Mercur, g.	5	1,000,000	.....	.....	2.00	.....	.....	.....	2 00	.....	.....	.....	2 00	.....	695
Continental Zinc.	25	22,000	16.00	.....	.....	.....	46.50	.....	.....	.....	16.00	.....	.....	.....	146
Copper Range Con.	100	285,000	59.75	59.00	59.25	58.50	60.00	59.00	60 75	60.00	61.50	60.50	61 50	61.00	18,601
Daly-West., g. s.	20	180,000	.....	.....	.....	.....	.....	.....	.....	.....	50.25	.....	50 25	.....	150
Dominion Coal.	100	150,000	1.28	.....	131¾	131¼	131½	1.31	.....	.....	.....	.....	.....	.....	100
Dominion Coal, pf.	100	30,000	.....	.....	1.17	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Dominion I & S.	100	100,000	58.50	57.25	58 50	57.00	57.00	56.00	58 75	57.50	57.50	56.75	57.75	57.00	8,100
Elm River.	12	100,000	.....	.....	3.00	.....	2 88	2 75	.....	.....	.....	.....	3 00	2.75	1,380
Franklin, c.	25	100,000	9 88	9.50	10 00	.....	.....	.....	9 75	.....	.....	.....	9 75	.....	325
Guanajuato Con.	5	385,000	3.13	.....	3 63	3 13	3.75	3 25	4.00	3.38	4.00	3.81	3.88	3.75	11 840
Isle Royale Con., c.	25	150,000	.....	.....	13 50	13.00	.....	.....	.....	.....	14.00	.....	13 50	.....	145
Mass Con., c.	25	100,000	14.50	14.00	14 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	70
Mayflower, c.	25	100,000	.....	.....	1.75	1 63	.....	.....	.....	.....	.....	.....	.....	.....	219
Michigan, c.	25	100,000	10.00	.....	9.50	.....	.....	.....	.....	.....	9.50	.....	9.50	.....	185
Mohawk, c.	25	100,000	46.00	45.50	46.00	.....	46.50	.....	46.25	46.00	46.50	46.00	46.88	45.50	1,480
Mont. Coal & Coke.	25	200,000	.....	.....	.....	.....	.....	.....	.....	.....	5.50	.....	.....	.....	150
Mont'l & Boston, c.	5	570,000	2.88	2.75	3.00	.....	3.00	.....	2.88	2.75	2.88	.....	2.75	.....	2,002
New Idria.	5	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
North Star.	10	250,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Old Colony, c.	25	100,000	.....	.....	2 00	.....	.....	.....	.....	.....	.....	.....	.....	.....	150
Old Dominion, c.	25	150,000	17 00	.....	17.00	16.00	.....	.....	.....	.....	16.63	16.50	16.50	.....	133
Osceola, c.	25	96,150	56.50	56.00	59.00	56.00	57.00	.....	.....	.....	58.00	.....	58.50	58.00	516
Parrot, s. c.	10	229,850	26.00	25.50	25. 0	.....	.....	.....	.....	.....	.....	.....	.....	.....	150
Phoenix Con., c.	25	100,000	4.25	.....	4.25	4.00	4.00	.....	3.75	.....	.....	.....	4.88	4.75	745
Quincy, c.	25	100,000	.....	.....	.....	.....	1.25	.....	1 25	.....	1.25	.....	.....	.....	35
Rhode Island, c.	25	100,000	.....	.....	2.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	120
Santa Fe, g. c.	10	250,000	.....	.....	1.75	1.63	.....	.....	.....	.....	1.88	.....	.....	.....	155
Shannon, c.	16	186,296	9 50	.....	.....	.....	9.38	9.25	.....	.....	9.75	9.00	9.50	9.38	455
Tamarack, c.	25	60,000	160	155	.....	.....	.....	.....	155	.....	.....	.....	157	155	320
Tecumseh.	25	80,000	.....	.....	1.06	.....	1.38	.....	1.50	.....	.....	.....	1 50	.....	205
Trinity, c.	25	160,000	11.00	10.75	11.00	10.75	.....	.....	11.00	10.75	11.00	.....	11.00	.....	675
United States, g.	25	250,000	21.25	.....	21.50	21.00	21.38	20.75	21.75	21.38	.....	.....	21.75	21.25	2,473
U. S. Coal & Oil	25	240,000	.....	.....	15.50	15 13	15.00	.....	.....	.....	15 38	15.00	.....	.....	918
Utah Con., g.	5	300,000	22 00	21.75	22.00	21.50	.....	.....	.....	.....	21 50	21.25	21.75	21.25	540
Victoria, c.	25	100,000	6.75	.....	6.75	6 63	6.75	.....	6.75	6 50	.....	.....	6.63	6.50	592
Winona. c.	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.63	.....	10
Wolverine, c.	25	60,000	59.00	.....	59.00	.....	60.00	59.00	59.50	.....	60.00	.....	.....	.....	725
Wyandot.	25	100,000	.....	.....	1 00	.....	1.00	.....	.....	.....	.....	.....	.....	.....	650

* Total sales, 65,887 shares.

PHILADELPHIA, PA.§

Name and Location of Company.	par val	Oct. 22. H.	Oct. 22. L.	Oct. 23. H.	Oct. 23. L.	Oct. 24. H.	Oct. 24. L.	Oct. 25. H.	Oct. 25. L.	Oct. 27. H.	Oct. 27. L.	Oct. 28. H.	Oct. 28. L.	Sales
Am. Alkali, Mich.	$50	.....	.....	13	.....	13	.....	.....	.....	.....	.....	.....	.....	240
Am. Cement.	10	7.93	7.75	8.25	8.00	8.38	8.13	8.50	8.38	.....	.....	8.75	8.25	3,111
Cambria Iron, Pa.	50	.....	.....	.....	.....	48.60	.....	48 00	.....	48 00	47.50	.....	.....	282
Cambria Steel, Pa.	50	28.63	28.50	28.63	28.38	28.50	28.25	28 50	.....	28.50	28.25	28 50	.....	2,821
Penn. Steel, pfd.	100	101	.....	.....	.....	101	.....	101¼	.....	101	100	.....	.....	210
Susq. I. & S., Pa.	5	.....	.....	.....	.....	2.88	2 81	.....	.....	.....	.....	.....	.....	140
United Gas I., Pa.	50	114	.....	114¼	113⅝	114¾	114	114¼	.....	114	113¾	114	113¾	1,175
Warwick I. & Steel.	10	6.50	.....	.....	.....	6.25	.....	.....	.....	6.25	6.50	.....	.....	267

