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CONTENTS.

DEPARTMENTS

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 in care of the JOURNAL and making its office their headquarters. The managers of the branch offices will also be glad to welcome visiting engineers and to be of any service to them that they can.

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SILVER reached this week the lowest price on record, selling at a fraction under 50 cents an ounce in New York. The decline has been so gradual for several months past that this extreme low point has excited very little attention or comment. The causes of the decline have been referred to in our columns from time to time. They are still in operation, and it is not impossible that the low record of 50 cents may be passed during the next few months.

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THE GENERAL strike of the French coal miners is still unsettled, in spite of the interference of the Government. Threatened disorders have been prevented by the presence of a strong force of troops near the mines, but there has been no resumption of work. The Government appointed a commission to arbitrate the matters in dispute, but the miners of the Pas-de-Calais have voted almost unanimously not to accept the decision of the arbitrators. It is now proposed to call a general convention of the miners at which new proposals will be submitted. The most serious consequences so far have been the stoppages or partial shut-downs at several important iron and steel works, in consequence of short supplies of fuel. Imports of coal from England and Belgium have naturally increased; but at several ports the dock workmen have refused to handle imported coal, thus introducing further complications.

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THE ENCOURAGING nature of the natural gas developments at Heathfield, Sussex, England, which are reported by such of our British contemporaries as *The Times* and the *Engineer*, opens a wide vista of industrial possibilities. The deepest hole is said to be only 400 feet, and it yields 15,000,000 cubic feet of gas per day at 200 pounds pressure. The composition of the gas is approximately 72.5 per cent of methane, 5.5 per cent of higher hydrocarbons, 4 per cent of carbon monoxide and 18 per cent of oxygen. This is somewhat lower in combustible than gas from American sources, but it is nevertheless a very high grade of fuel, and is said to have an illuminating power of 12 to 14 candles, without any previous enrichment. The most remarkable statement is that, having regard to the known extent of the Kimmeridge clays, in which the gas occurs, it is probable that the East Sussex gas-field is larger than any known to exist in America. Although the developments up to the present time appear to us to be quite insufficient to justify any such comparison, the mere fact that a well of 15,000,000 cubic feet capacity has been opened only 46 miles from the City of London, and drawing from a formation that has a large extent, is a development of very great importance.

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THE PRODUCTION of pig iron in Great Britain for the first half of 1902, as reported by the British Iron Trade Association, reached a total of 4,096,478 long tons, against 3,884,544 tons in the first half of 1901, showing an increase of 211,934 tons, or 5.5 per cent. This year's output was, however, less than that of the first half of 1900 by 443,925 tons, or 9.8 per cent. The partial recovery from last year's depression indicates a recovery in trade, which was largely due to the greater imports this year.

The production of steel ingots for the half-year is reported as follows, in long tons:

	1901.	1902.	Changes.
Bessemer	791,925	888,378	I. 96,453
Open hearth	1,630,958	1,771,038	I. 140,080
Total	2,422,883	2,659,416	I. 236,533

Of the open-hearth steel made this year 1,529,963 tons were acid and 241,075 tons basic steel, the proportions showing very little change from 1901. Of the bessemer steel 563,476 tons were acid and 324,902 tons basic; the figures showing a great increase in the use of the basic bessemer process. The total gain in output was 9.7 per cent, showing a substantial advance over last year, though the figures are still behind those for 1900. It will be seen that the increase in steel was proportionally much larger than in pig iron.

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ELSEWHERE IN THIS issue we print an abstract of an extremely interesting paper by Mr. Henry F. Collins, who describes therein his solution of a unique metallurgical problem at the Santa Fé Mine, in the State of Chiapas, Mexico. He had a low grade copper ore of peculiar character in the treatment of which numerous perplexing problems arose both in the dressing and in the smelting. It is to his credit that he overcame them successfully, and the elaborate means that he employed in doing so are the more remarkable in view of the remote location of the mine, its difficulty of access necessitating the sectionalization of all the machinery, and the high cost of transportation thither. It is only those engineers who have had experience in mining and smelting in some out of the way part of Mexico who can fully appreciate the difficulties that must be surmounted in exploiting even a simple proposition, and to read an account of a complex installation for ore dressing on old-fashioned lines, tempered with modern ideas, in such a place is certainly astonishing. The variety of machines employed by Mr. Collins would be remarkable anywhere.

Aside from his description of his particular problem and its solution, Mr. Collins gives us some notes of his experiments which are of general value, such as his conclusions concerning the working of Wilfley tables on very low grade material, the efficiency of vanners, the operation of the old Cornish buddle, and the effect of the substitution of cord-wood for a part of the coke in the matte smelting furnace. His minute analysis of his work in all its branches, locating the

losses by careful weighings and samplings, not only makes his results the more valuable, but also is the more creditable to him in view of the conditions under which we conceive the work must have been performed.

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IN OUR ISSUE of October 18 we referred to the opinion held by many German economists that industrial combinations are a natural development of the times and serve a useful purpose in adjusting the supply of commodities to the demand; in other words, eliminating the evils of over-production. The subject of trusts and trade agreements (cartels) was discussed at the annual meeting of the Bund der Industriellen at Berlin, October 9, which adopted the following resolution:

"The Bund sees in trusts the natural step in the development of industry. They appear to be called on to adapt production to demand and to prevent useless competition, which is usually accompanied by the deterioriation of commodities. The economic advantages, therefore, cannot be denied, so long as they do not tend to injure the consumer dependent on them, and so far as they rekulate production with a view to the maintenance of fair prices, diminish the cost of production and improve methods of industry. As regards industries, however, which are working on raw materials and which are at the mercy of trusts in raw stuffs, the producers see in the present overgrowth of the latter an evil calling for measures which will assure an economic counterpoise."

The Bund der Industriellen is a semi-political association which stands for the commercial interests of Germany in opposition to the policy advocated by the Agrarian, or agricultural, party. Its expression of opinion may be regarded, therefore, as the view of industrial Germany on the trust question.

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THE PAPER BY Edmund Kirby, read before the Nelson meeting of the Canadian Mining Institute, the substance of which is given in another column, voices in plain and vigorous language the feeling which has been growing in British Columbia mining circles for some time past. There has been an unmistakable feeling that the mining interests which have done so much to make British Columbia and maintain its prosperity, have been in one way or another forced to bear a share of the expenses of maintaining the government altogether out of proportion to the benefit which they received and to their interest in the State. A heavy burden has been imposed in the way of taxation, while the eight-hour law and other restrictive measures have served to reduce the producing power and profits of the mines. While there is doubtless another side to the case than the one Mr. Kirby has so strongly presented, there seems to be little doubt that there is a substantial foundation for the mine-owners' complaints. It is true that the general tendency of human nature is to believe that its particular interest is overtaxed, and that some one else ought to take the larger share of the burdens of government. Making allowance for this feeling, however, we think that there is a substantial foundation of justice in the mine-owners' claims, and we trust that they will receive some attention from the legislature of the Province. There are rich mines in British Columbia, but a large proportion of its mineral deposits are of a low grade, and in the nature of things must be worked, if they are worked at all, on a narrow margin of profit. To many of these, additional taxation or restrictive legislation may mean the difference between activity, which would be in the highest degree beneficial to the country, and between practical abandonment. The JOURNAL, as our readers well know, has always maintained that while every citizen should bear a fair share of the cost of maintaining the State, the special taxation of productive industries is the worst policy which could be adopted in any community, especially a new and growing one, and the legislature of British Columbia does not seem to have borne this principle in mind.

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THE METRIC SYSTEM IN GERMANY.

There is a movement in Germany toward a modification of the present system of weights and measures which will legalize the use of one-fourth and one-half pound weights (125 and 250 grams, respectively), the purpose being to provide smaller units than the kilogram and also to conform to the persistent tendency of the people in general to halve and quarter the unit. This scheme has received the indorsement of the chambers of commerce of many important cities, but has met with the opposition of those in many equally important places. At the meeting of the Vereins zur Wahrung der Interessen der Chemischen Industrie Deutschlands at Frankfurt am Main, September 19, 1902, a memorial addressed to the Bundesrath was adopted protesting against the unnecessary complication that would arise from the introduction of new units of weights, such as the half and quarter pound, and recommending that all possible official action be directed toward discouraging the use of the pound and its parts in favor of the kilogram and the double centner (100 kilograms).

We trust that the policy of the Government will be in conformity with this recommendation, inasmuch as it will eventually eliminate a troublesome confusion which at present exists in German weight units. The German pound happened to be, fortunately or unfortunately, equivalent to half a kilogram, and this gave an opportunity for its survival as a unit, just as the real in Mexico and the "bit" on the Pacific Coast, of which two make a quarter dollar, have continued in common parlance. Even now in Germany, 30 years after the introduction of the metric system, weights are to a considerable extent referred to in pounds, although that unit has no standing in law. However, that is not confusing, because everyone knows what a pound is, and there is no way of mixing it up with anything else, but when it comes to the question of centners perplexity arises, at least, it does in the minds of foreigners. There is the centner of 100 pounds and the centner of 100 kilograms. The latter is commonly distinguished as the metric centner, or else as the double centner, but frequently the adjectives are omitted, and then it may be a puzzle as to whether the centner referred to is 100 pounds or 100 kilograms. The use of the term double centner is explicit, but it nevertheless implies a recognition of the old pound. Aside from the question of phraseology, however, every German publication introducing the word centner should have it clearly stated in some prominent place what kind of centner is meant, until it becomes unnecessary because of the survival of only one kind.

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A SUGGESTIVE INCIDENT.

Mr. Rives, the corporation counsel to the City of New York, has recently forwarded to the borough presidents certain suggestions for the proper drawing up of contracts, and he gave advice which has a useful bearing upon similar documents prepared by other members of the community—mining engineers, for example. The distinguished counsel recommends the avoidance of the word "that" as an introduction to clauses; he urges the omission of the word "said" in referring to a person or subject previously spoken of; he suggests that the length of paragraphs should be determined by the subject treated and that the number of sentences or paragraphs should be as few as is consistent with clearness. He might have warned the unwary against the too frequent employment of relative pronouns and co-relative sentences, as he did not fail to do in the case of the similar blunder of beginning a sentence with a verb unless the noun to which it belongs is readily apparent.

Mr. Rives is not posing as an arbiter of simple English, but his action serves, in an admirable way, to emphasize the tendency, becoming increasingly apparent, to drop the usage of obsolete forms of speech and other technicalities which are mere wordiness. It is no habit of ours to read the literary efforts of borough presidents as embodied in municipal documents and correspondence, yet we vibrate with sympathy toward the learned counsel of Greater New York when we recall the verbosity, turbidity and "I-take-my-pen-in-hand" style of the average mining report. Language, said the cynic, was given to man to conceal his thoughts, but reports are not paid for with this end in view. The business man who engages a specialist to advise him in the conduct of a mining enterprise is not looking for scientific fireworks, but an intelligible statement of facts, not an opinion couched in professional language and overloaded with terms which none but a technical man can understand, but a clear setting forth of the data themselves so that the client himself can follow the reasoning upon which the opinion is based. There was a time, it is true, when a client found it best to skip the matter composing the body of a pseudo-scientific report and turned to the last paragraph, which ordinarily, but not always, gave the final conclusions in every-day language—the language to which the client was accustomed in his own office. Our friends the lawyers did also once think it their privilege to treat their clients as first-class passengers by dealing in a phraseology handed down from medieval times, but nowadays the weird Latinity of the law is becoming beautifully less, and a client is permitted and enabled to get some sort of understanding of his own affairs as intrusted to his counsel.

Mining, of course, is a business and not a scientific pursuit; reports are not literary efforts or pretentious pyrotechnic displays intended for the schoolroom, but they are, or should be, statements made as simple, clear and plain as possible,

with a view to conveying to an untechnical person the result of investigations made by a technical expert. Therefore, "don't" bespatter a report with such wordiness as Mr. Rives condemns; avoid the use of "dynamic," "metamorphic," "metasomatic" and similar words, which have a big sound and no meaning except when they are employed with precision *by* scientific men and *to* scientific men; do not pad a report with geological dissertations unless they have a direct bearing on actual mining conditions, and—don't refer to the scenery unless the mine is played out!

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MINING IN SOUTH AMERICA.

The special commissioner of the London *Economist,* whose reports on the mining districts of different countries have shown a great deal of discrimination and careful observation, in a recent issue of his paper takes a pessimistic view of mining in South America. While some of his remarks are undoubtedly just, it seems to us that in other respects he has gone too far. With regard to metal mining in South America, he characterizes the deposits as small and scattered, a remark which might apply in some instances, but it is far from being true in others. He has undoubtedly taken little account of the important deposits of gold and silver and other ores in the mountain regions of Peru and Bolivia, while he has made very little account of the still comparatively unknown resources of Brazil and also of the possibilities of further discoveries in the Guianas. It is true, as the writer remarks, that mining in Colombia and Venezuela has been seriously disturbed by the political troubles in those countries, while the exploitation of the gold placers of Ecuador has been far from successful. In Venezuela no large mine has been opened since the exhaustion of El Callo. It is not by any means impossible, however, that other mines may be hereafter opened in the same district, which has not been explored or prospected with any approach to completeness. In Brazil, it is true that the Ouro Preto and St. John del Rey are the only metal mines of importance, but it must be remembered that a large portion of the country is hardly known as yet, and that great opportunities for metal mining in the future are presented by the deposits of iron and manganese ores, which have been so far explored as to assure their great extent, although their actual workings have been very small.

In the Argentine Republic, it may be said that mining has hardly begun. The mineral deposits so far as known are in the extreme western portion of the country, bordering on the Andes, and it will take some time before even their approximate value is ascertained.

The greatest activity in mining at the present time is found on the western slope of the Andes, in Peru and Chili. A number of gold mines are being opened —chiefly by foreign capital—and some of these promise very well. The most important work now in progress is the exploitation of the Cerro di Pasco mines, which have for many years been operated as silver mines, but have developed with depth into a great copper deposit. They are now controlled by capitalists from the United States, and are to be worked on a large scale.

There is some promise also that on the eastern slope of the Andes, the gold and tin mines of Bolivia may be more actively exploited than they have been recently. Certainly, there are great opportunities for the future to be found there.

South America as yet is a region rather of possibilities for the future than of present achievement. There are signs, however, that a change in these conditions may be looked for before long.

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MARKET CONDITIONS.

Iron and Steel.—The iron market continues to be more or less affected by transportation difficulties, and these have combined to make the production of pig iron so irregular that in many cases furnaces find themselves unable to keep up their contract deliveries. The steel manufacturers who depend upon purchased supplies have been in many cases suffering from this state of affairs, and in their turn have been unable to keep up their contracts. Prospects of improvement are not as good as they might be, especially as the railroads continue to be burdened with an enormous traffic in grain and general freight. Aside from this, the chief topic of discussion in the trade is the course of the United States Steel Corporation in maintaining a moderate level of prices and in some cases making reductions in its quotations. As we have heretofore remarked this seems to be in the main a wise policy, and the company is doubtless convinced that it is better to maintain the consumption at as high a level as possible than to run the risk of curtailing it by increase of prices. There is every indication that this policy is to be maintained and that large demands will not be allowed to run away with the market. Some of the smaller concerns have been disposed to criticise this policy very sharply, but have not been able to make any headway against it.

Copper.—The copper market continues rather quiet and shows but little change. Rumors of increased stocks and possible oversupply continue to be industriously circulated, but are mainly without foundation. The source and object of these rumors is readily understood, but the policy of their originators is not always easy to divine.

Other Metals.—The demand for tin continues good, and prices show but little change. There has been some improvement in spot supplies.

Lead shows no change, either in price or demand. The new lead combination appears to have made no advance, and some doubts even are thrown upon its success.

Spelter has been quiet and rather dull; while demand continues fair there has been no pressure on the part of consumers. Many of the consumers seem to be holding back in hopes of a further fall in the metal.

There has been nothing during the week to maintain the price of silver. Demands from the East continue very small, while special orders for coinage purposes are entirely lacking. The metal this week reached the lowest price on record, selling under 50 cents an ounce in New York. Many observers are inclined to think that the fall will continue in the absence of any reason to anticipate a better demand.

Coal.—The western coal market continues demoralized. As the period for the close of Lake navigation approaches, every effort is being made to rush coal to the Lake ports, but the railroads are still far behind the demands upon them. There is no doubt now that the season will close with a very short supply in the northwest, and this will mean the payment of a higher price, made necessary by an all-rail haul. In the large western cities, supplies are improving a little but the trade is still in bad condition.

COMBINATIONS OF IRON AND SILICON.

M. P. Lebeau recently contributed an article on this subject to the *Annales de Chemie et de Physique,* which is abstracted in the *Transactions* of the Institution of Civil Engineers. The author has studied the composition of the different compounds of iron and silicon by a method which was discovered accidentally in the production of glucinum by the electric furnace. This consists in heating mixtures of iron with twice its weight of commercial cupro-silicon, or copper containing about 10 per cent of silicon, in a Doulton crucible lined with carbon for several hours in an air-furnace, fired first with coke, and subsequently with gas-retort carbon. The melted product, which is of a bronze color, and almost malleable, is treated with 10 per cent nitric acid, which dissolves away the cupreous portion, leaving a crystallized residue whose composition is Fe_2Si, fusible at about 1200° C. to a crystalline mass resembling white cast-iron. By increasing the proportion of cupro-silicon to iron more highly silicized compounds are obtained up to about 33 per cent of silicon. These are divisible into two parts, one magnetic corresponding to Fe_2Si, and the other iron magnetic of the composition FeSi. This is harder than Fe_2Si, and is less readily acted upon by acids. A third silicide of the composition $Fe\,Si_2$ has been obtained by heating metallic-iron in the electric furnace with five times its weight of silicon and carbon-silicide when a residue is obtained in small crystals of a density of 5.4, and a hardness between that of fluorspar and apatite. This appears to be the highest compound obtainable. The composition of the three compounds is:

	Silicon.	Iron	Specific Gravity.	Hardness.
Fe_2Si	20.0	8.0	6.85	6.5
FeSi	33.3	66 66	6.17	8.5
$FeSi_2$	50.0	50.0	5.40	4.5

In commercial fero-silicons containing less than 20 per cent of silicon that element is present as Fe_2Si dissolved in iron. Those with 20 per cent to 33 per cent contain both Fe_2Si and FeSi, those above 33 per cent both FeSi and $FeSi_2$, and those above 50 per cent $FeSi_2$ with excess of free silicon. In ordinary dark gray foundry-iron with a maximum of 4 per cent of silicon, Fe_2Si is present dissolved in excess of free iron as a perfectly homogeneous solution when solidified.