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 8,246 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Name of Company.	par val	Oct. 20. H.	Oct. 20. L.	Oct. 21. H.	Oct. 21. L.	Oct. 22. H.	Oct. 22. L.	Oct. 23. H.	Oct. 23. L.	Oct. 24. H.	Oct. 24. L.	Oct. 25. H.	Oct. 25. L.	Sales
Acacia	$1	.08	.07⅞	.08	.07¾	.08	.07⅝	.08	.07⅝	.08	.....	.08½	.....	3,000
Alamo	1	.04	.....	.....	.03¾	.03⅜	.....	.04½	.03¾	.....	.03¼	.04½	.03	2,000
Am. Con	1	.02⅜	.....	.03	.02¼	.02¾	.02	.03	.02¼	.02¾	.02	.03	.02	.....
Anaconda	1	.20	.18	.19	.18	.20	.....	.20	.....	.20	.....	.30	.....	2,100
Ben Hur	1	.03	.....	.02⅞	.02¾	.03¼	.03	.03½	.02⅞	.03¼	.03	.03½	.03	1,000
Black Bell	1	.06	.....	.07½	.....	.07½	.....	.07½	.....	.07⅞	.....	.07½	.....	1,000
Blue Bell	1	.07	.06½	.10	.06½	.07	.06½	.07	.06½	.07	.06½	.07	.....	.....
C. K. & N	1	.09⅜	.06⅜	.09⅜	.09¼	.09⅜	.09¼	.10	.09¼	.09⅜	.09¼	.....	.09⅜	13,000
C. C. Con	1	.07¼	.06¾	.07¼	.06½	.07	.06½	.....	.06½	.07	.06½	.06½	.06¼	1,500
Dante	1	.03½	.03¼	.03⅜	.03¼	.03½	.03¼	.03½	.03¼	.03½	.03¼	.03½	.03¼	5,000
Dr. Jack Pot	1	.13½	.13¼	.13⅜	.13	.13¼	.13	.13⅜	.12⅝	.13¼	.13	.12⅝	.12½	13,950
Elkton Con	1	.35½	.35⅛	.35	.34⅝	.35⅜	.34	.35½	.34	.35⅜	.34	.34⅛	.33⅛	3,000
El Paso	1	.70	.69½	.70½	.70	.71	.70	.71	.70	.71	.70	.70¼	.71	9,000
Fanny Rawlings	1	.05½	.04⅛	.05⅜	.04½	.05¼	.05	.05½	.04	.05¼	.05	.04⅞	.04	.....
Findley	1	.09	.08	.10	.07	.10	.07	.19	.07	.10	.07	.10	.08	.....
Gold Bond	1	.04½	.03½	.04⅞	.04½	.04⅜	.04	.04½	.04⅛	.04⅜	.....	.04⅜	.04	1,000
Gold Dollar Con	1	.05	.04⅜	.04⅝	.04⅛	.04⅝	.04½	.04⅝	.04⅛	.04⅝	.04⅛	.04⅝	.04⅛	6,000
Golden Cycle	1	.62	.60¾	.62	.59½	.63	.60	.62	.60	.63	.60	.62	.59	1,000
Golden Fleece	1	.12	.....	.11¾	.10	.12½	.12	.....	.10	.12½	.....	.....	.....	7,000
Gold Sov'n	1	.....	.03	.03¼	.03	.03¼	.03	.03	.02½	.03¼	.....	.03	.....	.....
Hart	1	.04½	.03⅜	.04½	.03	.04¼	.....	.....	.....	.04½	.03	.....	.03	.....
Iron Clad	1	.03	.02	.....	.02	.....	.02	.03	.02	.....	.02	.03	.....	.....
Isabella	1	.34½	.33⅜	.33½	.33	.32½	.....	.33	.31¼	.33	.32	.32	.31⅝	7,660
Jack Pot	1	.13	.12	.12¾	.12¼	.12⅞	.12⅜	.12¾	.12	.12⅜	.12	.12½	.12¼	1,000
Last Dollar	1	.65	.40	.75	.50	.65	.50	.75	.....	.65	.12	.....	.....	.....
Lexington	1	.05½	.05	.05¼	.05	.05¼	.05	.05½	.....	.05¼	.....	.05¼	.05	2,000
Little Puck	1	.05	.04½	.05	.04½	.04⅝	.....	.....	.....	.05	.05	.04½	.04¾	7,000
Mol. Gibson	1	.05½	.04⅜	.04¾	.05½	.05½	.04¾	.05½	.....	.05½	.04¾	.05	.04¾	2,000
Moon Anchor	1	.....	.07½	.09	.07½	.09	.07½	.....	.07½	.09	.04¾	.08½	.07½	.....
Morning Star	1	.04¾	.04⅜	.04¾	.....	.04¾	.....	.05	.04¾	.04⅞	.04	.07½	.05	14,300
National	1	.04⅜	.01	.05⅜	.01¼	.01⅜	.01	.01⅝	.....	.02	.04¾	.02	.01½	2,000
Nellie V	1	.02	.01½	.02½	.....	.02	.01½	.02	.01½	.02	.01½	.....	.....	.....
New Haven	1	.03½	.03	.03¾	.03	.03¼	.03	.03⅜	.03	.03¼	.01½	.03¼	.02½	.....
Pappoose	1	.02	.....	.....	.02⅛	.....	.02	.....	.....	.02½	.03	.02	.....	.....
Pharmacist	1	.05½	.....	.05½	.05⅜	.05⅜	.05	.06	.....	.05⅜	.....	.05¼	.05½	27,000
Pinnacle	1	.06	.05¼	.06	.....	.06	.....	.02	.01⅜	.06	.05	.06	.05¾	.....
Pointer	1	.02⅛	.02	.02¼	.02⅛	.02⅛	.01¾	.02¼	.02	.02⅛	.....	.02	.01¾	23,000
Portland	1	2.00	1.90	2.00	1.90	1.95	1.80	2.00	1.80	1.95	01¾	1.96	1.86	1,900
Prince Albert	1	.03½	.03	.03½	.03	.03½	.03	.03½	.03	.03½	1.85	.....	.03	.....
Republic	1	.02⅞	.....	.02¾	.....	.03	.....	.02¾	.02	.03	.03	.02¾	.02	.....
Rose Maud	1	.03¼	.03	.03¼	.03	.03⅛	.03	.03⅜	.03	.03½	.....	.03½	.03	2,000
Sunset Eclipse	1	.03	.02⅞	.03	.02⅞	.03	.02⅞	.03	.02¾	.03	.03	.02¾	.02½	18,000
Uncle Sam	1	.01⅞	.01½	.02	.....	.02	.....	.02	.01⅜	.02	.02⅛	.02	.01¼	.....
Vindicator Con	1	1.15	1.00	1.10	1.00	.....	.....	1.05	1.00	.....	.....	1.07	1.00	1,000
Work	1	.07⅞	.07⅝	.07¼	.07⅝	.07¾	.....	.07¾	.07¾	.07⅞	.....	.07⅝	.07½	4,000

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 198,950 shares.

Colorado Springs (*By Telegraph.*)

Name of Company.	par val	Oct. 22. H.	Oct. 22. L.	Oct. 23. H.	Oct. 23. L.	Oct. 24. H.	Oct. 24. L.	Oct. 25. H.	Oct. 25. L.	Oct. 27. H.	Oct. 27. L.	Oct. 28. H.	Oct. 28. L.
Acacia	$1	.08	.07⅝	.08	.07⅝	.08¼	.08	.08⅝	.08	.09¼	.08¾	.09⅜	.08⅝
Alamo	1	.04	.03¾	.04⅛	.03¾	.04⅛	.03⅞	.04⅛	.03⅝	.04	.03¾	.04	.03¾
Anaconda	1	.20	.18	.20⅝	.18	.20	.18	.19	.18	.20	.18	.20	.16
Cripple Creek Con	1	.07	.06½	.07	.06⅜	.06⅞	.06⅜	.06¾	.06¼	.07	.06⅜	.06⅞	.06
Doctor Jack Pot	1	.13¼	.13	.13⅜	.12⅞	.12¾	.12⅝	.12⅝	.12⅜	.12⅛	.12¼	.12¼	.12⅛
Elkton, Con	1	.35⅜	.34	.35½	.34	.34⅜	.34	.34⅛	.33¾	.34½	.33¾	.34⅛	.34
El Paso	1	.71	.70	.72	.70	.71	.69¾	.70¼	.70	.69½	.68½	.67	.66
Fanny Rawlings	1	.05¼	.04	.05½	.04	.04⅞	.04	.04⅜	.04	.05	.04	.05	.04
Gold Dollar Con	1	.04⅞	.04¼	.04⅝	.04⅛	.04⅝	.04¼	.04⅝	.04¼	.04⅝	.04	.04⅝	.04⅜
Golden Fleece	1	.12½	.10	.12¾	.10	.25	.10	.20	.10	.12	.09	.12	.10
Isabella	1	.33	.32	.33	.31¼	.31⅞	.31	.32	.31⅝	.31⅜	.30¼	.31⅞	.31½
Jack Pot	1	.12⅝	.12⅜	.12¾	.12	.12⅜	.12	.12¾	.12¼	.12½	.11¼	.12½	.12
Last Dollar	1	.65	.40	.75	.50	.65	.50	.65	.50	.75	.50	.65	.45
Mollie Gibson	1	.04¾	.05⅛	.05½	.04½	.05⅛	.04⅜	.05	.04¾	.05¼	.04¾	.05¾	.05½
Moon Anchor	1	.09	.07½	.09	.07½	.09	.07½	.08⅛	.07⅛	.08½	.07½	.09	.07½
Pharmacist	1	.05½	.05	.05⅜	.05¼	.05¼	.05	.05¼	.05⅛	.05¾	.05¼	.06	.05
Portland	1	1.95	1.80	2.00	1.80	1.94	1.88	1.96	1.86	1.95	1.88	2.00	1.86
Work	1	.07¾	.07⅝	.07⅞	.07¾	.07¾	.07½	.07⅝	.07⅛	.07⅝	.07¼	.07½	.07

PARIS.

Oct. 9.

Name of Company.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Opening	Prices. Closing.
			Francs.	Fr.	Fr.	Fr.	Fr.
Acieries de Creusot	France	Steel mfrs	27,000,000	2,000	85.00	1,731.00	1,739.00
" " Firminy	"	"	3,000,000	500	200.00	2,575.00	2,600.00
" " Huta-Bank	Russia	Iron and Steel	.....	500	.....	3,615.00	3,575.00
" " la Marine	France	Steel mfrs	20,000,000	500	65.00	1,205.00	1,200.00
Anzin	"	Coal	.....	.....	320.00	5,355.00	5,301.00
Boleo	Lower Cal	Copper	.....	500	176.00	1,151.00	1,151.00
Briansk	Russia	Coal and Iron	.....	500	.....	278.00	258.00
Champ d'Or	S. Africa	Gold	3,375,000	25	3.75	27.00	27.00
Courrieres	France	Coal	600,000	300	90.00	2,610.00	2,450.00
Dombrowa	Russia		.....	500	75.00	980.00	980.00
Dynamite Centrale	France	Explosives	.....	500	19.00	590.00	620.00
Escombrera-Bleyberg	Spain	Lead	.....	500	50.00	750.50	730.00
Fraser River	Brit. Col'mb	Gold	250,000	25	.....	6.00	6.50
Huanchaca	Bolivia	Silver	40,000,000	125	5.00	103.50	101.50
Laurium	Greece	Zinc and Lead	16,300,000	500	25.00	336.50	338.00
Malfidano	Italy	Zinc	12,500,000	500	12.50	472.00	461.00
Metaux, Cie. Fran. de	France	Metal dealers	25,000,000	500	22.50	485.00	476.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	35.00	852.00	858.00
Napthe Baku	Russia	Petroleum	.....	.....	.....	379.50	380.50
Napthe Nobel	"	"	.....	.....	.....	75.00	475.00
" " parts	"	"	.....	.....	.....	9,475.00	9,000.00
Nickel	N. Caled'nia	Nickel	10,000,000	250	20.00	448.50	447.50
Penarroya	Spain	Coal, etc	.....	500	55.00	980.00	972.00
Rebecca	Colo'do, U. S.	Gold	5,000,000	25	.....	1.00	1.00
Salines de l'Est	France	Salt	.....	500	6.00	271.00	277.00
Salines du Midi	"	"	.....	500	40.00	890.00	895.00
Vielle Montagne	Belgium	Zinc	9,000,000	30	30.00	618.00	612.00

ST. LOUIS, MO.* Oct. 27.

Name.	Shares.	Par Val.	Bid.	Ask.
Am.-Nettie, Colo	300,000	$10	$0.65	$0.80
Catherine Lead, Mo.	50,000	10	1.50	3.00
Central Coal & C...	18,750	100	68.00	68 75
Central C. & C., pf..	18,750	100	70.00	71.00
Central Lead, Mo...	10,000	100	130 00	135.00
Columbia Lead, Mo.	50,000	10	12.00	13 00
Con. Coal, Ill	50,000	100	20.00	22.50
Doe Run Lead Co. .	10,000	100	132.00	139.00
Granite Bimet, Mt..	1,000,000	10	1.22	1.35
St. Joe Lead, Mo...	300,000	10	20.00	22.00

*From our Special Correspondent.

TORONTO, ONT. Oct. 27

Name of Company.	par val	High.	Low.	Sales.
Center Star	$1	.41	.35	.....
Fairview	1	.07½	.03	.....
Lone Pine	1	.06	.03½	.....
Mt. Lion	1	.18	.14	.....
North Star	1	.21	.15	.....
Payne	1	.16½	.14	.....
Rambler-Cariboo	1	.75	.40	.....
Republic	1	.10	.06½	2,500
War Eagle Con	1	.20	.16	3,000
White Bear	1	.03½	.03	.....
Winnipeg Develop. Co	1	.05	.04	.....
Can. G. F. S.	1	.04½	.03	1,500

Total sales, 7,000 shares.

LONDON.

Oct. 18.

Name and Country of Company	Authorized Capital.	Par value.	Last dividend. Amt.	Last dividend. Date	Quotations. Buyers.	Quotations. Sellers.
	£	£. s. d.	s. d.		£. s. d.	£ s. d.
Anaconda, c. s., Montana	6,000,000	5 0 0	2 0	Nov., 1902	5 2 6	5 5 0
Arizona, c., Ord	63,444	1 0 0	4 0	July, 1901	7 5 0	7 15 0
Arizona, pref., ord	316,530	1 0 0	4 0	July, 1902	7 10 0	7 15 0
Arizona, Cum., pfd	316,530	1 0 0	£7	Sept., 1902	131	136
Camp Bird, g., Colo	1,000,000	1 0 0	0 7½	Sept., 1902	1 1 6	1 2 6
Copiapo, c., Chile	225,000	2 0 0	2 6	Dec., 1901	1 17 6	2 2 6
De Lamar, g. s., Idaho	80,000	1 0 0	2 0	July, 1902	17 6	1 0 0
Enterprise, g., British Col	200,000	1 0 0			2 6	7 6
El Oro, g Mexico	1,000,000	1 0 0	1 6	June, 1902	1 7 6	1 10 0
Frontino & Bolivia, g., Colombia	140,000	1 0 0	3 0	July, 1901	16 3	1 8 3
Hall Mg. & Sm., c. s., British Col	325,000	1 0 0	1 0	May, 1898	1 0	1 1 6
Le Roi, g., British Col	1,000,000	5 0 0	5 0	Nov., 1899	1 17 6	2 0 0
Le Roi No. 2, g., British Col	120,000	5 0 0	5 0	May, 1902	1 16 3	1 18 9
Montana, g. s., Montana	660,000	1 0 0	6	April, 1899	3 0	3 6
Stratton's Independence, Colorado	1,100,000	1 0 0	6	April, 1902	7 0	8 0
St. John del Rey., g., Brazil	600,000	1 0 0	6	June, 1902	16 0	17 0
Utah Con., g., (High. Boy), Utah	300,000	1 0 0	5 0	Dec., 1901	4 0 0	4 10 0
Ymir, g., British Col	200,000	1 0 0	1 0	Mar., 1902	5 0	10 0
European:						
Linares, l., Spain	45,000	3 0 0	1 2	Oct., 1902	2 5 0	2 15 0
Mason & Barry, c., sul., Port'g'l	185,172	1 0 0	13 0	May, 1902	3 5 0	3 10 0
Rio Tinto, c., Spain	1,625,000	5 0 0	22 6	Oct., 1902	44 0 0	44 5 0
Rio Tinto, pref., Spain	1,625,000	5 0 0	2 6	Oct., 1902	6 0 0	6 5 0
Tharsis, c., Spain	1,250,000	2 0 0	8 0	May, 1902	5 2 6	5 7 6
Australia and New Zealand:						
Assoc. Gold Mines, W. Australia	500,000	1 0 0	1 6	Jan., 1900	1 10 0	1 11 3
Broken Hill Pr'p., s., N. S. Wales	384,000	8 0	1 0	Aug., 1902	1 9 0	1 10 0
Great Bo'd'r Pr'p., W. Australia	175,000	2 0	6	Oct., 1902	18 3	18 9
Hannan's Brownhill, g., W. Australia	155,000	1 0 0	5 0	Aug., 1901	2 7 6	2 8 9
Ivanhoe Gold Corp. W. Australia	1,000,000	5 0 0	3 0	July, 1902	7 6 3	7 8 9
Kalgurlie, g.,W. Australia	120,000	1 0 0	2 6	Oct., 1902	3 8 9	3 13 9
Lake View Cons., g., W. Australia	250,000	1 0 0	5 0	Nov., 1901	2 8 9	2 11 3
Mt. Lyell M. & R. I., c., Tasmania	825,000	3 0 0	1 0	Oct., 1902	2 7 6	2 10 0
Mt. Morgan, g., Queensland	1,000,000	1 0 0	3	Oct., 1902	3 10 0	3 12 6
Waihi, g., New Zealand	497,412	1 0 0	2 6	June, 1902	5 2 6	5 5 0
Indian:						
Champion Reef, g., Colar Fields	236,500	10 0	2 0	Sept., 1902	6 3 9	6 6 3
Mysore Gold, Colar Fields	265,000	10 0	4 0	July, 1902	7 0 0	7 2 6
Nundydroog, g., Colar Fields	242,000	10 0	1 3	July, 1902	1 18 9	2 1 3
Ooregum, g., Colar Fields	171,500	10 0	9	Aug., 1902	2 1 3	2 3 9
Ooregum, pref., g., Colar Fields	120,000	10 0	9	Aug., 1902	2 13 9	2 16 3
African:						
British S. Africa, chartered S. Africa	5,000,000	1 0 0	rts.	May, 1899	3 6 3	3 7 6
Cape Copper, S. Africa	600,000	2 0 0	8 0	Jan., 1902	3 10 0	3 15 0
Cape Copper, pref., S. Africa	150,000	2 0 0	8 0	Jan., 1902	3 7 6	3 12 6
City and Sub'n (New), g., Transvaal	1,360,000	4 0 0	3 0	Aug., 1899	6 10 0	6 15 0
Crown Reef, g., Transvaal	120,000	1 0 0	10 0	Oct., 1902	17 10 0	18 0 0
De Beers Con., d., pref., Cape Colony	1,975,600	2 10 0	15 0	Mar., 1902	19 11 3	19 13 9
De Beers Con., def	2,100,000	2 10 0	12 6	Sept., 1902	22 6 3	22 8 9
Ferreira g., Transvaal	90,000	1 0 0	10 0	Jan., 1902	23 5 0	23 15 0
Geldenhuis Est., g. Transvaal	200,000	1 0 0	5 0	Aug., 1902	6 15 0	6 17 6
Henry Nourse, g., Transvaal	125,000	1 0 0	10 0	June, 1899	9 2 6	9 7 6
Jagersfontein, d., Orange F. S.	1,000,000	5 0 0	6 0	Nov., 1899	26 5 0	26 10 0
Jubilee, g., Transvaal	50,000	1 0 0	5 0	July, 1899	5 10 0	8 0 0
Langlaagte Est., g., Transvaal	470,000	1 0 0	3 0	Sept., 1899	4 0 0	4 2 6
May Con., g., Transvaal	290,000	1 0 0	3 0	Feb., 1902	4 12 6	4 15 0
Meyer & Charlton, g., Transvaal	100,000	1 0 0	3 0	Aug., 1902	5 15 0	6 0 0
Namaqua, c., Cape Colony	200,000	2 0 0	2 0	June, 1899	2 17 6	3 2 6
Primrose (New), g., Transvaal	300,000	1 0 0	6 0	Aug., 1902	3 17 6	4 2 3
Rand Mines, g., S. Africa	448,989	5 0	4 0	Aug., 1902	11 12 6	11 16 0
Robinson, g., Transvaal	2,750,000	5 0 0	7 0	Aug., 1902	11 7 6	11 12 6
Wemmer, Transvaal	80,650	1 0 0	15 0	July, 1902	13 15 0	14 0 0

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

MEXICO.

Oct. 18.

Name of Company	Shares.	Last div'd	Prices. Bid.	Prices. Ask.
Durango:				
Ca. Min. de Penoles	2,500	$50.00	$4,300	$4,500
Guananjuato:				
Angustias, Pozos	2,400	5.00	71	74
Cinco Senores y An., aviadoras	2,000	15.00	270	275
Cinco Senores y An., aviada	400	10.00	255	260
Providencia, San Juan de la Luz	6,000	2.00	215	220
Guerrero:				
Garduno y Anexas	7,200	.....	30	50
Hidalgo:				
Amistad y Concordia	9,000	4.32	64	65
Carmen, aviada	1,100	.....	150	200
Ca. Real del Monte	2,554	.....	450	550
El Encino, aviador	1,120	.....	.....	40
Guadalupe Fresnillo y Annexas	1,000	.....	220	300
La Blanca, aviadora	1,539	.....	750	800
La Blanca, aviada	768	.....	600	600
Maravillas y An., aviador	1,080	.....	180	200
Maravillas el Lobo	1,000	.....	150	200
Palma y An., aviador	1,800	.....	9	12
Sta. Gertrudis y An., aviadas	9,600	.....	7	8
Sta. Gertrudis y An., aviadora	28,800	1.00	78½	79¼
Santo Tomas Apostol aviador	5,100	.....	3	4
San Rafael y An., Trompillo	1,200	12.00	910	920
San Rafael y An., aviada	1,200	4.00	390	400
Soledad, aviada	960	10.00	345	360
Sorpressa, aviada	960	5.00	315	320

Name of Company.	Shares.	Last div'd	Price. Bid.	Price. Ask.
Mexico:				
Alacran	2,400	.....	$30	$40
La Esperanza (El Oro)	3,000	$10.00	750	760
Michoacan:				
Luz de Borda, aviadora	3,000	.....	30	40
Luz de Borda, aviada	1,000	.....	20	25
San Luis Potosi:				
Concepcion y An	3,000	.....	80	90
El Barreno, aviador	2,000	2.00	60	62
Sta. Maria de la Paz	2,400	10.00	770	790
San Diego y Annexas	2,400	4.00	45	50
Zacatecas:				
Candelaria y Pinos	2,500	.....	120	140
San Carlos y Annexas	2,500	10.00	205	195
Sta. Maria de Gaud	2,500	10.00	165	167
Miscellaneous:				
Bartolome de Medina	2,000	1.50	70	75
Guadalupe Hacienda	10,000	2.00	247	275
La Luz Hac. (Pachuca)	3,750	.....	190	200
La Reina (Chihuahua)	192	.....	2,500	3,500
Naica (Chihuahua)	100	.....	6,000	.....
Natividad (Oaxaca) aviador	1,800	4.00	460	500
National (Oaxaca) aviador	1,800	4.00	.....	.....
San Francisco Hac	6,000	1.00	82	85
Santa Ana Huantla Morelos	4,000	.....	50	70
Union Hacienda	3,000	5.00	270	280

SALT LAKE CITY.*

Oct. 23.