GERMAN IRON PRODUCTION.—The output of the German blast furnaces in September is reported by the German Iron and Steel Association at 718,702 metric tons. This is 18,134 tons less than in August, but shows an increase of 93,482 tons over September of 1901. For the nine months ending September 30, the total pig iron production was as follows in metric tons:

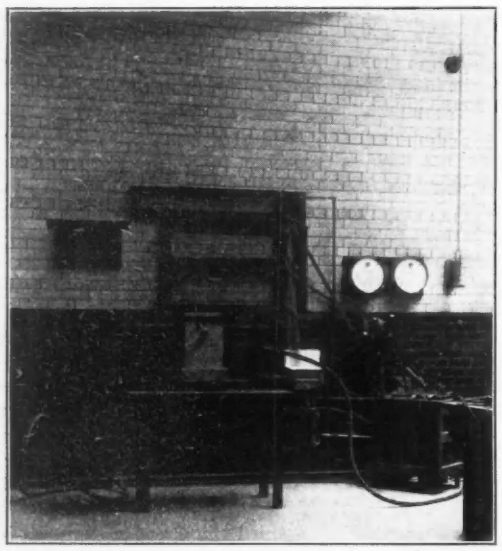
	1901.	1902.	Changes.
Foundry iron	1,123,226	1,187,738	I. 64,512
Forge iron	1,037,705	895,757	D. 142,038
Bessemer pig	354,868	294,138	D. 65,730
Thomas (basic) pig	3,350,970	3,797,602	I. 446,632
Totals	5,871,859	6,175,235	I. 303,376

The total production shows an increase of 303,376 tons over that for the corresponding period in 1901, and was nearly equal to that for the three quarters of 1900. The gain over last year is in large part due to the increase of the export trade, chiefly to Great Britain and the United States. The total exports of pig iron for the nine months of this year were 225,118 tons, against 96,288 tons for the corresponding period of 1901. There was also a large increase in manufactured iron, the greater part of which was understood to be in steel billets, although the German reports do not give the item separately.

THE ELECTRO-CHEMICAL LABORATORY AT OWENS' COLLEGE, MANCHESTER.

BY EDWARD WALKER.

The first laboratory opened in England for the study of and research in electro-chemistry and electro-metallurgy is at the Owens' College, Manchester. It forms part of the new extension devoted to electrical technology that was built in memory of the late Dr. John Hopkinson, and formally opened last year. The laboratory consists of two rooms, the larger of which is 37 by 36 feet, and the smaller one 23 by 20 feet. The



MOISSAN FURNACE AT OWENS COLLEGE.

illustrations give views of the larger room. Two double benches 16 feet long occupy the center of the room, and in front of the windows and along part of the walls there are also benches, while the rest of the wall space is left free for fitting up depositing tanks, etc. The wall benches are provided at the back with a glazed stoneware gutter, which empties into small sinks, so that water from condensers and steam baths is easily led away. The benches and general arrangements are similar to those in a chemical laboratory, with some unimportant exceptions. For instance, there are no reagent stands on the benches, but only accommodation for a few on small portable stands, while the bulk are kept on a general stand in the middle of the room. Gas, water, compressed air at four atmospheres, and steam are led to convenient situations around the room, and each set is colored differently. Two sets of electric wires are provided. One is supplied with current from the general distribution board of the physical laboratories, and gives a large current at from 2 to 100 volts. The other series provides current used in electrolytic work, and is connected up to each bench. The source of supply of current is obviously generous, as the laboratory is adjacent to the electrical engineering department, where there is always plenty of energy, and the laboratory is also in connection with the town mains.

The lighting is naturally done by arc and incandescent lamps. There are two ordinary fume chambers, and also a tiled bench 12 feet 6 inches long, covered with a hood connecting with the flues, which is used for the larger experiments, and for gas furnace work. Under a hood connecting with a chimney are two crucible furnaces. There is a large arc furnace of the Moissan type working at 500 to 600 amperes and 50 volts. In the smaller laboratory there are store cupboards, blowpipe benches, a slab for balances, and three working places similar to those in the larger laboratory. Both rooms are lit from the roof, as well as by windows running down one side, and the arrangements for ventilating and warming have been carefully planned.

In connection with the laboratory there is a lecture course. The subjects treated in the lecture room and laboratory include the electrolysis of chloride, the refining of copper, silver and nickel plating, the electrolysis of molten salts, the manufacture of carbides, the reduction in the Moissan furnace of those metals, which are obtained only with difficulty; the production of chlorates, permanganates, etc., and quantitative electrolytic analyses and separations. The course is under the direction of Mr. R. S. Hutton.

ORE DRESSING AND SMELTING AT SANTA FE, MEXICO.*

BY HENRY F. COLLINS.

The ore deposits of the Santa Fe mine are almost unique, being an occurrence of bornite and chalcopyrite, together with garnet, in a gangue of wollastonite. The copper minerals are gold and silver-bearing; the garnet is also gold-bearing. Free gold occurs in the ore, but to a less extent than near the surface. The specific gravity of the component minerals of the ore was determined as follows: Bornite, 5.00; chalcopyrite, 4.15; garnet, 3.89, and wollastonite, 2.90. The present system of treatment is designed on the idea of making a concentrate, assaying upward of 40 per cent copper, for shipment, and a middling product assaying from 5 to 15 per cent copper, averaging about 7 per cent.

Ore Dressing.—The ore from the mine, assaying about 2.25 per cent copper after hand sorting, is put through the roll and jig mill, which

ELECTRO-CHEMICAL LABORATORY AT OWENS COLLEGE.

is of the ordinary type. It has a 7 by 10 in. Blake crusher, which delivers to a set of 14 by 24 in. rolls. The product of the latter is discharged at will into either of two Tulloch feeders, which deliver to two sets of 14 by 24-in. rolls, on each side of the elevator, for fine crushing. This arrangement saves time in changing rolls, rebabbitting bearings, etc. There are three cylindrical trommels, 3 by 6 feet, covered with steel plate punched with 8, 6 and 3.25 millimeter round holes respectively. The undersize from the last trommel is sorted by spitzlutten into products of approximately 3.25 to 2 millimeters, and 2 to 1 millimeter, besides a pointed box which gives a fine meal size. The overflow from the pointed box goes to a settler which thickens the pulp for treatment on a convex, revolving table. The five coarser sizes are treated on five pairs of three-compartment Harz jigs.

During the year ended September 30, 1901, the roll and jig mill ran 318 days of 24 hours, and treated 28,210 long tons of ore, an average of 88.7 tons per day. The average grade of the ore was 2.61 per cent copper. The production of concentrates was 756.5 tons, averaging 45.17 per cent copper; of garnet middlings, 613 tons, averaging 9.53 per cent copper. The tailings averaged 1.41 per cent copper. At present the ore milled assays only a little more than 2 per cent copper and the tailings produced are also of lower grade than formerly.

The tailings from the jig mill are collected in a settling pond, whence they are removed to a 30-stamp mill. The stamps (in batteries of five) weigh 650 pounds, and drop 5 or 6 inches, 102 to 105 times per minute. The battery screens are copper wire cloth (14 mesh, No. 21 wire) with 1 millimeter apertures. Even with this coarse mesh sliming is excessive. Inside plates scoured so badly that they proved useless. A splash plate in front of the screens was found serviceable. The apron plates are 8 feet long, in two four-foot lengths, with a well and 2-inch drop between them. They are dressed every four hours, using a little cyanide, and the amalgam is collected every 24 hours in the usual way. In 1901 the stamp mill ran 10 months, averaging 28 days, 4.5 hours per month, and crushed 18,243 long tons of tailings (average 2.12 tons per stamp per day), yielding 1,695.06 ounces of bullion, 795 fine (equivalent to 0.077 ounces, or about $1.54 per ton crushed).

From the apron plates the pulp passes to six Gilpin County bumping tables, made of amalgamated copper, with the object of saving part of the scoured amalgam at the same time as they effect a partial concentration. Neither of those ends is satisfactorily attained, although the tables much more than pay for themselves. From the bump-tables the pulp passes over amalgamated copper guard plates to three small pointed boxes with upward current. The coarse discharge from two of these classifiers goes to three sand jigs; that from the third goes to a Wilfley table; while the fine overflow from all three goes to a series

* Abstract of a paper presented before the Institution of Mining and Metallurgy, Oct. 16, 1902.

of three pointed-box classifiers, each feeding a convex slime table. The monthly production of concentrates from the jigs and table averages, after rewashing, about 8 tons, assaying 34 per cent copper, 2.4 ounces gold, and 60 ounces silver, besides the garnet middlings (about 26 tons per month), which go to the smelting department; these contain 6 to 9 per cent copper. About 55 tons per month of poor middlings, assaying 3 or 4 per cent copper, are accumulated pending the installation of a Wetherill magnetic separator, experiments with which have given very encouraging results.

The Wilfley table in the fine-crushing mill gives inferior results as compared with those of the jigs, and a careful study of it has led to the following conclusions:

1. The Wilfley table is particularly well suited to a pulp which will yield a considerable percentage of concentrate, and not nearly so well suited to low-grade complex material yielding less than 1 per cent of concentrate.

2. The Wilfley table is not at all well suited to the treatment of an unsorted pulp containing some very coarse material (over 30 mesh) mixed with fine slime. Even sand-jigs, properly adjusted, do somewhat better on such material.

The tailings from the jigs and Wilfley table in the fine-crushing mill pass out, separate from the slimes tailings, into a series of settling "strips," or "strakes," where a considerable quantity of enriched sand is deposited. This is at intervals rewashed by hand three successive times on a strip which is something like the old Cornish square buddle, only much longer and narrower, a small stream of clear water being used. The final product is a coarse garnet sand mixed with fine bornite and chalcopyrite, containing scarcely a trace of quartz or wollastonite. It averages 8 to 10 per cent copper, 0.3 to 0.35 ounce gold, and 12 to 15 ounces silver, about 4 to 5 tons per month being got.

The overflow from the three classifiers in the fine crushing mill passes successively to three spitzkasten, each of which feeds a convex table. The first table produces about 55 tons per month of material assaying about 2.3 per cent copper, and the second about 28 tons assaying 3 per cent copper, the tailings from each containing about 0.7 per cent copper. The third table produces about 14 tons of concentrate assaying 6 per cent copper, and 17 tons of middlings assaying 2.75 per cent copper. The heads from the first and second tables and the middlings from the third are washed further on vanners. The vanning plant comprises two 4-foot side shake machines (Frue pattern) and two end-shake (Embrey pattern). As at many other places, the side-shake, though suitable enough for coarse material, is found altogether too violent for treating really fine slimes, for which purpose the end-shake, although of less capacity, is more suitable, giving lower tailings and a better saving. The vanner plant is therefore so arranged that the two Frues and two Embreys work independently and alternately as suitable material accumulates for each. Each pair is fed by a "strip" discharging into a dolly-tub agitator, so as to equalize the feed as much as possible. Both sets produce a low-grade garnet concentrate, that from the Embreys averaging about 9 per cent copper, and that from the Frues about 8.5 per cent. In each case the gold assay is about 0.3 ounce, and the silver about 17 ounce. The tailings from both sets are high, averaging nearly 1.5 per cent copper, with 0.075 once gold and 2.75 ounces silver. The efficiency of even the end-shake vanners, i. e., the percentage saving when reconcentrating any of these products, is very low.

The tailings from the Embrey vanners are of sufficiently uniform size to be buddled directly after thickening in a large pointed box; those from the Frues are first run through a small pointed box, which separates the coarser (poorer) sands. The thickened stream from the larger box is passed to a single Cornish buddle, which fills from 6.5 to 7 inches deep in about 20 to 22 hours, and is then emptied, an operation which takes about two hours. The heads and middlings of the buddle are retreated separately on the vanner whenever sufficient of either material accumulates for a run equal to a buddle-full. The tailings are poor enough to throw away, but the buddle slimes often contain over 1 per cent copper, in which case they are retreated by feeding by means of a "strip" to one of the round tables.

Careful tests were made to determine the efficiency of the buddle. Considering the entire vanner and buddle concentration it appeared that in treating a pulp containng 3.65 per cent copper, the vanner took out only 58 per cent of the total copper contents, delivering it as a product assaying only 8.71 per cent copper, and leaving the remaining 42 per cent in the tailings, which assayed 2.02 per cent copper. Out of the latter, the Cornish buddle took out 48.6 per cent of the copper in a concentrate assaying 4.48 per cent and 32 per cent more in the form of middlings assaying 2.36 per cent, actually losing only 15.4 per cent of the copper contents fed to it by the vanners in the form of tailings and slime, the general average assay of which is only 0.86 per cent copper. It is a not generally recognized fact that the Cornish buddle, when properly fed, is one of the most perfect appliances known in its special field; that is, the saving of a small quantity of fine, rich material from a considerable quantity of poor, somewhat coarser tailings, with a minimum of loss, when the differences in specific gravity are small and the pulp contains mineral of specific gravity intermediate between that of the concentrate and that of the tailings. Its usefulness is unfortunately limited by three disadvantages, the large amount of labor required, the floor space needed, and inability in one operation either to produce a clean concentrate or to definitely reject as clean tailings more than one-third to two-thirds of the material fed to it.

The results of the system of concentration as practiced are summarized in the following statement, which is the mean of the figures for the months of November and December, 1901:

		Metal Contents.		
	Tons of 2240 lbs.	Gold oz.	Silver oz.	Copper tons
Quantity of ore crushed.	2,670.00	430.62	10,620.25	56.73
Concentrates produced ..	57.48	125.80	4,049.42	26.05
Middlings produced	167.35	56.37	2,274.82	13.42
Bullion produced	.....	101.17	28.38	....
Total metals saved.....	.....	283.34	6,352.62	39.47
% of metals saved.....	.....	69.85	59.89	70.47

The total cost of milling is 4s. 7d. per 2,240 pounds of ore, not, however, including any proportion of the general expense of administration.

In spite of the complicated procedure the final tailings still assay from 0.6 to 0.8 per cent copper. This is due to the difficult character of the ore. The bornite and chalcopyrite break under the stamps into fine slime, a large proportion of which, even when only 14 mesh screens are used on the batteries, will pass a 120-mesh sieve. The garnet, on the other hand, breaks into more or less spheriodal grains of various sizes. The wollastonite, which is so tough as to resist comminution longer than the other minerals, breaks finally into minute needles or fibers, the length of which is often four to eight times their thickness. When attempting to water-sort the pulp, a considerable proportion of the heavy bornite accompanies the much larger rounded grains of garnet, yielding a mixed product which it is wellnigh impossible to separate further; but the bulk of it, being an almost impalpable flour, remains in the slimes and clings to the filaments of wollastonite, which, although owing to their fineness settle very slowly, yet once stranded on the surface of a table offer considerable resistance to bring washed off. The average assay of the tailings for the last quarter of 1901, determined on samples taken mechanically every 10 minutes, was 0.65 per cent copper, 0.046 ounce gold and 1.85 ounces silver. Experiments on these tailings with the Elmore process were unsuccessful, and the only chance of further reducing the loss appears to be in a repetition of concentrations on tables and buddles.

Smelting.—The conditions under which the Santa Fe Mine is operated necessitate that as much as possible of the value of the ore be collected in a concentrate of high enough grade to stand shipment, and as much as possible of the remainder in the form of middlings that can be smelted at the mine. The smelting of this cupriferous garnet presented some difficult problems. Early attempts at smelting it in a reverberatory furnace proved a failure, chiefly on account of the inferiority of the wood which was the only available fuel. It was then decided to brick the product and smelt it in a blast furnace. This has proved successful.

The ore is mixed with 10 per cent of lime and 1 or 2 per cent of wood ashes, and is bricked by means of a home-made hand-machine. After a suitable drying the bricks become so firm that only about 10 per cent are broken in handling. The total cost of bricking and stacking, including the rebricking of broken ones, is 6s, per ton.

The smelting furnace is 36 by 66 inches at the tuyeres, and 12 feet in height above the tuyeres, 8 feet of the height being water-jacketed. The jackets are set in two tiers, 14 in the upper and 12 in the lower. There are 10 tuyeres. The furnace has an unusual degree of bosh, but otherwise is of the standard type. The smoke is taken off, through a movable charging hood, by means of an overhead down-comer to a large dust chamber behind the furnace, from which a flue leads to a sheet iron chimney, 5 feet in diameter and 60 feet high. The blast is supplied by two No. 3 Root's blowers. The furnace was provided with a slag trap for constant flow of slag, which, however, proved a failure because of the high viscosity of the slag that had to be produced. For the same reason it proved impracticable to use a forehearth, and the furnace had to be run with an internal crucible, tapping the slag from the end, and the matte from the front.

In the first campaign the separation of matte from slag proved perfect. The slag averaged only 0.37 per cent copper, 0.037 ounce gold and 0.85 ounce silver. Of the copper in the ore, 96.5 per cent was recovered; of the gold, 95.6 per cent; of the silver, 96 per cent. The quantity of ore smelted was 1,808.54 tons, of which 706.36 were bricked middlings, 625.47 coarse garnet middlings, and 476.71 selected garnet ore. The average assay was 0.677 ounce gold, 13.57 ounce silver and 8.58 per cent copper. The quantity of matte produced was 301.229 tons, which averaged 3.9 ounce gold, 82.65 ounces silver, and 50.5 per cent copper. The ratio of concentration was about 6:1. The average quantity of ore smelted per 24 hours was 62.36 tons. Of the ore charged 34.6 per cent was garnet sand, which had all passed a 5-millimeter screen. As a rule no trouble was experienced by the sifting down of this fine material. The average composition of the slag, together with that of the garnet of the ore, was as follows:

	SiO_2 %	Al_2O_3 %	FeO %	CaO %	MgO %	Cu_2O %	Total %
Slag	41.50	8.42	19.28	29.23	0.30	0.45	99.18
Garnet	36.35	12.37	*19.43	33.33	0.40	nil	101.88

* Fe_2O_3.