Name of Company	Shares.	Par Val	High	Low	Sales.
Ajax	300,000	$10	$.37½	$.36¼	800
Ben Butler	500,000	1	.11	.10⅞	20,000
Bullion-Beck	100,000	10	.....	.....	.....
California	300,000	1	.39	.35½	50,200
Carisa	500,000	1	.21¼	.20	10,600
Century	150,000	1	1.11	1 06	3,300
Con. Mercur	1,000,000	5	1.97½	1.92½	14,100
Daly	150,000	20	2.	1.96	1,100
*Daly-Judge	.....	.....	11.00	10.50	1,180
Daly-West	150,000	20	50.25	49.97½	439
Eagle & B. Bell	250,000	1	.....	.....	.....
Grand Central	250,000	1	5.29	5.29	100
Horn Silver	400,000	25	.....	.....	.....

Name of Company.	Shares.	Par Val	High	Low	Sales.
L. Mammoth	150,000	1	1.66	1.44	8,250
Mammoth	400,000	25	1.81	1.77½	200
May Day	400,000	.25	.29	.25½	23,500
Ontario	150,000	100	8.50	8.50	100
Sacramento	1,000,000	5	.....	.....	.....
Star Con	500,000	1	.22	.17	20,700
Swansea	100,000	5	.86	.79	200
So. Swansea	300,000	1	.19	.19	100
Sunshine	250,000	10	.17¾	.16¾	2,000
Uncle Sam, Con	500,000	1	.32¼	.31	10,900
Victor	500,000	1	.20	.17	9,800
West Mg. Glory	500,000	.10	.....	.....	.....
Yankee Con	500,000	1	.....	.....	.....

All mines are in Utah. *By our Special Correspondent. Total sales, 178,049 shares.

DIVIDENDS.

GOLD, SILVER, COPPER, LEAD, QUICKSILVER AND ZINC COMPANIES.

Name of Company	Location	Authorized Capital Stock	Shares Issued	Par Val	Dividends Paid 1902	Total to Date	Latest Date	Latest Amt.
Aberdeen, c.	N. M.	$1,000,000	32,175	$25		$32,175	Nov 1901	$1.00
Adams, s. l. c	Colo.	1,500,000	150,000	10	$22,500	738,500	Oct. 1902	.05
Aetna Con., q.	Cal	500,000	100,000	5		225,000	Apr. 1900	.15
Alaska-Mexican, g.	Alaska.	1,000,000	180,000	5		465,381	Oct. 1900	.10
Alaska-Treadwell, g.	Alaska.	5,000,000	200,000	25	300,000	5 120,000	Oct. 1902	.37½
Amalgamated, c.	Mont.	155,000,000	1,538,879	100	3,847,196	19,656,687	Nov. 1902	.50
Am. Sm. & Ref., pf	U. S.	50,000,000	500,000	100	3,500,000	8,891,553	Oct. 1902	1.75
Anaconda, c.	Mont.	30,000,000	1,200,000	25	1,200,000	22,050,000	Nov 1902	.50
Annie Laurie, g.	Utah	2,000,000	20,000	100	20,000	20,000	Oct. 1902	1.00
Arizona, c.	Ariz.	3,775,000			1,114,799	3,445,468	Sept. 1902	..
Atlantic, c.	Mich	1,000,000	40,000	25		940,000	Feb. 1901	2.00
Bald Butte, g. s	Mont.	250,000	250,000	1	150,000	1,267,148	Oct. 1902	.06
Boston, q	Cal	1,000,000	100,000	10		20,000	Jan. 1900	.10
Boston & Colo Sm.	Colo.	750,000	15,000	50	45,000	402,350	Oct. 1902	.75
Boston Gold-Copper Sm	Colo.	1,000,000	1,000,000	1		150,000	Nov 1901	.02½
Boston-Little Circle, z. l.	Mo	100,000	100,000	1		112,500	Oct. 1901	.25
Boston & Mont. Con., c. s. g.	Mont.	3,750,000	150,000	25	900,000	27,125,000	Oct. 1902	2.00
Breece, l. s.	Colo.	5,900,000	200,000	25	20,000	190,000	Sept. 1902	.05
Buffalo Hump, g.	Idaho	1,000,000	100,000	10		300,000	Jan. 1901	.10
Bullion-Beck & Champion	Utah	1,000,000	100,000	10		2,498,400	June 1900	.10
Bunker Hill & Sullivan	Idaho	3,000,000	300,000	10	147,000	1,433,000	Nov 1902	.03
Butte & Boston, c.	Mont.	2,000,000	200,000	10		1,600,000	Nov. 1901	3.00
Butterfly-Terrible, g.	Colo.	1,500,000	1,250,000	1		31,250	Oct. 1901	.00½
Calumet & Hecla, c.	Mich	2,500,000	100,000	25	2,000,000	79,350,000	Aug 1902	5.00
Camp Bird, g.	Colo.	5,000,000	738,000	5	110,700	110,700	Sept. 1902	.15
Carisa g. s. c.	Utah	500,000	500,000	1		30,000	Nov. 1901	.03
Centennial Eureka, g. s. l. c.	Utah	5,000,000	100,000	25	50,000	2,667,700	Jan. 1902	.50
Center Creek, l. z.	Mo	1,000,000	100,000	10	10,000	80,000	Mar. 1902	.10
Central Eureka, g.	Cal	4,000,000	398,425	10	7,968	23,718	Sept. 1902	.02
Central, l.	Mo	1,000,000	10,000	100	50,000	315,000	Oct. 1902	.50
Cherry Hill, g.	Cal	1,000,000	1,000,000	1	25,000	57,560	Oct. 1902	.00¼
Chippewa Con., g. s. l	Colo.	250,000	250,000	1	1,250	1,250	June 1902	.00½
Con. Cal. & Va., s. g.	Nev	540,000	216,000	2½		3,963,600	July 1901	.10
Con. Mercur, g.	Utah	5,000,000	1,000,000	5	365,000	820,000	Nov 1902	.03
Continental, z.	Mo	550,000	22,000	25	17,600	17,600	Oct. 1902	.40
Cripple Creek, g pf.	Colo.	125,000	125,000	1	5,000	45,000	Jan. 1902	.04
Croesus, g.	Cal	1,000,000	200,000	5		227,300	Aug. 1901	.05
Crowned King g. s.	Ariz.	6,000,000	600,000	10		242,760	May 1901	.02
Dalton & Lark, g. s. l.	Utah	2,500,000	2,500,000	1		350,000	July 1901	.10½
Daly West	Utah	3,600,000	180,000	20	648,000	2,043,000	Oct. 1902	.60
De Lamar (New), g. s.	Idaho	400,000	67,181	5	131,368	129,666	Oct. 1902	.48
Doctor-Jack Pot Con., g.	Colo.	3,000,000	2,900,000	1		232,000	Aug. 1901	.01
Doe Run, l.	Mo	1,500,000	10,000	100	60,000	537,072	Oct. 1902	1.50
Ducktown c. i. sul. (Ord)	Tenn	374,000	74,800	5		165,250	Dec. 1901	.25
Ducktown (Fndr)	Tenn	1,000	200	5		75,250	May 1901	75.00
Elkton Con., g.	Colo.	3,000,000	2,500,000	1	100,000	1,404,461	Mar. 1902	.04
Empire State-Idaho, l. s.	Idaho	6,000,000	505,542	10	253,170	1,511,108	Oct. 1902	.05
Ferris-Haggarty, c.	Wyo.	1,000,000	1,000,000	1		15,000	Sept. 1901	.01
Florence, s.	Mont.	2,500,000	400,000	5		223,780	Mar. 1900	.05
Gemini	Utah	500,000	5,000	100	150,000	850,000	Oct. 1902	20.00
Gold Coin of Victor, g.	Colo.	1,000,000	1,000,000	1	240,000	1,200,000	Oct. 1902	.01
Gold King, g.	Colo.	1,000,000	936,850	1		412,214	July 1901	.03
Golden Cycle, g.	Colo.	2,000,000	1,500,000	1	33,750	33,750	Oct. 1902	.00¾
Golden Eagle, g.	Colo.	500,000	489,015	1		98,916	Sept. 1901	.01
Grand Central, g.	Utah	250,000	250,000	1		691,250	Nov 1900	.10
Gwin, g.	Cal	1,000,000	100,000	10	160,000	421,560	Oct. 1902	.15
Hecla, l. s.	Idaho	250,000	1,000,000	¼		100,000	Dec. 1900	.02
Hecla Con., s. l.	Mont.	1,500,000	30,000	50		2,250,000	July 1901	.50
Helena Con., g.	Ore.	1,500,000	1,300,000	1	129,500	248,090	Oct. 1902	.01½
Hidden Treasure, g.	Cal	360,000	36,000	10		457,452	Sept. 1900	.10
Holy Terror, g.	S. D.	500,000	500,000	1		172,000	Jan. 1900	.01
Homestake, g.	S. D.	21,840,000	218,400	100	949,200	11,602,950	Oct. 1902	.25
Horn Silver, g. s. c. z. l.	Utah	10,000,000	400,000	25		5,342,000	Dec. 1901	.10
Independence Con., g.	Colo.	2,500,000	2,500,000	1		281,375	Apr. 1901	.04
Ingham Con., g.	Colo.	750,000	1,359,600	½		33,981	Aug. 1901	.00¼
Iowa, g. s. l.	Colo.	1,666,667	1,666,667	1	66,668	270,169	Oct. 1902	.01
Iron Silver	Colo.	10,000,000	500,000	20		2,550,000	Dec. 1900	.10
Isabella, g.	Colo.	2,250,000	2,250,000	1		742,500	Mar. 1901	.01
Jamison g.	Cal	3,900,000	390,000	10		62,400	Sept. 1901	.03
Katinka, g	Colo.	1,000,000	1,000,000	1		10,000	Nov 1901	.01
Kendrick & Gelder Sm	Colo.	1,000,000	1,000,000	1		20,000	Dec. 1901	.01
Kennedy, g.	Cal	10,000,000	100,000	100		1,801,000	June 1901	.05
La Fortuna, g.	Ariz.	250,000	250,000	1	137,500	1,213,500	Oct. 1902	.05
Last Dollar, g.	Colo.	1,500,000	1,500,000	1		180,000	Dec. 1901	.02
Lightner, g	Cal	125,000	102,255	1	5,113	33,230	July 1902	.05
Lillie, g.	Colo.	1,250,000	250,000	5		349,183	Apr. 1900	.05
Mammoth, g. s. c.	Utah	10,000,000	400,000	25		1,860,000	July 1901	.05
Mary McKinney, g.	Colo.	1,000,000	1,000,000	1	120,000	470,000	Oct. 1902	.03
May Day, g.	Utah	100,000	400,000	¼	12,000	30,000	Mar. 1902	.01
Midget, g.	Colo.	1,000,000	1,000,000	1	30,000	195,000	Apr. 1902	.15
Modoc, g. s.	Colo.	500,000	500,000	1	30,000	270,000	Oct. 1902	.01
Mont. Ore Purchasing	Mont.	2,500,000	81,000	25	324,000	2,646,000	Sept. 1902	2.00
Monument, g.	Colo.	300,000	300,000	1		21,124	Feb. 1901	.01
Morning Star Drift, g	Cal	240,000	2,400	100		854,400	Sept. 1900	3.00
Mountain, c.	Cal	6,250,000	250,000	25	300,000	3,393,750	Apr. 1902	1.20
Mt. Diablo, s.	Nev.	5,000,000	50,000	100		260,271	Jan. 1900	.10
Napa Con., q.	Cal	700,000	100,000	7	40,000	1,180,000	Oct. 1902	.10
National Lead, com.	U. S.	15,000,000	149,054	100		1,341,486	Mar. 1900	1.00
National Lead, pfd	U. S.	15,000,000	149,040	100	782,484	12,666,044	Sept. 1902	1.75
New Idria, q.	Cal	5,000,000	100,000	5	80,000	400,000	Oct. 1902	.30
New Jersey, z.	U. S.	10,000,000	100,000	100	700,000	3,900,000	Feb. 1902	7.00
New Leadville Home, g.	Colo.	2,000,000	2,000,000	1	25,000	265,500	Feb. 1902	.00⅝
Nugget, g.	Colo.	1,000,000	991,000	1		84,730	July 1901	.01
Old Colony Zinc & Sm	Mo	1,000,000	69,909	10		138,184	Nov 1901	.25
Ontario, s. l.	Utah	15,000,000	150,000	100	180,000	14,917,000	Dec. 1902	.30
Osceola, c.	Mich	2,500,000	96,150	25		4,247,300	Dec. 1901	3.00
Parrot, c.	Mont.	2,300,000	229,850	10	114,925	5,772,925	Jan. 1902	.50
Penn. Con., g.	Cal	5,150,000	51,500	100		161,325	May 1900	.10
Plumas Eureka, g.	Cal	1,406,250	150,625	10		2,831,294	Apr. 1901	.24
Pointer, g	Colo.	1,250,000	1,250,000	1		25,000	June 1901	.01
Portland, g.	Colo.	3,000,000	3,000,000	1	270,000	4,297,080	Oct. 1902	.03
Pride of the West	Ariz.	1,500,000	150,000	10	15,000	15,000	Oct. 1902	.10
Quicksilver, pfd.	Cal	4,300,000	43,000	100	21,500	1,909,911	May 1902	.50
Quincy, c.	Mich	2,500,000	100,000	25	700,000	13,570,000	Aug. 1902	3.00
Richmond, g. s. l.	Nev.	1,350,000	54,000	25		4,453,797	Dec. 1900	.24
Rob Roy, z.	Mo	15,000	12,200	1	366	366	Oct. 1902	.03
Rocco-Homestake, g. s.	Nev.	300,000	300,000	1	22,500	76,500	May 1902	.01½
Sacramento, g.	Utah	5,000,000	1,000,000	5		133,000	Aug. 1901	.00½
St. Joseph, l.	Mo	3,000,000	250,000	10	112,500	3,572,000	Sept 1902	.15
Silver Hill, g. s.	Nev.	180,000	180,000		5,400	5,400	Sept. 1902	.05
Silver King, g. s. l.	Utah	3,000,000	150,000	20	1,000,000	5,750,000	Oct. 1902	.66⅔
Smuggler, s. l. z.	Colo.	1,000,000	1,000,000	1	20,000	2,175,000	Feb. 1902	.01
Southern Boy, g.	Colo.	1,250,000	875,000	1		17,500	May 1900	.02
South Swansea, s. l	Utah	300,000	275,000	1		167,500	Mar. 1901	.05
South Winnie, g. s.	Colo.	250,000	250,000	1		15,000	Sept 1901	.01
Standard Con., g. s.	Cal	2,000,000	178,394	10	53,517	4,088,975	Aug. 1902	.10
Standard, s. l.	Idaho	500,000	500,000	1	100,000	2,565,000	Apr. 1902	.05
Stratton's Independence, g.	Colo.	5,500,000	1,000,007	5	240,000	3,770,860	Apr. 1902	.12
Strong, g.	Colo.	1,000,000	1,000,000	1	325,000	2,225,000	Oct. 1902	.02½
Swansea, s. l.	Utah	500,000	100,000	5		330,500	June 1901	.05
Syndicate, g.	Cal	100,000	100,900	1	2,000	82,000	Aug. 1902	.02
Tamarack, c.	Mich	1,500,000	60,000	25		8,490,000	Dec. 1901	10.00
Tomboy (New), g. s.	Colo.	1,500,000	300,000	5	72,000	404,000	July 1902	.24
Town Topics, g. c.	Colo.	1,000,000	1,000,000	1	15,000	30,000	Sept. 1902	.00½
Uncle Sam Con	Utah	500,000	500,000	1		45,000	Nov. 1901	.03
Union, g.	Colo.	1,250,000	1,250,000	1	25,000	445,244	Jan. 1902	.02
Union, z. l.	Kas.	500,000	300,000	1		16,000	July 1901	.01
United, c, pf.	Mont.	5,000,000	50,000	100	150,000	150,000	Nov 1902	3.00
United, g.	Colo.	5,000,500	3,994,769	1	199,846	199,846	Oct. 1902	.01
United, z. l., com	Mo	5,000,000	78,990	5	15,197	15,197	Oct. 1902	.05
United, z. l., pfd.	Mo	1,000,000	18,998	25	31,996	92,055	Oct. 1902	.50
United Verde, c	Ariz.	3,000,000	300,000	10		10,785,322	Dec. 1901	.75
U. S. Red. & Ref., com	Colo.	6,000,000	59,188	100	177,226	177,226	Oct 1902	1.00
U. S. Red. & Ref., pf	Colo.	4,000,000	39,458	100	236,073	236,073	Oct. 1902	1.50
Utah, g	Utah	1,000,000	100,000	10	8,000	203,000	Oct. 1902	.02
Utah Con., c.	Utah	1,500,000	300,000	5	2,000	734,000	Sept. 1902	.01
Vindicator Con., g.	Colo.	1,500,000	1,100,000	1	253,000	917,000	Oct. 1902	.05
White Rock, g.	Utah	500,060	200,000	2½	2,000	2,000	Aug. 1902	.01
Wolverine, c.	Mich	1,500,000	60,000	25	240,000	990,000	Oct. 1902	2.00
Yankee Con., g. s. l.	Utah	500,000	500,000	1	75,000	75,000	Apr. 1902	.05
Yellow Aster, g.	Cal	1,000,000	100,000	10	20,000	463,789	Oct. 1902	.10

COAL, IRON AND INDUSTRIALS.