The similarity between the two analyses is very striking. The extra silica in the slag is derived partly from the coke ash, but chiefly from quartz and chalcedony in the picked ore smelted. In toughness and other physical characteristics the slag was very unlike copper furnace slags commonly met with. The flue dust amounted to only 2 per cent of the weight of the ore smelted; it consisted mainly of coke-dust and wood ashes, and assayed only 4.7 per cent copper.

The campaign may be divided into two periods, one of 11 days, in which English coke alone was used, the consumption averaging 15.05 per cent;

and one of 18 days, during which wood was gradually substituted for part of the coke, whereby the consumption of the latter was reduced to an average of 11.5 per cent during the 18 days. In accordance with previous experience it was found that not more than one-third of the coke could be replaced by poor wood without causing the heat to rise, the smelting zone to cool off, and serious disturbance to occur in the regular descent of the charges. For steady running it was found best not to attempt replacing more than one-fourth of the coke by wood. The wood available was of very inferior quality, and about 28 kg. of it were required to replace 8 kgs. of coke, although the exact amount was not weighed, so many sticks of a given size being counted into the furnace for each charge.

The effect of replacing 30 tons of coke by 107 cords, or about 81 tons, of this inferior wood was not only a cash saving of about £250 in 18 days, or £14 per day, but a considerable decrease in the weight and increase in the grade of the matte produced; for it is a well-known fact, that the increased volume of furnace gases produced carries away sulphur from the charge, part of it undoubtedly in volatile combination with hydrogen, and probably with carbon also. The increase in copper contents of the matte was about 4.5 per cent, equal to a reduction of its weight by 10 per cent, which caused a saving of about £180 in freight, on the production of the 18 days, or £10 per day, so that the total saving due to the replacement of coke by wood amounted to about £24 per day's run while the replacement lasted.

The cost of smelting was high, chiefly on account of the coke. The latter was the best Durham. The loss in handling was moderate, not over 6 per cent of fines being screened out at the mine, in addition to about 12 per cent lost in transit, which involved numerous rehandlings. The total cost per ton of coke weighed into the furnace was £9 10s. In the first campaign the total cost of smelting was £1 11s. 3d. per ton, divided as follows: Briquetting, 2s. 7d.; smelting labor, 3s. 4d.; coke, £1 4s. 9d.; firewood, 5d.; sundry materials, 2d.

In February, 1902, a second smelting campaign took place, and taking advantage of the experience gained during the first run, from the start one-third of the normal coke-charge was replaced by an equivalent quantity of wood, viz., 2.5 times the weight of the coke replaced. There were absolutely no hitches in the smelting, although only 12 per cent of the total charge consisted of ore, while 55 per cent of it consisted of fine sand and slime middlings, bricked with lime in the way already described, and the remaining 33 per cent was loose garnet jig-middlings, the particles of which varied in diameter from 2 to 7 millimeters. When, however, toward the end of the run the clean garnet jig-middlings had been all smelted, and an old accumulation of half-cleaned middlings, containing a large proportion of wollastonite, was used instead, considerable difficulty was found in keeping the furnace open in spite of taking off most of the wood and substituting coke, and irregularities continued even after an increase in the fuel charge. It was found necessary to replace nearly one-half of this refractory garnet and wollastonite sand by an equal weight of slag, before the furnace would run well, even on a somewhat increased consumption of fuel.

The quantity of ore smelted in the second run was 1,306.76 metric tons, averaging 68.8 tons per day. During the greater part of the run,when only clean jig-middlings were smelted, the average rate was 76.56 tons per 24 hours, and the consumption of coke (in addition to wood) averaged 10.3 per cent. The quantity of matte produced was 173.49 metric tons, averaging 50.8 per cent copper, 3 ounces gold and 89.7 ounces silver. The slag averaged 0.28 per cent copper, 0.042 ounce gold and 0.8 ounce silver. The cost of smelting was about the same as in the first run. Throughout this article the costs are reported in sterling, converted from Mexican currency on the basis of $1 equals 24d.

THE LAKE OF THE WOODS DISTRICT, ONTARIO.

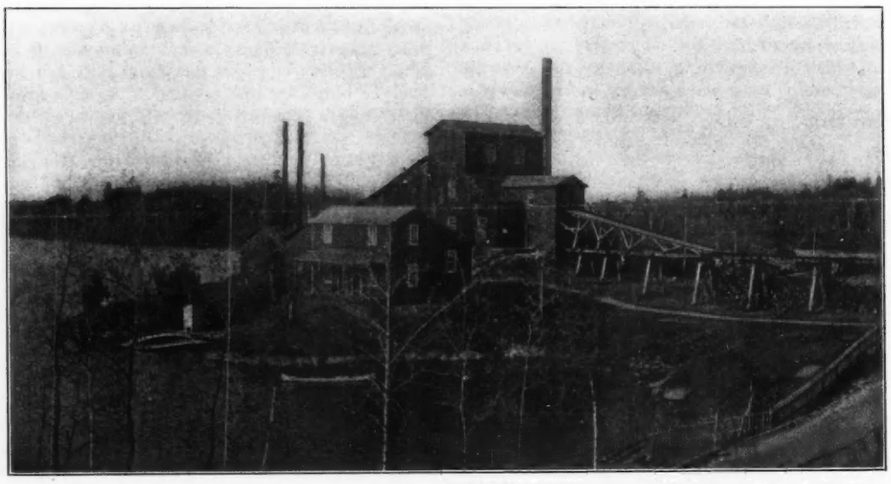
BY OUR SPECIAL CORRESPONDENT.

A transfer of considerable importance in the Lake of the Woods District in Western Ontario, has recently been made. The property owned by the Dominion Gold Mining Company, which includes the reduction works at Rat Portage, the Scramble Mine and a number of locations more or less developed, has been sold to a new concern, known as the Keenora Mining Company, which was recently incorporated with a capital of $1,000,000. The new company has also taken options on a mine and several locations at Cedar Lake, near the Mikado Mine. The deal was closed by Mr. A. M. Hay, president of the Dominion company, the purchasers being represented by Mr. M. A. Myers, of Warren, Pa., the promoter of the new company and also of the Big Master Company in the Manitou District.

The Rat Portage reduction works were built in 1890, and were said at that time to have cost $80,000; the object of the construction was to work ores from different mines which could be brought to this central point. Since then the old milling plant, which at first consisted of two standard pulverizers, has been replaced by 20 stamps, arranged in 4 batteries of 5 stamps each. Four of these stamps were built by Fraser & Chalmers, of Chicago, and the remainder by Ribon & March, at Jersey City, N. J. The mill is very solidly built, the foundations resting on solid rock, and being built up with heavy stone and cement mortar, and timbers of British Columbia pine. In addition to the stamps the mill has a Blake crusher and a Lynn rock breaker, each having a capacity of 120 tons a day. There are 4 bins for holding ore, with a capacity of 25 tons each. The rock from the crushers is delivered to the batteries through Tulloch feeders. The crushed ore from the stamps passes through the concentrating plant, which contains 3 Frue vanners, 2 Krupp vanners and 3 canvass slime tables the latter having proved very useful in working some of the ores sent to the mill. There is also a fine grinding and amalgamation plant, in which part of the concentrates are treated and a reverberatory furnace for roasting the pyritic concentrates. As already noted, the mill was built with a view to treat ores from different mines owned by other companies. It has also a good deal of custom work for owners of other properties. It is admirably situated, being close to the main line of the Canadian Pacific Railroad, while on the other side it adjoins the lake and has a wharf built out into deep water. The Rat Portage water power is not far distant, and it is proposed by the new company to utilize this power in running the works and thus reducing the cost of operating them. The water power can be obtained at a rate of $10 per horse-power per year, and this would bring down the cost for the ore to a very low figure.

The Scramble Mine is about 5 miles from Rat Portage, and is about ½ mile distant from the railroad. A spur track is to be built to the mine for the purpose of transporting the ore to the works. The development work at this mine has opened up an ore-body of considerable size, but of rather low grade. It is believed, however, that by mining on a large scale the ore can be worked at a profit, with the facilities provided by the reduction work. Some other properties purchased by the new company are so situated that ore can be conveyed to the reduction works by water. This can be done by barges at a very low cost.

The expectation is that this deal will result in a very considerable increase of business in this district. It is said that Mr. Hay takes a considerable interest in the new company, and that Mr. D. C. Cameron, of Rat Portage, is also interested.



RAT PORTAGE REDUCTION WORKS.

COMBINED MANUFACTURE OF SODIUM BICHROMATE AND BICARBONATE.—Peter Spence & Sons, Limited, of Manchester, England, have patented the process which consists in treating a solution of sodium chromate with ammonia and carbon dioxide until half of the sodium is precipitated as carbonate, after which the solution of ammonium and sodium chromate is drawn off and the ammonia is expelled, leaving a solution of sodium bichromate which can be concentrated as desired. The ammonia is returned to the process. (German patent, No. 133,736, May 2, 1901.)

METALLIC CALCIUM.—L. Stockem has been experimenting upon the electrolysis of molten chlorides of the alkalies and the alkaline earths and by the use of new apparatus, devised by W. Borchers, it has been found that metallic calcium can be obtained by the decomposition of anhydrous calcium chloride in a much simpler way than heretofore, and it is believed that thereby the metal can be produced commercially with advantage. By the employment of a small cathode and a large anode, with the electrolyte at moderate red heat, the temperature being maintained below the melting point of the metal, but, of course, above that of calcium chloride, spongy calcium is deposited, which is compressed by means of a pair of broad, previously heated, iron tongs, sweats together and can be removed as a mass containing about 90 per cent Ca. The crude metal can be refined from the calcium chloride with which it is contaminated. The method and apparatus are described by Borchers and Stockem in *Zeitschrift fur Elektrochemie*, VIII, xl, 103, Oct. 2, 1902. Metallic strontium can be produced in a similar way.

THE ANTHRACITE COAL STRIKE COMMISSION.

The statement filed by the United Mine Workers with the Commission was briefly referred to in our last issue. While it contains nothing especially new, we give it in full below, as a matter of record:

To the Anthracite Coal-Strike Commission:

The mine workers make of the operators the following demands, which were formulated by the Shamokin convention, held March 18 to 24, and for the enforcement of which the strike was inaugurated:

First—An increase of 20 per cent upon the prices paid during the year 1901 to employees performing contract or piece work. This demand is made on account of the following reasons:

(1) The present rate of wages is much lower than the rate of wages paid in the bituminous coal fields for substantially similar work.

(2) The present rate of wages is lower than is paid in other occupations requiring equal skill and training.

(3) The average annual earnings in the anthracite coal fields are much less than the average annual earnings in the bituminous coal fields for substantially similar work.

(4) The average annual earnings in the anthracite coal fields are much less than the average annual earnings for occupations requiring equal skill and training.

(5) The rate of wages in the anthracite coal fields is insufficient to compensate the mine workers in view of the dangerous character of the occupation in relation to accident, the liability to serious and permanent disease, the high death rate, and the short grade-life incident to this employment.

(6) The annual earnings of the mine workers are insufficient to maintain the American standard of living.

(7) The increased cost of living has made it impossible to maintain a fair standard of life upon the basis of present wages, and has not only prevented the mine workers from securing any benefit from increased prosperity, but has made their condition poorer on account of it.

(8) The wages of the anthracite mine workers are so low that their children are prematurely forced into the breakers and mills, instead of being supported and educated upon the earnings of their parents.

(9) Wages are below the fair and just earnings of mine workers in this industry.

Second—A reduction of 20 per cent in hours of labor without any reduction of earnings for all employees paid by the hour, day or week. The second demand is similar to the first in that it is designed to increase the hourly rate of wages of mine workers employed by the hour, day or week, and all the reasons applicable to the first demand are asked to be applied to the second with repetition. In addition thereto we submit the following:

(10) The ten-hour day is detrimental to the health, life, safety and well-being of the mine workers.

(11) Shorter hours improve the physical, mental and moral conditions of the workers.

(12) Shorter hours increase the intensity and efficiency of labor.

(13) The tendency of national and State government of organized trade and of production generally is towards shorter hours.

(14) A working day of eight hours is sufficiently long for the best interests of the workingmen, and of the community.

Third—The adoption of a system by which coal shall be weighed and paid for by weight wherever practicable; the minimum rate per ton to be 60 cents for a legal ton of 2,240 pounds; the differentials now existing at the various mines to be maintained. This demand is made on account of the following reasons:

(1) Measurement by the legal ton wherever practicable is the only honest and just system of measuring the earnings of mine workers.

(2) When the operators sell or transport coal, it is on the basis of a legal ton of 2,240 pounds.

(3) The excessive ton was originally intended to compensate the operator for the weight of the small sizes of coal, which were then discarded, but which are now utilized and sold, and therefore there is no present necessity for the use of any other than the legal ton.

(4) The adoption of this system would remove an incentive both to the operator and the worker, the cheating and dishonesty, and would allay jealousy among the miners and prevent unjust discrimination and favoritism.

(5) The change of the present system to the one asked for would prove a strong factor in allaying suspicion and discontent among the mine workers.

Fourth—The incorporation in an agreement between the United Mine Workers of America and the anthracite coal companies of the wages which shall be paid and the conditions of employment which shall obtain, together with satisfactory methods for the adjustment of grievances which may arise from time to time to the end that strikes and lockouts may be unnecessary. In support of this demand we submit the following reasons:

(1) The anthracite mine workers should not be compelled to make or sign individual agreements, but should have the right to form such organization and choose such agents and officers as they desire to act collectively instead of individually when they deem that their best interests are subserved thereby.

(2) Agreements between employers and employees through workingmen's organizations are the ordinary method of regulating production and wages in the bituminous coal-fields and in other large industries, and are beneficial, successful, and in keeping with the spirit of the times.

(3) Unions of workingmen tend to the better discipline of the men and to the improvement of their physical, moral and mental conditions, and to the preservation of friendly relations between employer and employee.

(4) Experience shows that the trade agreement is the only effective method by which it is possible to regulate questions arising between employers and employed in large industries, and that a trade agreement is the only possible way to establish the relations between employers and the wage-workers in the anthracite fields on a just and permanent basis and as far as possible to do away with any causes for the recurrence of such difficulties as those you (the Anthracite Coal Strike Commission) have been called in to settle.

Respectfully submitted,

JOHN MITCHELL,

Representative of the Anthracite Mine Workers.

The members of the Anthracite Strike Commission completed their preliminary investigations into the conditions prevailing in the mines last week. This included, as we have heretofore noted, visits to a number of collieries and some interrogation of miners and superintendents. The Commission on November 7 adjourned until November 14, when it is probable that the formal hearings and taking of testimony will begin.

AMERICAN PRACTICE IN SMELTING SILVER-LEAD ORES.

Dr. M. W. Iles, in his recently published treatise on Lead Smelting, page 130, gives the following averages of six years' operations: Assay of bullion, 266 ounces Ag and 3.49 ounces Au per 2,000 pounds; assay of matte, 10.96 per cent lead, 14.8 per cent copper, 6.42 per cent zinc, 0.73 per cent barium, 35 per per cent iron, 1.25 per cent manganese, 20.29 per cent sulphur, 77 ounces silver and 0.08 ounce gold; composition of slag, 31.37 ounces silica, 28.57 FeO, 5.86 UnO, 14.22 CaO, 4.19 BaO, 2.87 MgO, 6.17 ZnO, 6.10 alumina, 1.52, sulphur, 0.05 CuO, 0.57 PbO, the total footing up to 101.49; average assay of slag in silver, 0.84 ounce per 2,000 pounds; in gold, from a trace to 10 cents per 2,000 pounds. The average temperature of the slag was 1031° C.; specific gravity, 3.36. Average specific gravity of matte, 4.64. The quantity of ore smelted per furnace per day was 125 tons (highest yearly average, 144 tons). The blast pressure varied from 39 to 47 ounces. Percentage of lead, 12.58; of matte, 9.03; of flue dust, 2.43 (highest yearly average, 3.5, lowest, 1.32); of fuel, 13.85. One ton of ore smelted produced an average of 0.95 ton of slag. The quantity of iron flux was gradually diminished because of its cost. A more siliceous and better slag was then produced. An ideal slag would be 32 per cent silica, 32 per cent iron bases, 22 per cent alkaline earths, 10 per cent zinc and alumina, and 4 per cent of other substances.

METHODS FOR ASSAYING CYANIDE SOLUTIONS FOR GOLD.

BY T. LANE CARTER.

There are now quite a number of methods for finding the amount of gold in potassium cyanide solutions, but it is difficult to find more than one or two methods described in one place. It is hoped that this compilation will prove useful as a reference list of the ways of determining the gold contents of working cyanide solutions. The list is no doubt incomplete, but it is believed that the methods here given are sufficient for cyanide plants in any part of the world.

1. The most popular way of determining the gold contents of solutions on the Witwatersrand is by means of the old evaporation method. Solutions from the foot of an extractor box, carrying only a few grains of gold per ton, usually require 1,000 c.c. for an assay. For other solutions 700 c.c. (practically 24 A.T.) are taken for an assay. The solution is poured into an enameled iron dish, and placed over a paraffin blow-lamp, or on top of a drying plate. A little litharge is sprinkled into the solution, which is then allowed to boil to dryness. The residue is scraped out, and a mixture of carbonate of soda, borax and argol is placed with it in a crucible, put into the crucible furnace and allowed to fuse. In about 20 minutes the fusion is complete. A small piece of silver is hammered into the lead button, which is then cupeled. The bead is parted and fine gold per ton of solution reported.