Name of Company	Location	Authorized Capital Stock	Shares Issued	Par Val	Dividends Paid 1902	Total to Date	Latest Date	Latest Amt.
Ala. Con., Coal & Iron, pfd	Ala.	$2,500,000	$25,000	$100	$91,250	$525,000	Sept. 1902	$1.75
Allis-Chalmers, pfd.	U. S.	25,000,000	162,500	100	1,137,500	1,706,250	Nov. 1902	1.75
Altoona Coal & Coke	Pa.	2,500,000	250,000	10		75,000	Jan. 1901	.30
Americen Agr. Chem., pfd.	U. S.	20,000,000	181,350	100	1,028,100	3,582,690	Oct. 1902	3.00
American Cement	Pa	2,100,000	200,000	10	160,000	380,000	July 1902	.40
American Coal	Md.	1,500,000	60,000	25	150,000	1,282,500	Sept. 1902	1.25
American Iron & Steel, com.	Pa	17 000,000	34,000	50	10,200	256,100	May 1902	.15
American Iron & Steel, pfd.	Pa	3,000,000	60,000	50	150,000	450,000	Oct. 1902	.62½
Aztec Oil	Cal.	250,000	235,000	1	16,450	16,450	Aug. 1902	.03
Bethlehem Steel	Pa	15,000,000	300,000	50		1,325,000	Sept. 1901	.25
California Oil & Gas	Cal.	2,000,000	200,000	10		540,000	Sept. 1901	.70
Cambria Steel (New)	Pa	50,000,000	900,000	50	1,350,000	1,350,000	Aug. 1902	.75
Central Coal & Coke, com	Mo	1,875,000	18,750	100	56,250	146,250	Oct. 1902	1.50
Central Coal & Coke, pfd	Mo	1,875,000	18,750	100	84,374	703,124	Oct. 1902	1.25
Central Oil	W. Va.	1,500,000	60,000	25	45,000	112,500	Aug. 1902	.25
Central Oil	Cal.	1,000,000	800,000	1	24,000	160,247	Jan. 1902	.03
Central Point Con. Oil	Cal.	200,000	190,000	1		45,600	Dec. 1901	.02
Colorado Fuel & Iron, com	Colo.	38,000,000	239,310	100	805,000	1,642,500	Apr. 1902	1.75
Colorado Fuel & Iron, pfd	Colo.	2,000,000	20,00	100	160,000	1,480,000	Aug. 1902	4.00
Consolidation Coal	Md.	10,250,000	102,500	100	205,000	5,523,000	Feb. 1902	2.00
Consolidated Coal	Ill.	5,000,000	50,000	100	50,000	160,000	Jan. 1902	1.00
Continental Oil	Cal.	300,000	260,000	1		10,400	July 1901	.01
Crucible Steel, pfd	U. S.	25,000,000	250,000	100	1,750,000	3,500,000	Sept 1902	1.75
Dabney Oil	Cal.	1,000,000	1,000,000	1		10,000	May 1901	.01
Empire Steel & Iron, pfd	U. S.	5,000,000	23,700	100	71,042	319,892	July 1902	1.50
Federal Chem., pfd	Ky.	1,500,000	15,000	100	67,500	67,500	July 1902	1.50
Four Oil	Cal.	300,000	208,700	1	14,609	22,957	Oct. 1902	.01
General Chem., com.	U. S.	12,500,000	74,103	100	222,261	855,918	Sept. 1902	1.00
General Chem., pfd.	U. S.	12,500,000	94,166	100	564,960	1,975,178	Oct. 1902	1.50
Gray Eagle Oil	Cal.	250,000	100,000	2½		217,000	May 1901	.47
Hanford Oil	Cal.	20,000	2,000	10	7,000	13,000	Sept 1902	1.50
Heywood Oil	Tex.	800,000	800,000	1		32,000	Nov. 1901	.04
Higgins Oil	Tex.	2,560,000	17,609	100	96,850	96,850	Apr. 1902	1.50
Home Oil	Cal.	100,000	100,000	1	75,000	435,000	Oct 1902	.07½
Homestake Oil	Cal.	100,000	10,006	10	1,500	33,000	Aug. 1902	.15
Houston Oil, pfd.	Tex.	7,500,000	75,000	100	448,250	672,375	Aug. 1902	3.00
Imperial Oil	Cal.	1,000,000	100,000	100	240,000	240,000	Nov 1902	.20
Int'l Acheson Graphite, pfd.	N. Y.	500,000	5,000	100	17,500	52,500	Feb. 1902	3.50
Jeff. & Clearf., Coal & Iron, com.	Pa	1,500,000	15,000	100	75,000	105,000	Aug. 1902	5.00
Jeff. & Clearf., Coal & Iron, pfd.	Pa	1,500,000	15,000	100	75,000	525,500	Aug. 1902	2.50
Kern River Oil	Cal.	100,000	20,060	5	20,000	60,000	Aug. 1902	1.00
Lehigh Coal & Nav	Pa.	14,346,650	286,933	50	430,399	19,808,187	May 1902	.50
Maryland Coal, pfd.	Md.	2,000,000	18,850	100	47,125	791,669	July 1902	2.50
Monongahela R. Coal, pfd.	Pa.	10,000,000	98,300	50	1,388,520	2,430,015	Oct. 1902	1.75
Montana Coal & Coke	Mont	5,000,000	200,000	25		120,000	Oct. 1900	.03
National Salt, com.	U. S.	7,000,000	70,000	100		615,000	Nov 1901	1.50
National Salt, pfd.	U. S.	5,000,000	50,000	100		875,000	Nov 1901	1.75
New Central Coal	Md.	1,000,000	50,000	20		510,000	Apr 1900	.40
Ohio & Indiana Natural Gas	U. S.	10,000,000	90,000	100	270,000	590,000	Sept. 1902	1.00
Oil City Petroleum	Cal.	500,000	500,000	1		15,000	Nov 1901	.02½
Pacific Coast Borax	Cal.	2,000,000	19,000	100	190,000	1,179,550	Oct. 1902	1.00
Peerless Oil	Cal.	1,000,000	92,000	10	46,920	46,920	Dec. 1902	.08
Pennsylvania Salt Mfg	Pa.	5,000,000	100,000	50	300,000	13,150,000	Sept. 1902	3.00
Penna. Steel, pfd	Pa.	25,000,000	165,000	100	825,000	1,402,500	Nov 1902	3.50
Petroleum Dev.	Cal.	125,000	125,000	1	25,000	25,000	Mar. 1902	.20
Philadelphia Gas, com	Pa	16,102,131	308,542	50	905,378	2,491,207	Oct. 1902	.75
Philadelphia Gas, pfd.	Pa	3,998,350	79,967	50	299,877	699,713	Sept. 1902	1.25
Pittsburg Coal, pfd.	Pa.	32,000,000	297,012	100	2,240,000	6,398,168	Oct. 1902	1.75
Producers' & Con. Oil	Cal.	1,000,000	10,000	100		56,500	Mar. 1901	.10
Rep. Iron & Steel, pfd.	U. S.	25,000,000	203,569	100	1,421,484	4,619,822	Oct. 1902	1.75
Retsof Salt	N. Y.	5,000,000	36,030	100	144,000	576,000	Oct. 1902	1.00
San Joaquin Oil	Cal.	100,000	100,000	1	35,000	60,000	Oct. 1902	.05
Shawmut Oil	W. Va.	1,250,000	50,000	25	25,000	125,000	Aug. 1902	.50
Shelby Iron	Ala.	1,000,000	10,000	100	160,000	690,000	Nov 1902	6.00
Sloss-Sheffield Steel & Iron, pfd.	Ala.	20,000,000	67,000	100	351,750	1,159,500	July 1902	1.75
So. Cal. Oil & Fuel	Cal.	300,000	200,000	1		39,000	Nov. 1901	.01½
Standard Oil (of N. J.)	U. S.	100,000,000	970,000	100	33,950,000	54,335,000	Sept. 1902	5.00
Sunday Lake Iron	Mich	1,000,000	40,000	25		40,000	Feb. 1901	1.00
Susquehanna I. & S., pfd	Pa	1,500,000	300,000	5	90,000	672,500	July 1902	.15
Temple Iron	Pa	240,000	2,400	100	7,200	7,200	Jan. 1902	3.00
Tenn. C. I. & R. R., com	Tenn	23,000,000	225,536	100		1,102,144	Nov. 1900	2.00
Tenn. C. I. & R. R., pfd	Tenn	248,000	2,480	100	14,880	277,760	Aug. 1902	2.00
Tex. & Pacific Coal	Tex.	2,000,000	20,000	100	120,000	2,040,000	Oct. 1902	1.50
Thirty-three Oil	Cal.	500,000	100,000	5	110,000	110,000	Nov 1902	.10
Thomas Iron	Pa	2,500,000	25,000	100	200,000	200,000	Aug. 1902	4.00
Union Oil	Cal.	10,000,000	52,672	100	179,084	297,595	July 1902	.70
U. S. Crude Oil	Cal.	100,000	100,000	1		27,220	Dec. 1901	.02
U. S. Marble	Wash.	2,000,000	2,000,000	1	15,000	53,750	Jan. 1902	.00¾
U. S. Steel Corp., com	U. S.	550,000,000	5,083,222	100	20,332,887	34,520,994	Dec. 1902	1.00
U. S. Steel Corp., pfd.	U. S.	550,000,000	5,103,147	100	35,920,755	53,745,626	Nov 1902	1.75
Va.-Carolina Chem., com	U. S.	38,000,000	279,844	100	979,454	2,629,454	Sept. 1902	1.25
Va.-Carolina Chem., pfd	U. S.	12,000,000	120,000	100	960,000	6,060,000	Oct. 1902	2.00
Ventura Con. Oil	Cal.	1,000,000	1,000,000	1	5,000	5,000	Feb. 1902	.00½
Victoria Coal & Coke, com	W. Va.	150,000	1,500	100		15,000	Jan. 1901	10.00
Victoria Coal & Coke, pfd	W. Va.	100,000	1,000	100	6,000	15,000	July 1902	3.00
Warner Oil	Cal.	200,000	200,000	1		10,000	June 1901	.01
Westmoreland Coal	Pa	5,000,000	250,000	50	750,000	7,500,000	Sept. 1902	1.50
West Shore Oil	Cal.	100,000	100,000	1	20,000	40,000	Oct. 1902	.05

CANADA, CENTRAL AND SOUTH AMERICA, MEXICO.

Name of Company	Location	Authorized Capital Stock	Shares Issued	Par Val	Dividends Paid 1902	Total to Date	Latest Date	Latest Amt.
Amistad y Concordia	Mex.	$480,000	9,000	$50	$50,564	$66,574	July 1902	$1.78
Bartolome de Medina Mill	Mex.	50,000	2,000	25	17,533	61,083	Oct. 1902	.60
Bosun, s. l.	B. C.	250,000	50,000	5		12,500	Apr 1901	.25
Cariboo McKinney, g.	B. C.	1,250,000	1,250,000	1	18,750	496,837	Mar 1902	.01½
Center Star, g.	B. C.	3,500 000	3,500,000	1		210,000	May 1901	.01
Cinco Senores	Mex.		2,000		41,105	641,105	Oct. 1902	4.00
Copiapo, c.	Chile	1,125,000	112,500	10		2,826,000	Dec. 1901	.60
El Oro, g. s.	Mex.	5,000,000	980,000	5	367,560	1,548,000	June 1902	.36
Esperanza, s. g.	Mex.	150,000	3,000	50	126,590	1,047,279	Oct. 1902	4.08
Frontino & Bolivia c.	Colom.	643,310	128,662	5		1,211,703	July 1901	.72
Goodenough, s. l.	B. C.	800,000	659,400	1	6,594	13,188	Jan. 1902	.01
Grand Central, g. s.	Mex.	1,500,000	250,000	5		840,000	Jan. 1900	.48
Guadalupe Mill	Mex.	1,000,000	10,000	100	133,406	3,515,350	Oct. 1902	2.00
Greene Con., c	Mex.	6,000,000	600,000	10		220,000	Sept. 1901	.20
Le Roi No. 2, g.	B. C.	3,000,000	120,000	25	144,000	288,000	May 1902	1.20
Mesquital	Mex.	125,000	250,000	½		36,458	July 1901	.08
Natividad, s. g.	Mex.	36,000	2,400	15	40,390	156,546	Oct. 1902	1.60
N. Y. & Hond. Rosario, s. g.	C. A.	1,500,000	150,000	10	135,000	1,805,000	Sept. 1902	.10
North Star, s. l.	B. C.	1,500,000	1,300,000	1	58,500	312,000	Sept. 1902	.01½
Nova Scotia St. & Coal, com.	N. S.	5,000,000	50,000	100	123,600	123,600	Apr. 1902	4.00
Nova Scotia St. & Coal, pfd.	N. S.	2,000,000	10,300	100	20,600	61,800	Apr. 1902	2.00
Payne Con., s. l.	B. C.	3,000,000	2,600,000	1		1,438,000	Jan. 1901	.03
Penoles (Map.), s. l.	Mex.	125,000	2,500	50	1,027,739	1,878,289	Oct. 1902	20.00
Providencia (S. J.)	Mex.	90,000	6,000	15	50,826	150,900	Oct 1902	.82
Rambler-Cariboo, s. l.	B. C.	1,250,000	1,250,000	1	125,000	215,000	Oct. 1902	.01
Reco, s. l.	B. C.	1,000,000	1,000,000	1		278,500	Aug. 1900	.10
St. John del Rey, g.	Brazil	3,000,000	534,868	5	70,760	13,935,235	June 1902	.12
San Carlos Minillas	Mex.	12,500	2,500	5	22,150	234,329	Feb. 1902	4.43
Soledad, s. l.	Mex.	19,200	960	20	19,873	216,673	Oct 1902	4.08
Sorpressa	Mex.	19,200	960	20		185,653	July 1901	2.18
Sta. Maria de Guadalupe	Mex.	2,500	2,500	1	85,313	377,918	Sept. 1902	4.08
Sta. Maria de la Paz	Mex.		2,400		87,153	1,812,753	Aug. 1902	4.13
San Diego de Char	Mex.	96,000	2,400	40		61,100	Nov. 1901	.83
San Francisco Mill	Mex.	50,000	6,060	25	56,610	282,360	Oct. 1902	.40
Sta. Gertrudis	Mex.	1,920,000	38,400	50	74,104	2,624,344	Oct. 1902	
San Rafael	Mex.	60,000	2,400	25	39,610	1,759,508	Oct. 1902	
St. Eugene Con., s. l.	B. C.	3,500,000	3,500,000	1		210,000	Apr 1901	.03
Union Mill	Mex.	150,000	3,000	50	25,650	378,270	Oct. 1902	2.00
War Eagle Con., g. s. c.	B. C.	2,000,000	1,750,000	1		545,250	Feb. 1900	.01½
Ymir, g.	B. C.	1,000,000	200,000	5	48,000	288,000	Mar 1902	.24

CHEMICALS, MINERALS, RARE EARTHS, ETC.—CURRENT WHOLESALE PRICES.

(See also Market Reviews.)

ABRASIVES—	Cust.Meas.	Price.
Carborundum, f.o.b. Niagara Falls, Powd., F.FF.FFF.	lb.	$0.08
Grains	"	.10
Corundum, N. C.	"	.07@.10
Chester, Mass.	"	.04½@.05
Barry's Bay, Ont.		.07½@09½
Crushed Steel, f.o.b Pittsburg	"	.05½
Emery, Turkish flour in kegs	"	.03½
Grains, in kegs	"	.05@.05½
Naxos flour, in kegs.	"	.03½
Grains, in kegs.	"	.05@.05½
Chester flour, in kegs.	"	.03½
Grains, in kegs.	"	.05@.05½
Peekskill, f.o.b. Easton, Pa., flour, in kegs.	"	.01½
Grains, in kegs.	"	.02½
Crude, ex-ship N. Y.: Abbott (Turkey)	lg.ton	26.50@30.00
Kuluk (Turkey)	"	22.00@24.00
Naxos (Greek) h. gr.	"	26.00
Garnet, as per quality	sh.ton	25.00@35.00
Pumice Stone, Am. powd.	lb.	.01⅝@.02
Italian, powdered.	"	.01½
Lump, per quality	"	.04@.40
Rottenstone, ground	"	.02½@.04½
Lump, per quality	"	.06@.20
Rouge, per quality	"	.10@.30
Steel Emery, f.o.b. Pittsburg.	"	.07
ACIDS—		
Boracic, crystals	"	.10¾@.11
Powdered	"	.11¼@.11½
Carbonic, liquid gas		.12½
Chromic, crude.		.20
Hydrofluoric, 30%	"	.03
48%	"	.05
60%	"	.11
Sulphurous, liquid anhy.	"	.05
ALCOHOL—Grain	gal.	2.47
Refined wood 95@97%	"	.60@.65
Purified	"	1.20@1.50
ALUM—Lump	100 lbs.	1.75
Ground	"	1.80
Powdered	"	3.00
Chrome, com'l	"	2.75@3.00
ALUMINUM—		
Nitrate	lb.	1.50
Oxide, com'l, common	"	.06½
Best	"	.20
Pure	"	.80
Hydrated	100 lbs.	2.60
Sulphate, pure	"	1.50@2.00
Com'l	"	1.15@2.00
AMMONIA—		
Aqua, 16°	lb.	.03
18°	"	.03¼
20°	"	.03¾
26°	"	.05½
AMMONIUM—		
Carbonate, lump	"	.08¼
Powdered	"	.09
Muriatic, grain	"	.05⅝
Lump	"	.08¼
Nitrate, white, pure (99%).	"	.12
Phosphate, com'l	"	.09
Pure	"	.12
ANTIMONY—Glass	"	.30@.40
Needle, lump	"	.05½@.06
Powdered, ordinary	"	.05¾@.07¼
Oxide, com'l white, 95%	"	.09½
Com'l white, 95%	"	.12
Com'l gray	"	.07
Sulphuret, com'l	"	.16
ARSENIC—White	"	.02¾@.03⅛
Red	"	.06¾@.07
ASPHALTUM—		
Ventura, Cal.	sh.ton	32.00
Cuban	lb.	.01½@.03½
Egyptian, crude.	"	.05½@.06
Trinidad, refined.	sh.ton	35.00
San Valentino (Italian)	lg.ton	16.00
Seyssel (French), mastic	sh.ton	21.00
Gilsonite, Utah, ordinary	lb.	.03
Select	"	.03¾
BARIUM—		
Carb. Lump, 80@90%	sh.ton	25.00@27.50
92@98%	"	26.00@29.00
Powdered, 80@90%.	lb.	.01¾@.02
Chloride, com'l	100lbs.	1.67½@1.76
Chem. pure cryst.	lb.	.05
Nitrate, powdered	"	.05⅛

BARIUM	Cust.Meas.	Price.
Oxide, Am. hyd. cryst.	lb.	$0.02¾
Sulphate (Blanc Fixe)	"	.02
BARYTES—		
Am. Crude, No. 1	sh. ton	9.00
Crude, No. 2	"	8.00
Crude, No. 3	"	7.75
German, gray	"	14.50
Snow white	"	17.00
BAUXITE—Ga. or Ala. Mines:		
First Grade	lg.ton	5.50
Second grade	"	4.75
BISMUTH—Subnitrate	lb.	1.40
Subcarbonate	"	1.65
BITUMEN—"B"	"	.03½
"A"	"	.05
BONE ASH	"	.02¼@.02½
BORAX	"	.07¼@.07½
BROMINE	"	.40
CADMIUM—Metallic	"	1.40
Sulphate	100 lbs.	2.00@2.50
CALCIUM—Acetate, gray	"	1.30
" brown	"	.90
Carbide, ton lots f.o.b. Niagara Falls, N. Y., for Jeresy City, N. J.	sh.ton	70.00
Carbonate, ppt.	lb.	.05
Chloride	100 lbs.	.70@.90
CEMENT—		
Portland, Am., 400 lbs.	bbl.	1.70@1.90
Foreign	"	1.65@2.25
"Rosendale," 300 lbs.	"	.75
Slag cement, imported	"	1.65
CERESINE—		
Orange and Yellow	lb.	.12
White	"	.13½
CHALK—Lump, bulk	sh.ton	2.50
Ppt. per quality	lb.	.03¾@.06
CHLORINE—Liquid	"	.30
Water	"	.10
CHROME ORE—		
(50% ch.) ex-ship N. Y.	lg.ton	24.75
Bricks f.o.b. Pittsburg	M	175.00
CLAY, CHINA—Am. com., ex-dock, N. Y.	lg.ton	8.00
Am. best, ex-dock, N. Y.	"	9.00
English, common	"	12.00
Best grade	"	17.00
Fire Clay, ordinary	sh.ton	4.25
Best	"	6.00
Slip Clay	"	5.00
COAL TAR PITCH	gal.	.08
COBALT—Carbonate	lb.	1.75
Nitrate	"	1.50
Oxide—Black	"	2.26@2.30
Gray	"	2.28@2.40
Smalt, blue ordinary	"	.06
Best	"	.20
COPPERAS—in bulk	100 lbs.	.37½
In bbls.	"	.42½
COPPER—Carbonate	lb.	.18@.19
Chloride	"	.25
Nitrate, crystals	"	.35
Oxide, com'l	"	.19
CRYOLITE	"	.06½
EXPLOSIVES—		
Blasting powder, A	25 lb. keg	.65
Blasting powder, B	"	1.40
"Rackarock," A	lb.	.25
"Rackarock," B	"	.18
Judson R.R. powder	"	.10
Dynamite (20% nitro-glycerine)	"	.13
(30% nitro-glycerine)	"	.14
(40% nitro-glycerine)	"	.15
(50% nitro-glycerine)	"	.16½
(60% nitro-glycerine)	"	.18
(75% nitro-glycerine)	"	.21
Glycerine for ultro, (32-2-10° Be.)		.13⅜@13¾
FELDSPAR—Ground	sh.ton	8.00@9.00
FLINT PEBBLES—Dan. Best.	lg.ton	14.75
French, Best	"	11.75
FLUORSPAR—		
Am. lump, 1st grade	sh.ton	14.40
2d grade	"	13.90
Gravel and crushed, 1st gr	"	13.40
2d grade	"	12.40
Ground, 1st grade	"	17.90
Ground, 2d grade	"	16.50
Foreign, lump	"	8.00@12.00
Ground	"	11.50@14.00
FULLER'S EARTH—Lump	100 lbs.	.75
Powdered	"	.80