2. Pour 500 c.c. of solution into an evaporating dish, put it in a stink cupboard with a good draft, add nitric acid until the solution shows an acid reaction, boil for 15 minutes, then add ½ gram silver dissolved in nitric acid, filter and fuse the filter paper with the precipitate as usual, with litharge and flux, then cupel.

3. Take 1,000 or 500 c.c., add an excess of sulphate of copper, then acidify with nitric, sulphuric or hydrochloric acid. Filter and fuse the precipitate in a crucible with litharge; then cupel.

Methods 2 and 3 are described by A. F. Crosse in the *Journal* of Chemical and Metallurgical Society of South Africa, May, 1902.

4. To find both gold and silver in a solution, take 1,000 or 500 c.c. of the solution, and precipitate the silver with a solution of sodium sulphide. Filter off the remaining liquor, dry and wrap the precipitate in sheet lead with a little granular lead, and cupel. The remaining solution containing the gold is treated with chloride of zinc, which precipitates the gold. This is then dried, mixed with granular lead, and cupelled.

5. Prepare a solution of mercuric chloride in water, 100 grains to 1 ounce. Keep in glass stoppered bottle. Take 8 or 10 ounces of solution to be listed, accurately measured. From a burette run in mercuric chloride solution in excess, that is, until a drop of mercuric solution produces no further precipitate. Filter, wash the precipitate and dry. Flux with same fluxes as for evaporation test in a small crucible in the muffle, pour. Detach lead button, cupel. Weigh free bullion, part; weigh gold, and calculate 8 ounces, or 10 ounces assay table, according as 8 ounces or 10 ounces were used.

6. Carefully measure 8 ounces or 10 ounces of the solution to be tested. To this add 20 drops bichromate solution. Run in strong nitrate of silver solution, until the deep red color of chromate of silver appears. This shows the consumption of all cyanide and precipitation of gold and silver as

argentic-auric-cyanide. Add 100 grams of zinc dust, mix thoroughly. Add sufficient H_2SO_4 to dissolve all the zinc when all evolution of hydrogen has ceased. Filter, wash the precipitate, dry. Wrap the precipitate in lead foil; place in crucible, melt, pour, then cupel. Dissolve out all silver with HNO_3, weigh and calculate the gold.

These methods, Nos. 5 and 6, are from Gaze's *Practical Cyanide Operations.*

Not one of these methods can be put down as the best, for any case that might arise. The reason that method 1 is so popular on the Rand is due to the division of labor that prevails. For instance, the assayer of a mine generally has an efficient white assistant, and one or two Kaffir helpers. Either the assistant assayer, or one of the Kaffirs puts the solutions on the fire very early in the morning. When the assayer comes to the office he finds the operation of boiling finished, and the residues ready to flux, so that no time is lost in getting out the results.

Suppose, however, that the assayer had no asistant, and in order to use the evaporation method he would have to turn out at 5.30 o'clock on a cold morning. I am of opinion that he would soon take to some other method.

When you have no assistance, I believe that methods 2 and 3 are to be preferred to 1. Method 3 promises to become popular on the Rand, but will not supplant method 1.

In this country the scorification assay is much less used than in America, possibly on account of the generally lower grade material we deal with. From force of habit, I suppose, Rand assayers seem to prefer to flux the residues from cyanide solution assays in the crucible furnace, with litharge, rather than to use the scorifier with granulated lead.

PRODUCTION OF BARIUM OXIDE.—Dr. A. R. Frank, of Charlottenburg, Germany, mixes finely ground witherite and barium carbide and heats in a retort or crucible, with exclusion of air, the following reaction taking place:

$$3\ BaCO_3 + BaC_2 = 4\ BaO + 5\ CO.$$

So soon as the rapid evolution of gas ceases the reaction is completed and pure, white barium oxide remains. Strontium carbonate is reduced in an analogous manner. Barium sulphate and barium sulphide are also reduced by barium carbide. (German patent, No. 135,330, January 6, 1901.)

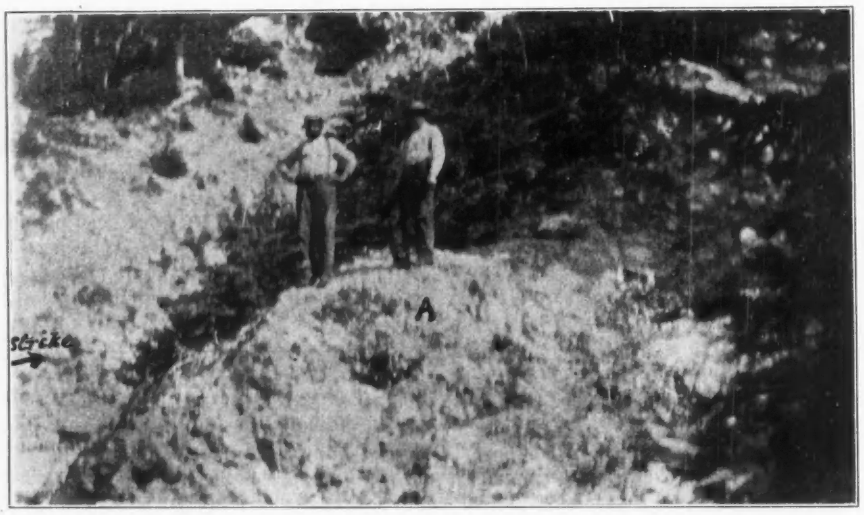
A RAPID METHOD OF ESTIMATING LIME.—In a recent communication to the Royal Society of New South Wales, F. B. Guthrie and C. R. Barker described a rapid method of estimating lime. The method consists of mixing previously dried and powdered ammonium nitrate with the calcium oxalate precipitate obtained in the usual manner. The oxalate is converted into calcium nitrate, which is very readily and completely converted to oxide by a few minutes' ignition over a bunsen burner. Prolonged ignition over the blowpipe is quite unnecessary, and effects no further alteration of the weight of the precipitate. Figures were given showing the accuracy of the method.

GREAT SCOT COPPER LODE, CHELAN COUNTY, WASHINGTON.

By Robert Young.

The accompanying photographs of this contact lode will no doubt be acceptable information, and interesting to the readers of the ENGINEERING AND MINING JOURNAL. Photography, in such instances, gives at a glance a clear conception of a surface cropping having every indication of a deposit of mineral.

Ten years ago the writer was piloted into this part of the country by an experienced prospector to look at a discovery which he had made, which, upon examination, proved to be a 9-inch vein of bornite ore and quartz in a porphyry formation. As the trip had to be made in one day by a very rugged and precipitous route with the object of taking a near cut, only a short time was left for investigation, and nothing further was done with the discovery at that time. As more is now known of this region, and an easier route has been found, a better description is available.



QUARTZ OUTCROP, GREAT SCOT LODE, WASHINGTON.

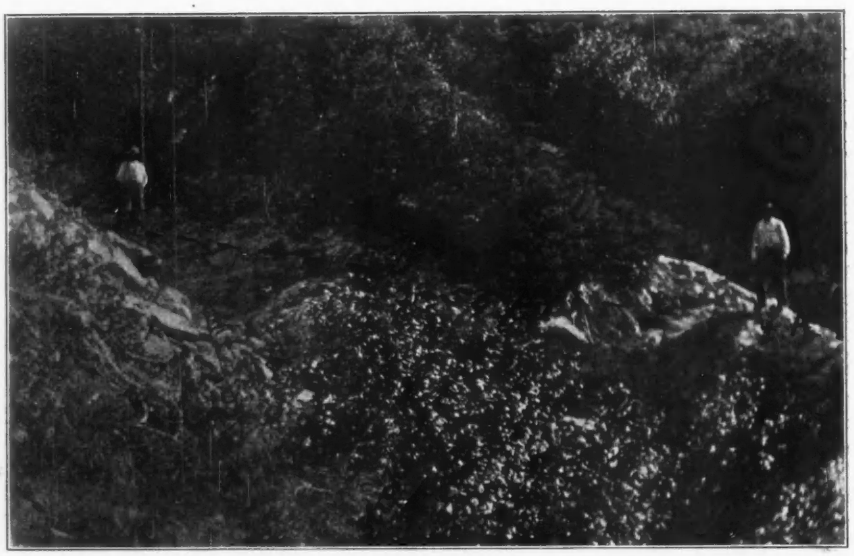
There is every evidence of a deposit of copper and gold bearing ore in a contact formation lying between a large metamorphic dike to the southwest in Kittitas County, and the granite formation on the northeast side in Chelan County, which extends eastward from the Index Mountains in King and Snohomish counties. A peculiar feature of this mineral formation is its extreme regularity, as it has an apparent width of 1,000 feet or more—at intervals. Over this whole distance good samples of bornite and chalcopyrite are to be found. The surface cropping of quartz, granite and porphyry is all more or less impregnated with the same character of mineral. Those quartz lodes, porphyry, granite and small seams of quartz in the granite run in uniform and parallel courses. One of the quartz lodes illustrated by the photograph measures 55 feet in width, and in a hole drilled 2 feet in depth, on being blasted, a good grade of chalcopyrite ore was exposed.

Another noticeable feature in this formation is the freedom with which the quartz or other mineral parts from the porphyry or granite; in no instance have I seen it frozen to those rocks; even the thin quartz seams carrying bornite are quite free when the granite is broken open. This is a characteristic of the whole mineral formation over a distance of 7,500 feet, which I have examined. I also found in solid white quartz beautiful specimens of native copper, in appearance like sprigs of moss; a very peculiar circumstance, as the quartz contained no other mineral. This is certainly a most interesting formation geologically speaking, and forms a study in mineralogy from the variety of ores contained therein.

The district reviewed is situated on French Creek, a tributary of Wenatchee River, which flows into the Columbia River. Access to this region is obtained by wagon road from Cle-Elum, on the Northern Pacific Railway, or by trail 25 miles long from Leavenworth, on the Great Northern Railway. Several mines are being developed in the immediate vicinity, and the time is near at hand when a railroad will be constructed to transport the products of these properties to the smelters on Puget Sound; or smelting plants may establish contiguous to the mines.

The timber in the locality is good for such an elevation—5,000 feet—and consists of fir, cedar, hemlock, juniper, tall and straight, 100 to 200 feet high, and 2 to 4 feet through. Juniper of such dimensions is very exceptional.

There is every indication of a body of ore being exploited here in depth, and the owners of the property have commenced to develop their property on practical lines by running a tunnel at a low level following the mineral. This tunnel when in 500 feet will gain a depth of 400 feet, reaching what is to all appearance the ore-shoot. When that is reached it is the intention to cross-cut, and ascertain the width and values in the whole formation. This property is owned by Mr. Richard Lewis and others of Cle-Elum, Washington.



GREAT SCOT LODE, WASHINGTON.

GOLD IN METEORITES.—At a recent meeting of the Royal Society of New South Wales, Prof.

Liversidge exhibited under the microscope particles of a malleable yellow metal, insoluble in nitric acid, which have all the appearance of gold, obtained from certain Australian and European meteorites (siderolites). The presence of gold in meteorites bears upon the presence of gold in meteoric dusts, and it is also of great interest, the professor said, in connection with the presence of gold upon the earth and in sea water, inasmuch as meteorites and the dust of meteorites are constantly falling upon the earth, to the extent of probably many million tons a year.

MINE TAXATION IN BRITISH COLUMBIA.*

By EDMUND B. KIRBY.

In most mining districts of the world the difficulties which we as engineers have to confront are mainly business-technical problems. Methods and economies in mining, transportation, milling and smelting, studied both from the scientific and the business side, absorb our attention.

In few cases do questions of state economics force themselves upon us, because mining is almost everywhere a favored industry, treated by governments with fostering care, and considered worthy of every sacrifice and every encouragement by the State. It is rightly recognized as the mother of industries, focusing the attention of the entire world upon each newly discovered area. Upon this all the resources of civilization in men, money and skill are poured out. Around it agriculture, stock raising and lumbering spring up; railroads appear without the aid of land grants or subsidies, manufactures and towns follow and a commonwealth is established.

Now the British Columbia mining industry is unique in the world, not only in its entire lack of State recognition and fostering, but in the fact that difficulties imposed by State economics overshadow in importance all the ordinary technical and business problems with which mining men have to deal. It affords to-day a curious and interesting illustration of the injury wrought by unwise government and also of the reaction of repressed mining upon commerce and other industries. These effects are emphasized by contrast with the present prosperous condition of the other provinces of the Dominion and also of the United States.

It is clearly recognized by the Canadian Mining Institute that British Columbia contains one of the largest and most promising mineral areas of the Dominion. But in considering the welfare of its leading industry of what use is it to concentrate attention upon the fine points of machinery, mining methods and ore treatment if we ignore such realities as a government taxation which amounts to one-fifth of the gross value of the product and a single item of which bars the treatment of low-grade ores?

The phenomenon before us presents the following features. The Rocky Mountain range has been developed from lower South America to British Columbia, yielding a practically continuous chain of productive mining districts. It is found equally productive at the two points touched of Southern British Columbia and the Yukon. The unexplored area between, some 600 miles of which is in British Columbia, should average up as well as that already known. Concerning the development of this area I quote from a memorial of the British Columbia Mining Association of June 28, 1901: "The development of these resources begun a few years ago so auspiciously, has been brought to a practical standstill, and whereas the mountains a few years ago were swarming with prospectors, to-day these pioneers of the mining industry have nearly disappeared. The flow of capital into the province has been practically cut off, the metal production is at present decreasing, numbers of producing mines have closed down and those operating have, with a few exceptions, ceased to pay dividends. The working mines are struggling under heavy burdens, which are still accumulating each year. It is now frankly admitted by mining men that the industry is prostrated in many mining divisions and that its condition is rapidly becoming worse."

Allowing for all the reaction from the mining boom, the association correctly ascribes the increasing paralysis to its two main causes—excessive taxation and oppressive legislation.

At present conditions are even worse than those then described. Prospecting and the development of new deposits to replace those exhausted, have practically ceased.

Of 14,326 crown granted and recorded claims held December 31, 1901, only 78 yielded ore in excess of 100 tons total production for the year. This is about one claim out of every 2,000 held. The bulk of the tonnage was confined to a dozen or so mines, most of these operating at a loss. The increased metal statistics of $15,000,000 for 1901 against $11,348,000 for 1900, was due entirely to two mines, neither one of which yielded dividends and one of which has announced a large increase in its debt. Moreover, the statistical figures of production are fictitious in the sense that the metals are valued theoretically by New York quotations for refined product. The true or actual values received by British Columbia industry being much less. Meanwhile the serious financial condition of the province has been clearly shown by Mr. F. J. Proctor in his pamphlet on "The Financial Crisis in British Columbia," and it is currently reported that the government met with failure in its recent attempt to float another loan in London. The stagnation of commerce and the present exodus of population is recognized by every one.

It is not of interest here to go into details about the oppressive and threatening legislation which in British Columbia has so characterized the dealings of the State with its chief industry. What is of interest is the spectacle unknown elsewhere in the Dominion, or in the empire, and probably unparalleled in the world, of a mining industry trying to exist under a burden of taxation which amounts to between 20 and 30 per cent of its gross product.

The gross products of British Columbia in 1901, as nearly as they are indicated by statistics, are about $27,000,000, distributed as follows:

Industry.	Probable Annual Production.	Per Cent
Metal mining	$15,070,382	55.1
Coal mining	5,016,398	18.3
Fisheries	3,065,900	11.2
Lumbering	1,690,000	6.2
Agricultural and miscellaneous	2,520,000	9.2
Total	$27,362,680	100

Without considering an increase in the $10,000,000 debt of approximately $800,000 yearly, the actual taxes collected (Dominion and provincial) amount to $5,350,000, which is 20 per cent of everything produced. This is from a population which probably does not exceed 125,000 to 130,000 whites. Through the shifting of taxation by other industries onto mining, the burden on the latter probably approaches 30 per cent of its product, even when the latter is valued by the aforesaid fictitious method. In this remarkable state of affairs the fact that mining exists at all is the strongest evidence of the value of British Columbia ore deposits and of the future which awaits the industry here whenever these artificial burdens are removed.

Even if the total load permitted it, low-grade ores must remain for the most part untouched on account of the so-called 2 per cent tax on the gross output of mines. This tax is only one item in the total mentioned above, but has the peculiar effect of exacting an increasing proportion of the net profits when applied to the lower grades of ore. For instance, on the milling grades of Rossland, it will seize anywhere from 10 to 20 per cent of the net profits. This bars Treadwells in British Columbia.

The present state of affairs is instructive not only to the mining profession, showing how unwise government can injure mining, but also to students of economics, presenting an extreme case of the blighting effect of taxation upon industry.

To the student the phenomenon is marked by the same familiar symptoms which always accompany evils caused by acts of the political organism. There is the same curious indifference and refusal to see facts as they are, the same tendency to ascribe the evils to every cause but the right one. There is the usual effort to conceal the truth from the outside world and to condemn those who boldly and clearly call for reform. Then there is the same old anxiety not to correct the evil, but to find excuses for evading action.

Buckle in his "History of Civilization" briefly characterizes its progress as the abolition of bad laws. Beyond this industry requires nothing. All it wants from the State is what Diogenes asked from Alexander, "Keep out of my sunshine."

As every economist knows, the State is all-powerful to injure industry, but cannot directly aid it except by the familiar procedure of assisting one branch by robbing others for its benefit. Indirectly, however, the State can do wonders by the gradual persistent removal of laws which oppress. Few people realize the sensitiveness of industry or the narrow margin of profit by which it lives. Upon its delicate organization taxation acts literally like the hand of death. It shrinks, withers or dies at its touch. Taxation which is excessive or badly placed is worse in effect than war and pestilence. As industry declines the burden becomes heavier on the survivors, and thus the disease accelerates its own progress. Such taxation kills the goose which lays the golden eggs and the bankruptcy of the State inevitably follows.

The simple principles of modern scientific taxation are well understood. In theory, if not in practice, the world has progressed since Colbert, the famous minister of France, summarized government finance simply as "The art of plucking the goose with the least amount of squealing." In the light of modern knowledge taxes may be so laid that industry is not only uninjured, but on the contrary actually benefited by them. In this twentieth century there is no excuse for excessive taxation or for Medieval methods.

The State may, if it will, not only relieve the "Mother of Industries" from all its burdens, but it may in a less important way encourage and aid it by attending to those matters which are beyond private enterprise. Maps, geological surveys, studies of districts and the collection and distribution of all kinds of information valuable to the industry, are peculiarly the province of the State. It should, however, be confined to this field, the only exception being the few cases where it is necessary for the State to interfere by regulations for the distribution of mining property and for public safety. It is easy for a department of mines to maintain such close touch and cordial relations with the whole industry as to secure its effective co-operation in all its work. It should, in fact as well as theory, be its representative, its advocate and its watchful guardian.

As to the outlook for relief in British Columbia we do not delude ourselves with any illusions. The disease has gone too far. History shows clearly that in all such cases the evil forces which control the machinery of government hold out to the last against reform. No government ever reforms until it is forced to do so by the overwhelming power of popular will. The exertion of this power is always long delayed because of the apathy and blindness of the public towards economic questions, and the long time required for it to recognize the causes of its distress. It is probable that a prolonged period of depression and suffering will be necessary to educate voters and compel reform. Meanwhile, only the richest and most fortunate mines will survive.

But notwithstanding the gloom of to-day, we

* Paper read before the Canadian Mining Institute, Nelson Meeting.

mining men, looking far beyond the present, have a clear view of the future grandeur of the commonwealth of British Columbia. We know its wonderful natural resources, the character and energy of its people. We know that civilization cannot be held back. Some day there will be good government, and with this one requisite supplied with appear an era of prosperity beyond the wildest hopes. Whether its arrival will find us here or laboring in other parts of the world we neither know nor care. We only know our present duty, which is to maintain a united front to the evils before us and steadily press the fight.

THE ASSAY OF COPPER BULLION.

By THOMAS B. SWIFT.

The following are details of a method for the determination of gold-silver in copper bullion, which may afford at least a partial solution of the problem of finding a method universally applicable. Comparisons between this method and the usual combination method have been made from time to time during a period of several months, and, where converter bars have been worked upon, this method has been proven to give higher results, and very often has given better results as applied to anodes. Owing to lack of facilities, comparisons between this method and the all-fire method have not been very thorough, but, in the few instances in which the comparison has been made, this method has shown good results.

The essential point in this method is the preliminary amalgamation of the copper to be assayed. This is accomplished by dissolving 50 grams of mercury in nitric acid and diluting to one liter. To one assay-ton of the sample, 25 c.c. of cold water are added, and then 5 c.c. of the mercuric nitrate solution. By shaking momentarily the whole of the copper wil be thoroughly amalgamated. The copper is now dissolved in 200 c.c. of a mixture of nitric acid and distilled water containing 475 c.c. nitric acid to the liter. It is preferable to prepare this dilute acid in quantities and use it cold. This mixture will be found to attack the amalgamated copper very slowly at first, increasing in rapidity as the solution gets warmer. When the violence of the action begins to diminish, the beaker is placed upon a warm plate until action ceases, when the heat should be increased and the solution brought to a boil and then diluted with 150 c.c. of hot water and filtered. At times one or two small pieces of copper or a small globule of mercury remain undissolved; these may be disregarded, as their presence will not affect the results, and it is often very difficult to get them in solution. The copper at all stages of this operation remains amalgamated. No experiments have been made to determine up to what point the gold is retained by the mercury, but results would seem to indicate that it is protected from the influences which cause losses in the usual combination method. The violence of the initial action of the acid upon the copper is greatly reduced by the amalgamation, and the use of cold diluted acid has the same effect. A little experimenting may be necesary to determine the proper amount of mercury and the necessary dilution of the acid to produce the best results. When the action of the acid reaches its maximum, a large part of the copper has been taken into solution, and placing upon a warm plate has the effect of keeping up a steady, moderate action and facilitates the expulsion of the nitrogen gases. By bringing the solution to a boil, after action apparently ceases, the expulsion of the nitrogen gases is practically complete. The solution now acquires a more or less milky appearance, inversely proportionate to the purity of the copper being assayed. This is due to the displacement of mercury of that portion of the copper which is combined with sulphur, forming mercuric sulphide which, being acted upon by the hot nitric acid, is converted into the insoluble double sulphide and nitrate of mercury. This reaction effects the desirable result of entirely eliminating the formation of the flakes of separated sulphur which are such a nuisance in the ordinary combination method. Also, the insoluble mercuric salt is a perfect collector of the gold, possessing all the advantages and none of the disadvantages of the lead sulphate formerly used for this purpose.

The 12½-centimeter paper is a very convenient size for filtering. The first two or three funnels of solution should be re-filtered. The paper is washed and the beaker is wiped out with a small piece of filter paper which, with the paper in the funnel, is dusted with finely divided test lead and placed in a 2½-inch scorifier, which has the bottom well covered with test lead.

The silver is precipitated from the filtrate with sodium chloride solution. A large excess is required, owing to the fact that silver chloride is soluble in mercuric nitrate. The first few drops of solution produce no permanent precipitate, and its further addition but partially precipitates the silver until a quantity theoretically sufficient to convert the mercuric nitrate itno chloride has been added in addition to the amount necessary for the silver. A moderate excess facilitates the precipitation. The silver chloride separates in a rather granular form and more rapidly than in the usual method especially when the solution is stirred. The presence of the mercuric salts prevents the precipitate from being acted upon by light. It is best to wait until the solution is cold before filtering. The paper upon which the silver is collected is washed and sprinkled with test lead and transferred to the scorifier containing the gold. The papers are burned, the ash covered with test lead and scorified and cupeled with the usual precautions. From the nature of the insoluble mercuric salt, it is obvious that the silver should not be precipitated before the gold is filtered off. Also it is imperative that the papers should be burned very cautiously. The writer accomplishes this by putting the batch to be assayed in a sheet iron oven placed on top of the muffle furnace before it is lighted, the gradually increasing heat of the furnace being just right for the proper drying, charring and reduction of ash of the papers. It may be advisable in some cases to make separate assays of the gold residues, adding a few milligrams of silver. In scorifying the best results are obtained by starting at a very low heat without adding any borax, the assays being gradually melted down and kept from scorifying until all indications of spitting have passed, when the borax may be added and the heat raised until scorification commences.

The following tables show some of the results obtained by this method as compared with both fire and usual combination methods:

Converter Bars:	Combination Method	All Fire Method	Modified Combination Method
Gold, oz. per ton.....	2.18	2.30	2.30
Gold, oz. per ton.....	2.20	2.24	2.25
Gold, oz. per ton.....	2.07	2.14	2.12
Gold, oz. per ton.....	1.18	1.22	1.21
Gold, oz. per ton.....	0.96	...	1.03
Anodes:			
Gold, oz. per ton.....	0.41	...	0.44
Gold, oz. per ton.....	0.90	...	0.92
Gold, oz. per ton.....	1.21	...	1.22

Some of the above results were obtained from samples of impure copper, kindly furnished by Ledoux & Co., to whom the writer is indebted for the fire assays of same. Other samples gave equally good results, but the only thorough comparison has been in the assay of samples of converter bars produced by the Mountain Copper Company at Keswick, Cal. The writer has used this method for several months in assaying these bars comparing occasionally with the other methods. The results have been very satisfactory, checking within a very small fraction the returns from anodes produced. These Keswick bars, however, are extraordinarily pure, and these favorable results are by no means indicative of success when this method is applied to the assay of the more impure varieties of copper.

It is to be hoped that this method will be given a fair trial by assayers, and if there are but a few who find its use of assistance to them the writer will feel well rewarded.

ANTIMONIAL LEAD.

Antimonial lead is produced in considerable quantity in the United States, the output in 1901, according to the statistics of *The Mineral Industry*, having been 10,656 short tons out of a total production of 392,344 tons, of which 57,898 tons was soft lead, in connection with which no antimonial lead is recovered. Antimonial lead is a by-product in the refining of base silver-lead bullion, which is likely to contain several units of antimony. Dr. M. W. Iles quotes (*Lead Smelting*, p. 133) the following analysis as typical of the base argentiferous bullion produced in Colorado: 95.35 per cent lead, 3.27 antimony, 0.28 arsenic, 0.71 copper; total, 99.61 per cent. In *The Mineral Industry* for 1896, V, 384, it was stated that formerly antimonial, or hard, lead was designed to contain only 10 or 12 per cent antimony, but at that time the greater part of the product was run up to 18 or 20 per cent antimony, and certain smelters made it as high as 35 to 40 per cent. "This antimonial lead contains generally about 6 ounces silver per ton, and sometimes as much as 10 ounces, which it does not pay to separate." Further progress has been made in reducing the gold and silver value lost in this form. Dr. Iles states (*op. cit.*, p. 137) that whereas antimonial lead used to contain 15 to 25 ounces silver per ton, the practice has now been very much improved. An analysis of over 600 tons showed 77.96 per cent lead, 20.99 antimony, 0.62 arsenic, 0.37 copper; total, 99.94 per cent, with only 0.08 ounces gold and 2.45 ounces silver per 2,000 pounds. Antimonial lead, with as high as 60 per cent antimony, may be produced, but lead with 25 to 30 per cent is best suited for the market.

CONCENTRATION OF SULPHURIC ACID.—According to the 38th report of the British alkali inspector the Kessler process receives continued extension, but although it is economical as to fuel consumption, the fuel must be a high grade of coke, which operates against the introduction of the process in some localities. Kessler stills are used to some extent in the United States, but the great bulk of the American acid is concentrated either partially or entirely in iron vessels. An installation on the American plan has recently been made by a new works in England.

METEORIC DUST IN NEW SOUTH WALES.—At a recent meeting of the Royal Society of New South Wales, Prof. Liversidge read a paper on this subject. He said that the term meteoric dust was used because it is commonly applied to the materials forming the subject of this paper; it is not intended to state that the dusts are necessarily of cosmic or extra terrestrial origin. The specimens described and exhibited were from Moruya (fell on December 15, 1880); from Uralla (fell on December 14, 182); from near Broken Hill (fell 1896); from Menindie (fell June 17, 1899); and Pambula (fell October 5, 1899). Dust from the roof-beams and mud from a covered cistern at the University and from the roof of the Observatory, Sydney; all three were collected in 1882. All the dusts are of a reddish color, except those from the University and Observatory, which are grey. The red dusts are mainly siliceous and argillaceous, and look as if they had come from dried-up water holes. They contain a variety of organic and mineral matters, such as might be expected from such a source, and in addition magnetite and metallic iron; the latter contains cobalt and nickel which seems to indicate that the dusts contain some cosmic or extra-terrestrial materials, part of which may have settled down and become mingled with the undoubted superficial terrestrial deposits and part may have been derived directly from the atmosphere. The University and Observatory dusts also yielded magnetite and metallic iron containing cobalt and nickel, and the University dust yielded particles of gold. The Moruya, Menindie and Barrier red dusts yielded particles of gold; the others have yet to be examined. Fuller information was given in the paper as to the constituents and chemical composition of the dusts

MEEHAN'S METALLURGICAL FURNACE.

The accompanying illustrations show a form of furnace for puddling or refining iron, for which United States patent No. 711,062 was recently issued to Mr. Patrick Meehan, of Lowellville, O.

In the accompanying drawings, Fig. 1 is a side view, showing the furnace and heat-supplying means. Fig. 2 is a plan view of the furnace and gas and air heating apparatus. Fig. 3 is an end view of the furnace, showing in dotted lines its position when rotated and tilted. Fig. 4 is a longitudinal vertical section of the furnace.

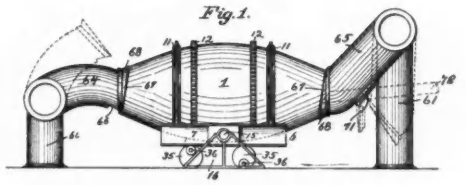
The furnace is substantially barrel-shaped, such as shown at 1, and is provided with an open neck 2 at each end thereof. The body of the barrel is preferably formed of a metal casing lined with suitable fire-resisting material or brick 4. This barrel-shaped furnace in operation lies in substantially a horizontal position, and is rotated about its axis to stir and work the metal contained therein, and to facilitate the working, stirring, and mixing of the metal the lining 4 is preferably provided with projections, ribs, or corrugations 5, extending longitudinally of the furnace. These provide shelves or projections which in the rotation of the barrel will carry the metal up and then allow it to fall down, thereby insuring a thorough working and mixing of the metal and so agitating it as to bring the slag and other impurities quickly to the surface. This barrel-shaped furnace is mounted in any suitable manner to permit it to rotate about its longitudinal axis, and for this purpose there is a frame 6, composed of the side beams 7 and the transverse curved saddle or cradle beams 8. These saddle-beams 8 are provided on their upper faces with suitable seats, upon which rest annular bands 9, secured to the barrel. The seats and bands are preferably provided with V or other shaped grooves, as shown, for receiving anti-friction balls 10. Semi-circular cap-bands 11 are secured to the saddle beams 8 and extend over the barrel, inclosing the annular bands 9 and preventing the barrel from becoming displaced. These cap-bands 11 are likewise provided with V or other shaped grooves, and the anti-friction balls 10 extend entirely around the barrel. These balls fit so closely in the grooves in the seat and bands that they prevent endwise displacement of the barrel. The barrel may be rotated in this frame by any suitable means or mechanism.

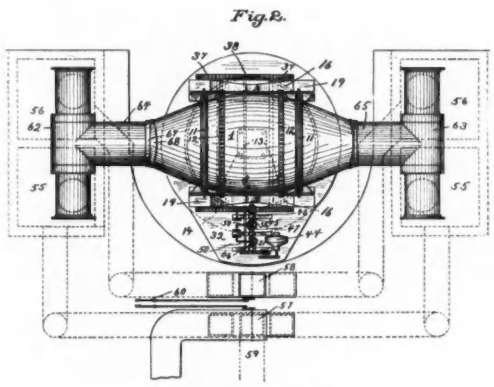
The frame 6 is provided midway of its length with trunnions 15, which are journaled in brackets or bearings 16 on the frame 19. This last-named frame is composed of suitable longitudinal I or channel beams 20, resting upon and secured to transverse I or channel beams 21. To the latter beams is secured a strong cap frame or casting 22, which bears upon the top of the central post or stud 23, so that the frame 19 can rotate about said post. To facilitate this rotation, anti-friction rollers or similar devices 24 are preferably interposed between the upper end of the post 23 and the casting 22.

The purpose of trunnioning the barrel on the frame is to permit the tilting of the barrel in ordinary operation so as to have one end lower than the other, allowing the slag and other impurities to run out; and to permit the discharge of the metal from the furnace.

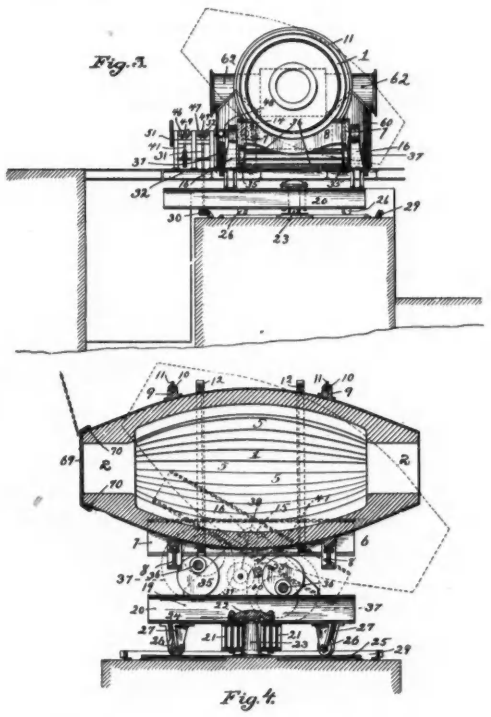
To heat the metal in the barrel connection with a source of heat is necessary. For this purpose it is best to use ordinary reversing regenerative furnaces, such as those of the Siemens type.

In operating this furnace, the charge of metal, molten or otherwise, is introduced into the barrel 1 in any desired manner—as, for instance, by introducing a runner through the door 71—and then the pipes 64, 65 are connected to the ends of the barrel. The air and gas are then turned on, thereby causing combustion in the furnace barrel 1, and this air and gas is reversed from time to time as is common in reversing furnaces. The barrel 1 is slightly inclined and is kept in constant rotation about its axis by the mechanism before described, so that the metal inside the furnace is being constantly worked, agitated, and mixed by the ribs or corrugations 5 and the impurities caused to flow out through the opening 66. When the metal has been sufficiently worked and refined, the flow of air and gas is stopped, and the pipes 64 and 65 are swung out of the way, as indicated in dotted lines, and the entire apparatus rotated about the post 23 by the mechanism before described until the barrel is substantially at right angles to its former position. Then the cams or eccentrics 35 are rotated in opposite directions by the mechanism described, thereby raising one end of the barrel and lowering the other to discharge the metal into a mold, ladle, or car.





MEEHAN'S FURNACE.



RECOVERY OF TIN FROM TIN-PLATE SCRAP.—B. A. Bergman introduces the scrap into an iron vessel filled with a solution of caustic alkali, together with a depolarizer, such as copper oxide. Electrical action sets up, the scrap is stripped and the tin goes into solution as stannate of the alkali. When a saturated solution is obtained, the tin is precipitated as oxyhydrate by means of a current of carbon dioxide. The precipitate is filtered off, dissolved in acid and tin is separated electrolytically. (Swedish patent, 14,156, June 19, 1901; *Chemiker Zeitung*, 1902, 625.)

BRIQUETTE MAKING IN GERMANY.—At the close of 1900 there were in Germany 89 manufactories of fuel briquettes, some of which annually produce more than 100,000 tons each. Turf briquettes ordinarily contain about 66 per cent. of inflammable elements, the remainder being made up of inorganic ash and water. They are thus inferior as fuel to briquettes made from brown coal, which average 70 per cent. or more of inflammable matter.

BLAST FURNACES IN GREAT BRITAIN.—The majority of the blast furnace plants in Great Britain have been better employed in 1902 than they were in 1901. The average number of furnaces employed in the first half of 1902 was 345½, against 339½ in the first half of 1901, and an average for the whole year 1900 of 397. For an increase in the first half of 1902 of only 6½ furnaces there was an increased output of 211,934 tons, which points to a higher average capacity per furnace than in 1901.

A MINING SCHOOL IN CHINA.—It is reported from Shanghai that the poular viceroy, Chang-chi-tung, contemplates founding a school of mines either at Wu-chang or at Han-yang. For this purpose the viceroy is thinking of procuring from Europe or America teachers who will undertake to stay at their posts at least for six years. In the coal and iron mines of Man-gan-shan, which is near to Han-yang, the pupils would have excellent opportunity for acquiring a practical knowledge of mining, as good modern machinery is in use there.

HOISTING ACCIDENTS IN GREAT BRITAIN.—The London *Colliery Guardian* of November 1 says: "An unhappy feature of the past few weeks has been the number of winding accidents throughout the country. Following upon the regrettable accident at Tirpentwys, where the rope broke, within the past few days accidents have occurred, at present from causes unknown, in Leicestershire, involving the death of two men, and in South Durham, where twenty-four men were severely shaken. At the Crump Meadow Colliery, near Cinderford, in the Forest of Dean, on October 24, an accident occurred which might have been attended with disastrous consequences. Before the men descended on Friday morning the management decided to run a trial trip, as some fettling had been done during the night. No sooner had the engine started than the rope ran over the flange of the winding wheel, fell upon the spindle, and broke at the point where it was joined to the wheel. Freed from control, the cage bolted to the bottom, a distance of 200 yards, where it was smashed to atoms."

ELECTROLYTIC EXTRACTION OF ANTIMONY FROM ORE.—I. Izart describes a process wherein the antimony sulphide of the ore is dissolved with sodium sulphide. The solution is electrolyzed in a vat divided by a diaphragm, the antimony solution being put in the cathode compartment while the anode compartment is filled with caustic soda solution to which sufficient ammonium chloride is added to raise the specific gravity to that of the antimony solution. In an experimental plant at Cassagnes, France, a scaly, lustrous deposit of antimony was obtained with a current density of 0.8 ampere per square decimeter and an electromotive force of 1.6 volts, the current efficiency being 76 per cent. (*L'Electricien*, 1902, XXII, i, 307, and ii, 33; *Journal Society of Chemical Industry*, XXI, 1237, October 15, 1902.) The practicability of the recovery of antimony from the ore by electrolysis of a solution of the sulphide in sodium sulphide was pointed out and discussed by Borchers in his *Elektrometallurgie* (vide Borchers and McMillan, *Electric Smelting and Refining*, 348 et seq.)

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

DUTY ON AND VALUATION OF STEEL BILLETS.—The Board of General Appraisers has affirmed the action of General Appraiser Jewell in the steel billet case. The billets, it will be recalled, were imported from Germany, were entered at Philadelphia and consigned to Milne & Co., Naylor & Co., and George B. Douglas, of New York. The merchandise was entered at about 76 marks per metric ton, advanced to about 97 marks by the customs authorities at Philadelphia, and appraised by Col. Jewell at 86 marks. When the case was pending before the general appraiser, the importers took the ground that the correct value of the billets, upon which duty should be assessed and at which they should be entered, was the price they actually paid for export in the open market. This price was far below the value fixed by the Philadelphia collector, who contended that the domestic or home market price in Germany should govern and not the wholesale or export price. His action had it been fully sustained, would have increased the duty from 0.3 cent per pound to 0.4 cent. General Appraiser Jewell's decision left the duty at the 0.3-cent rate, but accepted the home market price in Germany as the correct valuation.

The following statement has been made public, and may be accepted as the official statement of the Board:

"The testimony before the Board tended to show that the selling price to the consumers in the principal markets of Germany was more than the price for export. Following the decision of the Supreme Court in the Passavant case, the Board felt constrained to appraise the merchandise at its home market value, without regard to the price at which it was sold to purchasers. The decision of the Board will not work any serious harm to importers in this country, inasmuch as the appraised value does not carry the merchandise over the dividing line between the higher and lower specific duties provided for this class of merchandise in the tariff, which was the case in original appraisement by the local appraiser in Philadelphia. Under the law the Board have no discretionary rights, but are compelled to appraise the merchandise at its wholesale market value in the country of exportation. The Board were unanimously of the opinion that the steel billets in question were honestly invoiced at the prices actually paid therefor, but inasmuch as the German makers fixed the value for export less than for home consumption, they were compelled to appraise it at the higher price paid by the purchasers in Germany."

DUTY ON SALT IN HAITI.—Consul General J. B. Terres writes from Port au Prince, September 25, 1902, that, according to a recent decree, the collection of the duty on salt imported has been suspended from September 24 to December 31, 1902.

ABSTRACTS OF OFFICIAL REPORTS.

Tomboy Gold Mines, Limited, Colorado.

The report of this company covers the year ending June 30, 1902. The accounts, as stated in sterling from the London office, show a net profit from mine operations of £77,455. The general expenses, London office, etc., required £5,966, leaving a balance of £71,489; to which is added £17,174 brought forward from previous year, making a total of £88,663. From this there was paid £46,571 for dividends and income tax, and £41,000 for new property purchased; a total of £87,571, leaving a balance of £1,092 forward to the current year.

The returns from all the company's properties for the year show the following results:

	Total.	Per ton.
Tons ore mined and milled	85,726	....
Gold bullion yield	$856,065	$9.98
Working expenses	501,748	5.85
Net earnings	$354,317	$4.13

The present condition of the original property, the Tomboy Mine, is shown by a map which is reproduced herewith. The report of Manager J. Herron gives the following details of operations for the year:

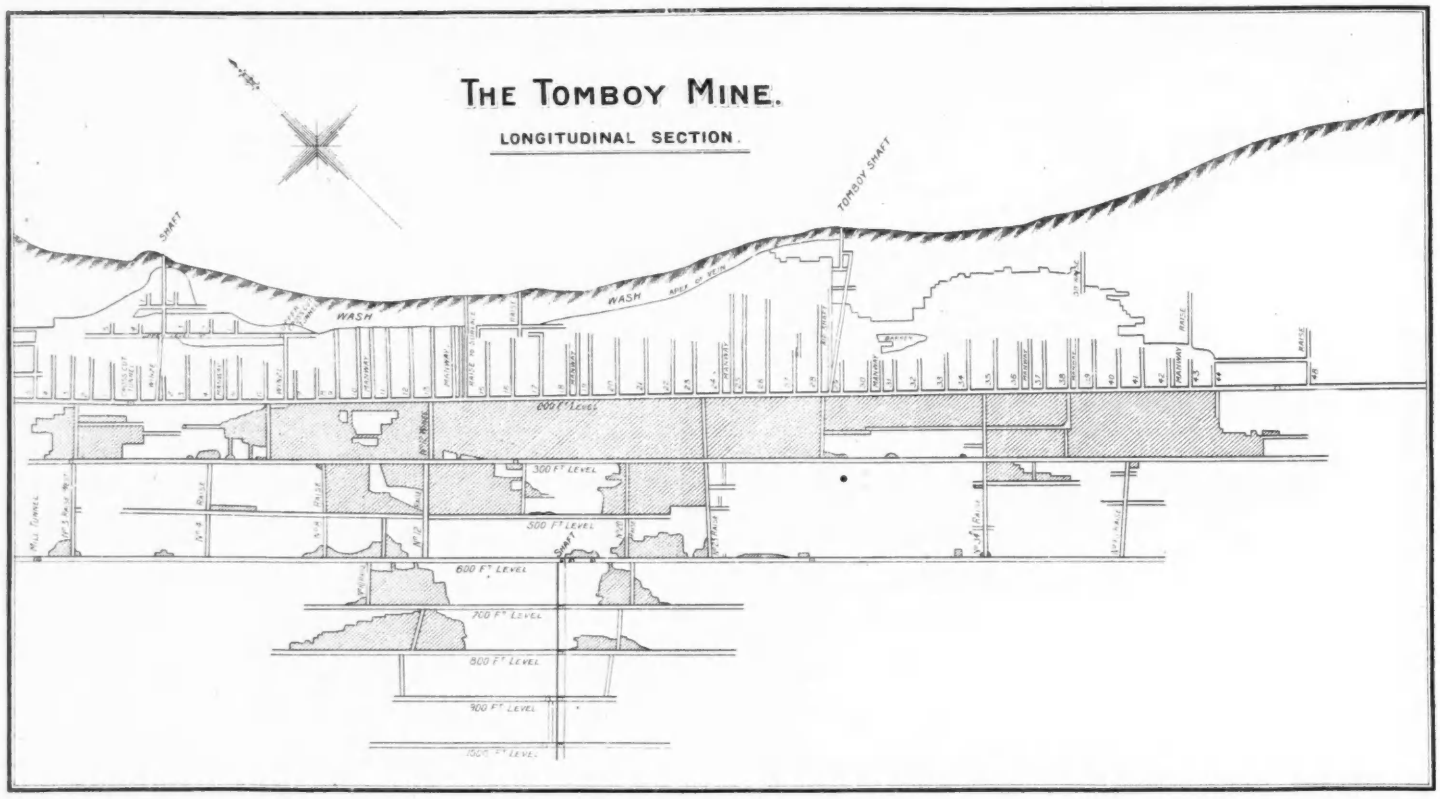
"*Tomboy Mine Proper.*—Our requirements in the new properties, purchased and under bond, made it necessary to limit, to a certain extent, development work in the old mine. Development work was as follows: Drifts, 1,357 feet; raises, 253 feet; cross-cuts, 28 feet. No additional ore-bodies have been opened up.

"Prospecting has shown the existence of better ore in portions of the mine than we had reason to expect, and there remains a considerable tonnage of ore which can be milled at a profit, though there is not now, as far as known, any high grade ore. Work in the bottom levels has been stopped until such time as we are able to use the Tomboy Mill entirely for the purpose of reducing the ores from the old mine. It has been found necessary to use a certain portion of the mill for the reduction of Argentine ore, and the consequent curtailment of tonnage crushed does not warrant us in prosecuting heavy development work. As soon as the new mill is completed we hope to resume active development work in the lower levels, and in other portions of the mine. During the year the Tomboy proper produced 48,644 tons of ore, which yielded $329,232, an average of $6.77 per ton, at an expense of $257,968; a profit of $71,264.

"*Argentine.*—This property has been actively operated during the year and the results have been highly satisfactory. In addition to active development work within the surface lines of the two Argentine claims, a tunnel, 135 feet below, has been run entirely through the Cincinnati Claim and Argentine No. 1 Claim, and into the Argentine No. 2 Claim. Two shafts have been sunk to the Cincinnati level; one, an extension of the old Kibbe Shaft, and the other one known as No. 2 Winze. The object of this work has been to prepare the ground for stoping, in connection with the operation of the new 60-stamp mill. The greater portion of this work was completed during the year and at the present writing little remains to be done in order to systematically mine the reserves opened up above this level. Our policy for the coming year in regard to this property is to extend the development on all the levels to the east, in order to prospect thoroughly the Red Cloud Claim, and also to commence the sinking of a shaft from the Cincinnati Level to prospect the vein in depth. During the year development progress on the claims comprising the Argentine group has been as follows: Drifts, 2,833 feet; shafts, 432 feet; raises, 287 feet; cross-cuts, 46 feet. In the same period this vein produced 35,408 tons of ore, yielding $534,797, an average per ton of $15.10, at an expense of $242,967, showing a profit of $291,830.

"*Columbia-Menona Group.*—This property was bonded in the month of March. The development for three months prior to June 30 consisted of 113 feet of drifts and 22 feet of raises. During the months of April, May and June there was produced 1,674 tons of ore, which yielded $10,557, an average of $6.31 per ton, at an expense of $10,435, showing a profit of $122. The expenses noted include straightening and taking up the floor of the old tunnel and drifts, relaying with new track and heavy rails, and running air and ventilating pipes into the workings.

"*Eldorado Group.*—Work from the surface on this group can only be done during the summer months. During the month of June the tunnel was extended 52



feet, and is still being carried forward as fast as possible. We have not met with the encouragement on this property that we had reason to expect from the appearance of the vein at the time the bond was taken.

"Construction Work.—The close of the fiscal year finds us with the work pertaining to the erection of a new 60-stamp mill, with the necessary mine and mill buildings, well advanced. November 1 should see the virtual completion of the work, and at that time it is hoped that all work pertaining to the opening up of the Argentine Vein from the Cincinnati Level will be completed, and everything in readiness for the crushing of ore."

Lehigh Valley Coal Company

This company owns and operates a large coal estate in the anthracite coal region of Pennsylvania. Its stock is practically all owned by the Lehigh Valley Railroad Company. The report covers the year ending June 30, 1902. The fiscal year having been changed, the statement covers part of the period included in the previous report, which was for the year ending November 30, 1901. The figures given are, however, for the full year.

The income account for the year may be summed up as follows:

	1901.	1902.	Changes.
Coal sales	$20,301,989	$19,484,661	D. $817,328
Rents, etc.	356,233	411,959	I. 55,726
Total receipts	$20,658,222	$19,896,620	D. $761,602
Min. and pur. of coal	$12,811,376	$12,412,461	D. $398,915
Transporting coal	7,405,891	6,997,002	D. 408,889
Handling and selling	566,465	595,265	I. 28,800
Miscellaneous	64,956	66,667	I. 1,711
Total expense	$20,848,688	$20,071,395	D. $777,293
Deficit	$190,466	$174,775	D. $15,691
Interest	64,654	73,450	I. 8,796
Improvements	397,126	320,457	D. 76,669
Net loss	$652,246	$568,682	D. $83,564

The item of mining and selling coal last year was made up as follows: Coal mined, $5,940,297; coal purchased, $6,016,956; coal sold from stock carried over, $455,208.

The total production of anthracite coal from the lands owned or controlled by the Lehigh Valley Coal Company and the minor companies in which it and the Lehigh Valley Railroad Company are interested through the ownership of stock was as follows, for the year:

	1901.	1902.	Changes.
Lehigh Valley Coal Co.	3,323,977	3,049,755	D. 274,222
Tenants of Co.	1,281,544	1,250,302	D. 31,242
Other tenants	1,173,646	1,320,815	I. 147,169
Totals	5,779,167	5,620,872	D. 158,295

The effect of the strike was, of course, felt for only a small part of the year.

The report says: "The decrease in the tonnage for the above period was occasioned by the disastrous floods of last winter, which caused a suspension of operations, both with the railroad company and the coal company, for an extended period, and the general strike, which has altogether suspended mining operations in the anthracite regions since May 12, 1902.

"The tonnage for the year ended June 30, 1902, was transported to market over the Lehigh Valley Railroad system, with the exception of 225,410 tons.

"The daily capacity of the collieries operated by the Lehigh Valley Coal Company averaged 19,616 tons for the year just closed, as compared with 18,117 tons for the previous year. The cost per ton of coal mined and purchased was $2.0974, as compared with $1.9287 in the previous year; an increase of $0.1687. The cost of mining at the collieries operated by the Lehigh Valley Coal Company includes, in addition to the regular mining expenses, all charges to general expense, royalty, sinking fund, insurance, taxes, depreciation and improvement account.

"During the year there was expended at the anthracite mines $320,457 for colliery improvement work, which amount, in addition to a depreciation charge of 5 cents per ton, amounting to $152,488, for reduction of the old improvement account, was charged directly to cost of mining. The sinking fund under the terms of the mortgage of 1892 has been increased since November 30, 1901, $30,955, and now amounts to $608,170. This additional amount will be paid, when due, to the trustees under the mortgage, for the purchase and cancellation of bonds."

Concerning the coal movement over the Lehigh Valley Railroad, the report says: "From May 12 to June 30, 1902, an inconsiderable tonnage of anthracite coal was moved over your railroad, the cause being a strike of the employees of the collieries located on your main line and branches, and whose output is ordinarily transported to market over your lines. The period covered by the strike, embraced in the fiscal year just closed, was somewhat longer than that of a similar strike in the previous fiscal year, and the loss of gross revenue was greater, being estimated at $1,920,000 up to June 30. A further loss in revenue, estimated at $700,000, was caused by heavy floods during the winter, of which mention has elsewhere been made in this report.

"The earnings from transportation of anthracite and bituminous coal were $9,328,959, a decrease as compared with the previous fiscal year of $307,843, or 3 per cent. The total tonnage earning revenue amounted to 8,923,446 net tons, a decrease of 756,118 net tons, or 7.8 per cent. In addition, 1,459,931 net tons were carried for company's supply, and 1,979,133 net tons were hauled by other carriers over your tracks, making a grand total of 12,362,510 net tons moved, a decrease of 1,022,685 net tons, or 7.6 per cent. The average revenue per ton hauled on your trains was 104.54 cents, an increase of 4.98 cents, or 5 per cent."

Central Chile Copper Company, Limited.

This company, which is a reorganization of the old Panulcillo Copper Mines, has just published its report for the year 1901. The accounts, as stated in sterling from the London office, show net profits from mining of £11,565. Interest and general expenses amount to £8,193, leaving a net balance of £3,372.

The report says: "The directors have to call attention to the fact that the course of Chilean exchange for that period has again been adverse, and has absorbed the sum of £5,250 out of the profits of the company's operations. For the year 1902 so far we have not had this drawback to contend with. At the annual meeting of last year the chairman informed you that one water-jacket furnace had been set up at Panulcillo, and that it was then in contemplation to erect a second; this has been done, and also a third similar furnace. The cost of these important additions to our smelting plant has been mainly charged against profits. There has also been incurred a considerable expense in filling in the old Paja stopes, which required for that operation many thousands of tons of debris to be handled; the work was a pressing necessity, and could not longer be delayed with a view to the safety of the lives of the miners employed.

"The new mines that have been commenced, and that are now at work, are the Tesoro, Nesniles, Emporio and Yankee, from which the manager informs us he anticipates to report good results at no distant date. The Inagotable mine continues to be a profitable undertaking. Considerable other heavy mining work has also been done during the period under review. The average tenor of the ores produced for the year was nearly equal to that of the 12 months preceding, although at the different points of working variations had occurred. As a result of the heavy amount of development work done at the mines and the extension of the smelting plant, the directors hope that the output of copper will be maintained, and the cost of production reduced.

"The directors having carefully considered the results to date of the company's business in Chile during 1902, have concluded that although the earnings might permit of the payment of an interim dividend, it would be more prudent for the present to husband the cash resources of the company."

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.

Progress of the Mineral Industry of Tasmania. 1902. W. H. Twelvetrees, Government Geologist. Hobart, Tas.; Government Printer. Pages, 16.

Mineral Resources of Kansas. 1900-1901. By Erasmus Haworth. Lawrence, Kan.; University Geological Survey. Pages, 80; illustrated.

United States Navy. Annual Report of the Bureau of Steam Engineering. 1902. Rear-Admiral George W. Melville, Chief of Bureau. Washington; Government Printing Office. Pages, 192; illustrated.

Commercial Relations of the United States with Foreign Countries. 1901. Volume II. Prepared by the Bureau of Foreign Commerce, Department of State. Washington; Government Printing Office. Pages, 984.

Across Siberia by Rail. A Trip to the Amur Goldfields. By David A. Ruffman. London, England; Reprinted from the *Pall Mall Gazette.* Pamphlet, 34 pages.

Handy Electrical Dictionary. Compiled by W. E. Weber. Chicago; Frederick J. Drake & Co. Pocket size, 224 pages. Price, 50 cents.

Die Geschichte des Eisens in Technischer und Kulturgeschichtliche Beziehung. Fifth Part. By Dr. Ludwig Beck. Braunschweig, Germany; Friedrich Vieweg & Sohn. Pages, 188; illustrated. Price (in New York), $1.75.

Recherches sur les Aciers un Nickel à Hautes Teneurs. By M. L. Dumas. Paris, France; Veuve Ch. Dunod. Pages, 208; illustrated. Price (in New York), $2.

BOOKS REVIEWED.

The Analysis of Steel-Works' Materials. By Harry Brearley and Fred Ibbotson. London and New York, 1902; Longmans, Green & Co. Pages, 501; illustrated. Price, $4.25.

In addition to the dedication, preface, contents, etc., this work consists of thirteen parts and an appendix. The former are as follows: I. Analysis of Steel. II. Analysis of Pig Iron. III. Analysis of Steel-making Alloys. IV. Rapid Analysis at the Furnace. V. Analysis of Ores. VI. Analysis of Refractory Materials (Acid, Basic and Neutral). VII. Analysis of Slags. VIII. Analysis of Fuel. IX. Boiler Water, Boiler Scales, etc. X. Analysis of Engineering Alloys. XI. Micrographic Analysis of Steel. XII. Pyrometry. XIII. Miscellaneous Notes. It will be seen from this that the book contains several original features. It is commendable in the authors to have introduced at several places explanatory portions to give the analysts some conception of the actual constitution of the substance he is dealing with. For the first time, too, we see micrographic analysis included in the same book with chemical analysis, and even a chapter on pyrometry is added in order to assist the works analysit in understanding the physics of steel as well as its chemistry. A relatively large amount of space is devoted to the analysis of ferro- and steel-alloys. This seems fitting, owing to the increased number and importance of these materials.

A first glance at this work leads us to hope for great things to be found in its 500 pages, but we must confess to considerable disappointment after a more thorough perusal of it. The authors say their work is intended particularly for use in the large and busy works' laboratories, and their reason for writing it is that other books give methods "which are too long and laborious," or which "require too delicate manipulation," or which "are not sufficiently accurate." We think these statements are too strong entirely, but will admit the validity of their fourth reason for giving us a new text-book, that existing ones are "too scanty in their treatment of the new materials of steel making."

The analytical methods given in Messrs. Brearley and Ibbotson's book have been tested by them personally and by others, and hence we may assume that they have been found trustworthy. As an introduction to the methods of determining each element, a somewhat critical review of all the other leading methods is first given. The descriptions of the methods themselves, which the authors recommend and which have been tested by them, are not given in sufficient detail. Particularly unsatisfactory are their directions for making and standardizing, and precautions for using, volumetric solutions.

Of the 112 pages which comprise Part I, about one-half are devoted to the determination of the five elements oftenest required in a steel analysis. No detailed colorimetric method is given for determining either carbon or manganese. The direct combustion of carbon, in which the drillings are strongly heated in a tube with lead oxide or chromate in a current of air or oxygen, is given first place among the methods for determining carbon. The method is said to be suitable for steels and most ferro-alloys. A good high heat is absolutely necessary in carrying out this method successfully, but when once attained, 20 minutes burning is sufficient, followed, of course, by the passage of two or three liters of air. The latter half of Part I and all of Part III—64 pages—are devoted to the analysis of ferro-alloys and the steels made from them. This forms a very valuable addition to our knowledge of the chemistry of these materials, and is about the most valuable feature of the book. Not only are methods for the determination of such elements as chromium, nickel, tungsten, vanadium, silicon, tetanium, molybdenum, etc., given, but the determination of the other elements usually looked for is described as affected by the presence of one or more of the above.

The authors seem to have had unfortunate experiences with molybdenum steel, ferro-molybdenum, and molybdenum metal, and their opinions upon the subject seem to fairly represent those of the British steel men. They appear never to have seen any good molybdenum metal or ferro, and even doubt that the remarkable physical properties of molybdenum steels are due to molybdenum at all. Under the analysis of engineering alloys is included the examination of copper for impurities, and its alloys with tin, zinc and aluminum; the analysis of white metals is discussed, and the authors have aimed to give methods for the direct determination of single elements without making preliminary separations. A method which was originated by the authors and to which reference is made in several places in the book, is, we venture to think, unfamiliar to most American chemists. We refer to the method commended for the direct determination of lead and molybdenum, and, indirectly, for the determination of phosphorus. The peculiarity of the method consists in the fact that lead molybdate is precipitated in the presence of soluble chlorides, if there be also an excess of ammonium acetate added to destroy the free hydrochloric acid which may be present. By this method it is said that molybdenum can be precipitated in the presence of copper, cobalt, nickel, manganese, zinc, magnesium, mercuric salts, the alkaline earths, uranium, arsenic, cadmium and aluminum. This method is also recommended for the determination of phosphorus,, but we do not think it will appeal to most chemists when they read that the ammonium phospho-molybdate is converted into a compound whose formula would correspond to the formula $Pb_3(PO_4)_2.24\,PbMoO_4$—"on the assumption that all the phosphorus is precipitated as lead phosphate." But though, under the described conditions, it is said that "only a portion of the phosphorus is precipitated," the deficiency introduces no "appreciable error."

The part of Brearley and Ibbotson's work which deals with the microscopical analysis of steel covers 40 pages, and presents a very good introduction to the subject. The 46 illustrations are excellent microphotographs, representing the best work of Sorby, Arnold, Stead and Osmond. Mr. A. L. Colby's bibliography of the metallography of iron and steel, containing about 200 titles, is reprinted.

A concise chapter upon pyrometry, contributed by Mr. A. McWilliam, describes the Le Chatelier pyrometer and its use in revealing the "critical points" and molecular changes in steel. The principles are clearly stated and illustrations are given.

Part XIII is entitled "Miscellaneous Notes." They are. A glance at them suggests specimen pages from an encyclopedia. The topics range from "Sash Cords" and "Bottle Labels," to a review of Carnot and Goutal's chemical investigations upon the "Constitution of Iron and Steel," and an abstract of Franz Hundeshagen's paper on the determination of phosphorus as molybdate. In one note the authors say that platinum Gooch crucibles are too expensive for every-day use. Even if there were not porcelain ones to be had, we do not agree with this policy. In the "large and busy works laboratory," for which this book is intended, the best is none too good, in the way of laboratory equipment, if time can be economized.

An abbreviated table of "Approximate Atomic Weights" is given, and a still shorter table of melting points of the elements, several of which are not even approximately correct.

Mr. Brearley's *Bibliography of Steel Works Analysis* is reprinted from the *Chemical News* as an appendix. It includes 1,858 references compiled from the *Chemical News,* and the *Journals* of the Chemical Society, the Society of Chemical Industry and the Iron and Steel Institute. Under each reference the author states briefly its subject and scope, and the references are very carefully classified. While this feature of the book is one of great importance and usefulness, the compiler of it admits the "serious bibliographical error" of having omitted the titles of original articles and the places where they are to be found, unless perchance they occur in the four British journals mentioned above. The book throughout is too English; the authors have paid little attention to American methods, and these omissions can hardly be excused on the grounds that our "foreign journals would be unintelligible to many analysts." It is a great pity that throughout the first ten parts of this book cross references to Mr. Brearley's bibliography were not included, in order that their statements and methods might be connected with the authorities for them. The value of the book would have been greatly enhanced by this means, particularly to the student and investigator.

Typographically, Messrs. Brearley and Ibbotson's book presents an excellent appearance. The paper is of good weight and surface, the type clear and the illustrations all that could be desired. Its greatest value, taken as a whole, lies in its new features. For descriptions of the old and tried methods and for concise statement of analytical details, precautions and exact conditions for accuracy, the work is not up to the standard expected or required.

J. A. MATHEWS.

CORRESPONDENCE.

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

The Mexican Pertenencia.

Sir: Referring to enquiry in your issue of November 1 as to a Mexican pertenencia, I would enlarge the definition given.

A Mexican pertenencia is a single indivisible mining claim and is the official unit of area for mining ground. Where possible it must be a rectangle, 100 meters by 100 meters, but in any case must contain 10,000 square meters. It is bounded by vertical planes. It is the smallest area which may be located on ground not already limited by surrounding locations. The possession of a pertenencia gives no right to the surface ground within its boundaries. An annual payment of $10 Mexican currency, payable to the Federal Government is required to hold each pertenencia in Mexico.

Mining property in Mexico differs from that in the United States in this principal respect. A United States patent gives absolute perpetual possession, while a Mexican title to a pertenencia is simply a lease of the underground, which is forfeited three months after failure to pay the rent.

JAMES W. MALCOLMSON.

Too Much Generosity.

Sir: Judging from the number of prospectuses and circulars I am receiving from agents of "gold mining" companies and "pools," it seems that I have at last been found out; that it is useless to any longer pose simply as a hard-working mining man, dependent for his living upon his daily toil. I may as well admit that I am a rich and "easily worked proposition" in disguise, and prepare to shell out.

But before proceeding to divide my surplus with the various "companies," "pools" and "trustees," I feel that I should arrange to do so in a just and equitable manner. There may be some of these mining propositions that are not quite so bad as others, and do not, therefore, need quite as large a share of my wealth as the others; hence, when I begin the distribution I ought to be able to do so in an intelligent way. To that end, I ask your assistance.. You will understand that although, as will appear, there may be a shade of selfishness in my purpose, it is also philanthropic; my desire is to apportion my surplus among these deserving "pools," "trustees" and "companies" in such way that each one may receive its proper share. I care nothing for the gold it is proposed to give me in return for present help. Although evidently unperceived by these unfortunate "pools" and "trustees," it is clear to me, from confidential information given in some of these circulars, and the general tenor of all, that gold is soon to become so common and so cheap that only "gold bugs" hopelessly set in their ways will care to have it.

It seems that rich gold veins are now being found everywhere and anywhere—they are even "turning up" almost every day right here in Kentucky; that they seldom run in sets of less than five on each property; that each one splits the earth indefinitely; that new districts are being discovered constantly, each one richer than any previously known one—the conclusion being plain that a great belt of solid gold will after a while be discovered; and that costs of mining and milling are now almost too small to mention. Indeed, in some instances they are not mentioned. A gold vein which costs more than $1 per ton to mine (which, I gather from figures given me, includes labor, supplies, timbering, lighting, ventilating, draining, hoisting, hauling, etc.), is a rare thing nowadays; all veins "look alike" (as to mining costs) in these progressive times; and there is no longer any wear and tear, or interest account, to be provided for; while costs of administration, and such old-time inconveniences, have been entirely eliminated. Evidently the happy days of something for nothing have almost arrived; but even such conditions in gold mining have their disadvantages—they render gold too dirt cheap. It will soon be too common a metal for a Kentucky gentleman to associate with. It is, therefore, with a sense of gratitude that I receive these offers from the "pools," etc., to relieve me. Hence it is that my design has a two-fold purpose. On the one hand, it will enable me to exchange cheap, common gold (or its equivalent) for good, solid brass (which is paying better) before the crash comes, and on the other, it will enable me to contribute toward replenishing the treasuries of the various branches of that unselfish, struggling class of philanthropists—the Professional Promoters. But I wish to do the thing right, and ask your assistance. As a starter, what do you think of the enclosed? Should I list it with the merely needy, or with the very needy?

C. J. N.

Lexington, Ky., October 30, 1902.

(Our opinion of the enclosed is that you ought to

decline the offer entirely. It is too philanthropic, and people who have such a good thing and want to give it away should not be allowed to rob themselves.—EDITOR E. and M. J.)

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.

Titanium Ore.—I have a large amount of ore carrying about 29 per cent titanium with iron. Is there any market for this material?—E. P. H.

Answer.—There is at present no market for titanium ore to be found anywhere.

Mica.—What physical properties are necessary in the best electric mica? In what electrical machines and in what parts of them is the mica used? Can you give me an idea of the thickness to which commutator mica should be split?—G. C. I.

Answer.—1. The physical properties required in "electric mica" are freedom from foreign substances, particularly oxides of iron.

2. Mica is used in dynamo and motor commutators, brush bushings and washers and for special insulation.

3. Commutator mica should be split to a thickness of 0.03 to 0.04 inch for ordinary machines, and 0.05 to 0.06 inch for large machines.

4. It is necessary that mica for electrical purposes shall be absolutely pure. The best electrical mica comes from India, but there is one deposit in North Carolina which is largely used for electrical purposes, although it does not show as high insulation as the India mica. This is, however, largely used for commutator work, one reason being that it can be worked mechanically somewhat better than the Indian mica.

A MODEL MANUFACTURING PLANT.

The Lunkenheimer Company, of Cincinnati, Ohio, manufacturers of brass and iron goods and specialties for engines, boilers, etc., on Saturday, October 25, formally opened the new works to about 3,000 visitors and friends and are now moving from the old quarters. The buildings, of which there are five, representing an investment of over $300,000, consist of the main building occupied by the brass department with adjoining buildings for the iron department, brass foundry, power building and office building; all are of pressed brick and steel construction of modern type. They occupy about three acres of ground and have switching facilities; three acres additional ground provide for future extension of the business. These factories are located near Brighton Station in a section of the city called Fairmount, within two miles of the center of the city. It has been the aim of the company to construct the model plant in this industry and many new and interesting features are noticeable. The main building, 130 by 180 feet, is of gallery style construction with a center area measuring 30 by 80 feet; is three stories high and built so that three more stories can be added without interfering with the operation of the business. The elevators and iron staircases are arranged within the center area. All buildings are designed for 300 pounds per square foot floor load. The roofs are glass and clay tiling of Ludowici interlocking type.

A novel feature in the main building is the heating system. The hot air travels through the 14 large hollow columns which support the floors around the area in the center of the building. These columns have openings on each floor to distribute the air; the bases of the columns are connected with a fan by means of tunnels under the basement floor. By this construction the usual galvanized iron air pipes are done away with.

The type of window used is a novel one, and has a blind arrangement that is of great advantage during summer weather. The foundry is equipped with modern appliances such as overhead track system for carrying material, smelting furnaces burning crude oil and many pneumatic appliances, such as are used in the latest foundry practice. The general distribution of power throughout the buildings is the latest. The source of energy is a 300 horse-power compound engine which drives a 240-kilowatt, three-phase, 220-volt General Electric alternating current dynamo. The current is led out from a switchboard to the different parts of the buildings where suitable motors (principally attached to the ceiling) are provided to drive the various lines of shafting. These motors are of the Westinghouse and General Electric induction type without commutators or brushes. The power from the motors to the shafts is transmitted through what is known as the Renold silent chain gear, which permits a very compact arrangement without noise and friction, thus dispensing with leather belts.

The engine room is provided with a large cross-compound two-stage, Laidlaw-Dunn-Gordon air compressor, which supplies compressed air throughout shops and foundry for driving pneumatic tools, hoists, etc. The boilers are of Babcock & Wilcox pattern with automatic-stokers. The engine room, the floor of which is laid in mosaic tiling, is considered one of the handsomest in the country.

The illumination is furnished by Nernst lamps made by the Nernst Lamp Company, of Pittsburg. Owing to the arrangement of the lamps, the distribution of the light is absolutely even and without shadows. The lamps are so arranged that sufficient illumination is secured without providing each operator with an individual light.

The office building is a three-story press brick structure 50 by 80 feet, with modern equipment, the second floor being occupied by the drafting and engineering departments, the third by the advertising department, as well as a laboratory and photograph gallery.

The business was founded in 1862 by the late Frederick Lunkenheimer and has grown to large proportions, now employing over 700 men. With increased facilities the company expect to extend its line and take up many new engineering specialties. The company have placed many orders for additional tools and machinery, which are being installed in their new quarters.

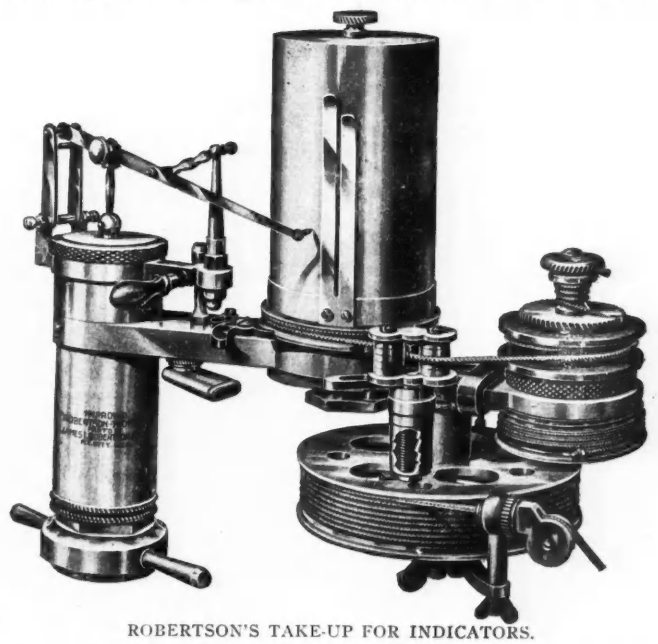
A TAKE-UP DEVICE FOR INDICATORS.

The great trouble experienced when using the detent on the steam engine indicator is that of the slack given up by the cord between the paper drum and reducing bushing on wheel. This slack if not properly guided when throwing on detent is liable to get foul, thereby in many instances wrecking the instrument or at least breaking the cord, causing delay and inconvenience to the operator. The take-up device is presented for the purpose of doing away with all this annoyance. It is simple in its construction, and can be applied to any standard indicator.

It consists of a short horizontal arm, at one end of which is a vertical bearing, in which sets a steel pillar on the upper end of which there is a frame holding a double set of loose steel rollers —between those the cord from paper drum passes. On the lower end of vertical pillar there is a light spiral spring enclosed. This spring causes the upper frame to revolve when the cord becomes slack and is so arranged that cord winds on frame, to be given up again when tension is applied.

The object of the device is to permit the operator to take as many cards as desired without unhooking from the crosshead or stopping the engine, no matter what speed. This, of course, pertains to indicators that are fitted with a detent and using a direct connected reducing motion, the latter being by long odds the most popular in modern engineering practice.

Where an indicator is used in connection with



ROBERTSON'S TAKE-UP FOR INDICATORS.

pendulum, lazy tongs or reducing motion attached to engine frame, not so much trouble arises; and generally a rubber band is employed to take care of slack cord, which works fairly well. In this case the take-up device has been arranged in the shape of a regular guide pulley to connect direct to indicator. The guide pulley is removed and this device put in its place, wound up, and it is ready for use. This can also be used with satisfaction as a guide pulley if not needed to take up slack cord, as the little pulleys are arranged to let the cord run through with perfect freedom, and immediately the detent is engaged it picks up instantly what slack cord takes place. The tension of the spring in this device, being so much weaker than the drum spring, as soon as detent is disengaged the cord is instantly released and drawn out taut, and then assumes its regular position.

The take-up device is also attached to engine frames and used in various other ways. It is strong, well made and compact, and makes a very attractive attachment. It is good for any number of revolutions, and is designed to fit all standard indicators and reducing wheels; or it can be made as a special fixture. The manufacturers are Jas. L. Robertson & Sons, of New York.

COBALT ORE.—In consequence of the increased demand for cobalt and cobalt salts, according to *Chemiker Zeitung* of October 22, 1902, the price of cobalt ore in New Caledonia has risen greatly. Ore assaying 4 per cent cobalt oxide, which formerly sold for 130 francs per 1,000 kilograms, now fetches 330 francs. There is active exploration for new deposits of the ore.

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.

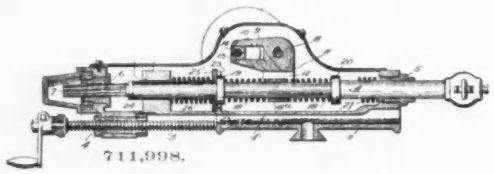
Week Ending October 28, 1902.

711,939. VALVE MECHANISM FOR COMPRESSORS.—James A. Coombs, Llangollen, England. In a fluid compressor, pump, or motor, valves for controlling the flow of fluid to and from the cylinder; a valve-actuating cylinder and piston operated by fluid under pressure connected with said valves; detents working in connection with said valves for controlling the time of movement of same, and mechanism operated from the compressor, pump or motor, adapted to operate said detents.

711,965 and 711,966. PUMP.—Eli E. Hendrick, Carbondale, Pa. In a pump, the combination with a casing, of a shaft having propellers mounted thereon, hubs through which said shaft passes, arms extending from said hubs and coacting directly with the interior of the casing, and means for exerting yielding pressure upon said hubs

711,995. PROCESS OF MANUFACTURING ARTIFICIAL FUEL BLOCKS.—Albert D. de Micheroux, Marseilles, France. A process of mixing gas-tar with a compound of lime and caustic soda, and with organic acids in the form of fat, the lime-soda compound having first been ozonized, heating and agitating said mixture, and when cool, mixing same with a suitable combustible waste material such as coal-dust or fragments of mineral and chemical substances such as form the residues of ores, oxides, sulphides, pressing same into blocks.

711,998. BUFFER DEVICE FOR ROCK-DRILLS.—Robert B. McConney, Denver, Colo., assignor to the Mine & Smelter Supply Company, Denver, Colo. In a recoil bumper device for rock-drills, the combination of the casing, the crank-arm, the cross-head, the drill-holder and the drill-holder's actuating-springs, and the actuating-springs'



711,998.

abutment-collars of the two transversely-arranged abutment-collars arranged at a short distance apart at the rear end of said drill-holder, and axial apertures arranged co-eccentric to said drill-holder, the sleeve secured between the rear end of said drill-holder and the rear abutment-collar of said drill-holder, the washer mounted loosely on said sleeve and the coiled compression-spring arranged and adapted to bear at one end against one of said casing's abutment-collars and to expansively hold said washer against the other.

711,999. QUICK-RETURN SPRING FOR ROCK-DRILLS. Robert B. McConney, Denver, Colo., assignor to the Mine and Smelter Supply Company, Denver, Colo. In a quick-return device for drill-holder-actuating springs, the combination with the casing, the actuating-lever and cross-head, the drill-holder and forward actuating-spring, of a flanged collar rigidly secured upon the forward portion of the drill-holder; a washer loosely mounted upon the said drill-holder, at the rear of said collar, a spring interposed between the said collar and washer, which holds the said washer against the forward end of the said actuating-spring, thus holding the rear end of the actuating-spring in constant engagement with the cross-head.

712,002. SUBMARINE ROCK DRILLING AND BLASTING APPARATUS.—Ralph G. Packard, Morristown, N. J. In a submarine drilling apparatus, a float suitably anchored in combination with a column connected with said float by a flexible and sliding connection and resting in a substantially vertical position on the bottom with a drill-operating mechanism mounted on said column and means to operate the same.

712,027. ALLOY OF SILVER.—William H. Walker, Newtonville, Mass., assignor to Towle Manufacturing Company, Newburyport, Mass. A workable annealed alloy of silver containing copper, or other oxidizable metal, and free from fire-surfaces during and after the completion of the process of annealing.

712,051. CLAY PULVERIZER AND SEPARATOR.—James Elliott, Wingham, Canada. The combination with a receiving bin or hopper having downwardly-converging sides and a bottom discharge, of a pair of spirally-grooved rollers, lower grooved rollers, driving and operating gears, scrapers, other scrapers disposed at right angles to the first ones and fixed vertically-disposed finger-scrapers.

712,053. CONVERTER-TUYERE.—William A. Field, Chicago, Ill. A tuyere provided with channels or openings whose inlet ends are flared and have bell-shaped mouths and whose outlet ends are in the form of inverted frustums.

712,073. PRESS FOR MAKING BUILDING OR PAVING BLOCKS FROM PLASTIC MATERIALS.—James A. Joyce, Cleveland, Ohio. In a block-pressing machine having a revolving disk provided with a plurality of mold-holes, and means of feeding the same, an oscillating eccentric supported upon a shaft, a ratchet and pawl acting in conjunction with said oscillating eccentric to revolve the disk, a shaft supporting pressing toggle-bars, a pressing-plunger connected to the said pressing toggle-bars, a support under the disk forming a bottom for the said mold-holes, an eccentric supported upon a shaft and acting in conjunction with the pressing-toggle to raise and lower the plunger for pressing the blocks.

712,111. LADLE-STOPPER.—John H. Allendorfer, Westmont, Pa. A refractory stopper provided with a threaded metallic nut secured therein, and a hole communicating with the threaded opening of the nut aforesaid, a stud-bolt adapted to be screwed into the nut aforesaid, and a stopper-rod having a threaded hole arranged to receive the other end of said stud-bolt, whereby said stopper is secured to said stopper-rod.

712,153. METHOD OF AND APPARATUS FOR ELECTRODEPOSITION OF METALS.—Charles J. Reed, Philadelphia, Pa.—An electrolytic apparatus comprising a mixture of a liquid electrolyte and an inert or non-conducting granular substance in combination with two electrodes or sets of electrodes one of which receives the metallic deposit and is movable in the mixture.

712,161. REDUCTION-FURNACE.—Henry E. Vosburgh, Auburn, N. Y. A furnace having a combustion-chamber and a stack extending into the combustion-chamber for the purpose described, said chamber and stack having passages connecting their interiors, and a closure for the passages.

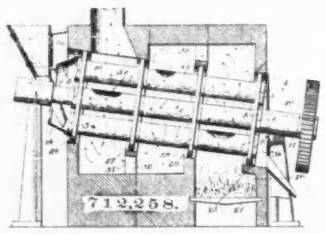
712,218. ELECTROLYTIC CELL.—Arthur E. Truesdell, Pittsfield, Mass. The combination in an electrolytic apparatus, of a vat, a fluid-metal cathode, a container therefor, a suitable anode, a source of electricity, suitable connections from said surce to said cathode and anode, whereby, under operative conditions, an amalgam may be formed on said cathode, a channel having an inclined bottom at the side of said container, means for removing said amalgam to said channel, an outlet from the lowest point in the latter and a trap in said outlet.

712,225. PROCESS OF OBTAINING CALCIUM SUPPHATE AND BY-PRODUCTS.—Herbert H. Wing, New Brighton, N. Y. A process of obtaining calcium sulphate and a by-product which consists in subjecting any compound of magnesium decomposable by sulphur dioxide in the presence of moisture to the action of sulphur fumes containing sulphur dioxide and air in the presence of moisture, whereby the sulphite and sulphate of magnesium are produced; then exposing such mixture to oxidizing conditions whereby the sulphite is converted into sulphate; then adding the sulphate to a solution of calcium chloride whereby magnesium chloride and calcium sulphate are produced; then separating the insoluble calcium sulphate from the liquor in which it was produced; then adding lime to the magnesium chloride which remains in solution in said liquor, whereby calcium chloride and the by-product magnesium hydrate are produced.

712,226. PROCESS OF OBTAINING ALUM.—Herbert H. Wing, New Brighton, N. Y. A process of obtaining alum which consists in bringing sulphur fumes containing sulphur dioxide and air into contact with a solution containing sulphate of copper, thereby liberating sulphuric acid; neutralizing the sulphuric acid thus set free by the oxide or hydrate of aluminum, whereby the sulphate of aluminum is produced; then breaking up the copper compound by separating the copper therefrom and leaving the sulphuric acid with which it was combined in the solution; then neutralizing said acid by adding the oxide or hydrate of aluminum, thereby obtaining a solution containing substantially sulphate of aluminum only.

712,230. COMPOUND FOR CLEANING AND SOLDERING METALS.—Jesse H. Young, Fort Wayne, Ind. A composition consisting of water, ammonia, sal-ammoniac, and potassium cyanide.

712,258. DRIER FOR ORES, ETC.—Alfred G. Campbell, Sherbrooke, Canada. In a mechanical drying apparatus, a plurality of imperforate, open-ended cylinders, circular heads having apertures to receive the cylinders, the latter being axially arranged about a common longitudinal center,



712,258.

a heating-chamber in which the cylinders are inclosed, said chamber having circular openings to receive the said heads, the latter substantially closing the said openings, means to direct a heating medium to the exterior of the cylinders, and means located exteriorly to the heating-chamber to rotatably support the group of cylinders.

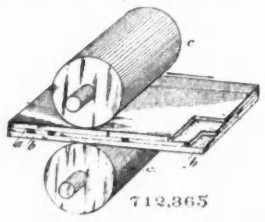
712,235. FURNACE-BLOWER.—Henry R. Arthur, Longmont, Colo. The combination of a cooling-chamber having a perforate top, a condensing-chamber concentrically disposed in the cooling-chamber and projected upwardly through the top of the latter, the lower end of the condensing-chamber being above the bottom of said cooling-chamber, a foraminous cap fitted over the upper projecting extremity of the condensing-chamber, a steam-injecting nozzle extending upwardly from the bottom of the cooling-chamber into the condensing-chamber and having a steam-supply pipe connected thereto, and a drip-pipe eccentrically attached to the bottom of said cooling-chamber.

712,251. LIMEKILN.—Albert P. Broomell, York, Pa. In a kiln a stack, a cooler, pendently joined with the lower end thereof, a metallic shell surrounding the stack and the cooler and extending to the ground, a furnace connected with the stack by a flue, said flue extending through the shell.

712,335. CONVEYOR.—John Roger, Denver, Colo. The combination of an orbitally-movable feed member, and a counterbalancing device supported independently of the feed member and operatively connected thereto.

712,356. DREDGE.—Alphonse Z. Boudreaux and Oliva F. Eschet, Donner, La. In a dredge; the combination with the bucket-boom, the bucket provided with a latch-closed drop-door; of a latch-operating rope or cable joined at its inner end to a fixed member, guides on the boom and boom-frame for the said rope or cable, the outer end of said rope or cable being connected to the bucket-latch, and a means for automatically taking up the slack of the latch-controlling rope or cable.

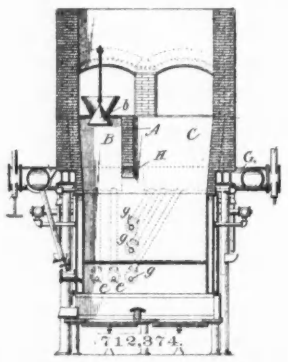
712,365. PROCESS OF HARDENING METALS.—Johanny Dejey, Lyons, France. A process of hardening sheet metal, which consists in interposing the sheet to be hardened be-



712,365

tween two unpolished plates of a different metal having a temperature of malleability greater than that of the sheet to be hardened, and then subjecting said sheet and plates to a slow progressive compression action.

712,374. SMELTING-FURNACE. William F. Hannes, Deming, N. Mex., assignor of one-half to Walter J. Browning, Deming, N. Mex. In a furnace, a partition extending from the upper part thereof part way toward the bottom, whereby a fuel-compartment, having communication at its

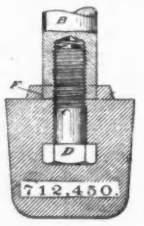


712,374.

lower end with the body portion of the furnace, is formed, means for supplying fuel to the fuel-compartment, means for supplying ore to the body portion, and means for supplying oxygen to the fuel below said compartment and to the ore in the body portion above the level of the first-named oxygen-supply.

712,389. PROCESS OF MANUFACTURING STEEL.—Henry Knoth, Birmingham, Ala. Improvement in the continuous open-hearth process, consisting in reserving a predetermined amount of molten refined metal from a previous heat outside of the furnace in which it was refined, and introducing this reserve and the necessary amount of unpurified metal to complete the succeeding charge into the furnace.

712,450. REFRACTORY STOPPER.—John H. Allendorfer, Westmont, Pa. A refractory stopper provided with a threaded metallic bolt the head and a portion of the body



712,450.

of which are embedded in said stopper, leaving the threaded and projecting therefrom, a stopper-rod having a threaded bolt adapted to receive the threaded end of the bolt aforesaid, whereby said stopper is secured to said stopper-rod.

PERSONAL.

Mr. Charles Boettcher, a heavy mining operator of Leadville, Colo., was in the East last week.

Mr. F. H. Minard, mining engineer of Denver, Colo., recently left for California on professional business.

Mr. Samuel Newhouse, interested in Utah mines, recently returned to New York City from London, England.

Mr. H. W. Turner, of San Francisco, has taken temporary charge of the Cherry Hill Gold Mine at Yreka, Cal.

Mr. E. H. Baker, of the Chicago Stock Exchange, was a recent visitor to the mines of Central City, Colo., and vicinity.

Mr. Kurtz Schmidtz, a prominent steel manufacturer, of Hamburg, Germany, is inspecting steel plants about Pittsburg, Pa.

Mr. S. A. Rank, of Central City, Colo., is spending several weeks in the southern portion of Colorado on mining business.

Mr. W. G. Miller, provincial geologist, has lately been looking over the working mines in Northwestern Ontario, Canada.

Mr. George J. Bancroft has been appointed consulting engineer to the Stratton Development Company at Cripple Creek, Colo.

Mr. E. J. Adams, of Apex, Gilpin County, Colo., has returned from a business visit to Washington, D. C., and other Eastern points.

Mr. H. C. Holthoff, vice-president of the Holthoff Machinery Company, of Cudahy, Wis., was in Denver, Colo., recently on business of his firm.

Mr. Leo Von Rosenberg, of New York City, arrived at San Francisco on November 4 from the West Coast of Mexico and Lower California.

Mr. Willis S. Blatchley, State geologist of Indiana, has recently investigated some sulphur springs near Beck's Mill, Washington County.

Mr. Max Boehmer, the mining engineer, has returned to Denver, Colo., from a trip to Canada, to examine a lead proposition for a German syndicate.

Mr. J. R. Mitchell, of Denver, who looks after the mining interests of Easterners in Mexico, is making a visit to Gilpin County, Colo., to look up properties.

Mr. Warren F. Page, one of the head men of the New Fryer Hill Mines Company, of Leadville, Colo., has returned to Leadville after a visit to New York and Boston.

Mr. C. P. Collins, of Bradford, Pa., has been looking at his mining interests in Gilpin County, Colo. Mr. Collins is also interested in some bonanza mines in Peru, S. A.

Mr. J. J. Reilly, of Central City, Colo., is examining mining property in Summit County, Colo., after which he will go to California to look after mining interests.

Mr. Herbert Kilburn Scott, consulting mining engineer, of Rio Janeiro and London, is at present in South Russia, examining manganese deposits for an