GRAPHITE—Am. f.o.b. Providence, R. I., lump	Cust.Meas. sh.ton	Price. $8.00
Pulverized	"	30.00
German, com. pulv.	lb.	.01¼@.01½
Best pulverized	"	.01½@.02
Ceylon, common pulv.	"	.02¾@.03½
Best pulverized	"	.04@.08
Italian, pulv	"	.01¼
GYPSUM—Ground	sh.ton	8.00@8.50
Fertilizer	"	7.00
Rock	lg.ton	4.00
English and French	"	14.00@16.00
INFUSORIAL EARTH—Gr'd.		
American best	"	20.00
French	"	37.50
German	"	40.00
IODINE—Crude	100 lbs.	2.45
IRON—Muriate	lb.	.05
Nitrate, com'l	"	.01¼
True	"	.04
Oxide, pure copperas color.	"	.05@.10
Purple-brown	"	.02
Venetian red	"	.01@01½
Scale	"	.01@.03
KAOLIN—(See China Clay.)		
KRYOLITH—(See Cryolite.)		
LEAD—Acetate, white	"	.07¾@.08
Brown	"	.06
Nitrate, com'l	"	.06½
" gran.	"	.08¼
LIME—Com., abt. 250 lbs.	bbl.	.80
Finishing	"	.90
MAGNESITE—Greece.		
Crude (95%)	lg.ton	6.00@6.50
Calcined	sh.ton	17.50@18.00
Bricks	M	170.00
Am. Bricks, f.o.b. Pittsburg	"	175.00
MAGNESIUM—		
Carbonate, light, fine pd.	lb.	.05
Blocks	"	.07@.09
Chloride, com'l	"	.01¾
Fused	"	.20
Nitrate	"	.60
Sulphate	100 lbs.	.75@.95
MANGANESE—Powdered, 70@75% binoxide	lb.	.01¼@.01½
Crude pow'd. 75@85% binoxide	"	.01½@.02¼
85@90% binoxide	"	.02¼@.03¼
90@95% binoxide	"	.03¼@.05½
Carbonate	"	.16@.20
Chloride	"	.04
Ore, 50%, Foreign	unit	.18@.19
Domestic	"	.30
MARBLE—Flour	sh.ton	6.00@7.00
MERCURY—Bichloride	lb.	.77
MICA—N. Y. gr'nd, coarse	sh.ton	33.00@38.00
Fine	lb.	.00⅞@.02
Sheets, N. C., 2x4 in.	"	.30
3x3 in.	"	.80
3x4 in.	"	1.50
4x4 in.	"	2.00
6x6 in.	"	3.00
MINERAL WOOL—		
Slag, ordinary	sh.ton	19.00
Selected	"	25.00
Rock, ordinary	"	32.00
Selected	"	40.00
NICKEL Oxide, No. 1	lb.	1.00
No. 2	"	.60
Sulphate	"	.20@.21
OILS—Black, reduced 29 gr.:		
25@30, cold test	gal.	.09¾@.10¼
15, cold test	"	.10¾@11¼
Zero	"	.11¾@12¾
Summer	"	.09¼@.09¾
Cylinder, dark steam ref.	"	.08¾@.10¾
Dark, filtered.	"	.11¼@.15¾
Light, filtered.	"	.14¾@.17¾
Extra cold test	"	.21¾@.26¾
Gasoline, 86°@90°	"	.15@.20
Naphtha, crude, 68°@72°	bbl.	9.05
"Stove"	gal.	.12
Linseed, domestic raw	"	
Boiled	"	.48
Calcutta, raw	"	.75
OZOKERITE	lb.	.11½
PAINTS AND COLORS—		
Chrome green, common	"	.05
Pure	"	.16
Yellow, common	"	.10¼
Best	"	.25
Lampblack, com'l	"	.04½
Refined	"	.07
Litharge, Am. pow'd.	"	.04¾@.05¼
English flake	"	.08¼@.08½
Glassmakers'	"	.07¼@.08

PAINTS AND COLORS—	Cust.Meas.	Price.
Metallic, brown	sh.ton	$19.00
Red	"	16.00
Ocher, Am. common	"	9.25@10.00
Best	"	21.25@25.00
Dutch, washed	lb.	.04⅞
French, washed	"	.01½@.01⅞
Orange mineral, Am.	"	.07¾@.08
Foreign, as to make	"	.08⅛@.11¼
Paris green, pure, bulk	"	.12
Red lead, American	"	.05¾@.06
Foreign	"	.06⅝@.08
Turpentine, spirits	gal.	.54¼@.54½
White lead, Am., dry	lb.	.04½@.04¾
American, in oil.	"	.05½@.05¾
Foreign, in oil.	"	.06⅞@.09⅛
Zinc, white, Am., ex dry.	"	.04⅜@.04⅝
American, red seal.	"	.06½
Green seal	"	.07
Foreign, red seal, dry	"	.05¾@.08½
Green seal, dry	"	.06½@.09½
POTASH		
Caustic, ordinary	"	.04⅞@.05
Elect. (90%)	"	.06½
POTASSIUM—		
Bicarbonate cryst	"	.08¼
Powdered or gran.	"	.14
Bichromate, Am.	"	.08¼@.08¾
Scotch	"	.08½@.09
Carbonate	"	.03½@.03¾
Chromate	"	.35
Cyanide (98@99%)	"	.23
Kainit	lg.ton	9.05
Manure salt, 20%	100 lbs.	.66
D'le Manure Salt, 48@53%.	"	1.12
Muriate, 80@85%	"	1.83
95%	"	1.86
Permanganate	lb.	.09¼@.10
Prussiate, yellow	"	.13⅝@.14
Red	"	.36
Sulphate, 90%	100 lbs.	2.11
96%	"	2.14
Sylvinit	unit	.39½
QUARTZ—(See Silica).		
SALT—N. Y. com. fine	sh.ton	2.00
N. Y. agricultural.	"	1.50
SALTPETRE—Crude	100 lbs.	3.35@3.40
Refined	"	4.25@4.62½
SILICA—Best foreign	lg.ton	10.00@11.00
Ground quartz, ord.	sh.ton	6.00@8.00
Best	"	12.00@13.00
Lump quartz	"	2.50@4.00
Glass sand	"	2.75
SILVER—Chloride	oz.	.65
Nitrate	"	.35
Oxide	"	.85@1.10
SODIUM—		
Bichromate	lb.	.06¼
Chlorate, com'l	"	.07¼@.08
Hyposulphite, Am.	100 lbs.	1.60@1.65
German	"	1.70@1.90
Peroxide	lb.	.45
Phosphate	"	.02⅝
Prussiate	"	.11@11½
Silicate, conc.	"	.05
Com'l	"	.01
Sulphate, com'l	100 lb.	.75@.82½
Sulphide	lb.	.01¼
Sulphite crystals	"	.02½
SULPHUR—Roll	100 lbs.	1.85
Flour	"	1.90
Flowers, sublimed	"	2.15
TALC—N. C., 1st grade	sh.ton	13.75
N. Y., Fibrous, best.	"	10.20
French, best	100 lbs.	1.25
Italian, best	"	1.62½
TAR—Regular	bbl.	2.30
Oil barrels	"	2.40
TIN—Crystals	lb.	.22
Oxide	"	.45
URANIUM—Oxide	"	2.25@3.00
ZINC—Metallic, ch. pure	"	.07@.09¾
Carbonate, ppt.	"	.09
Chloride solution, com'l.	"	.02¼
Chloride granular	"	.04½@.04¾
Dust	"	.04½@.04¾
Sulphate	"	.02⅛@.02¼

THE RARE EARTHS.

	Cust. Meas.	Price.
BORON—Nitrate	lb.	$1.50
CALCIUM—Tungstate (Scheelite)	"	.60
CERIUM—Nitrate	"	10.00
DIDYMIUM—Nitrate	"	35.00
ERBIUM—Nitrate	"	40.00
GLUCINUM—Nitrate	"	20.00
LANTHANUM—Nitrate	"	30.00
LITHIUM—Nitrate	oz.	.60
STRONTIUM—Nitrate	lb.	.06⅞@.70
THORIUM—Nitrate 49@50%.	"	4.50
URANIUM—Nitrate	oz.	.25
YTTRIUM—Nitrate	lb.	40.00
ZIRCONIUM—Nitrate	"	8.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable.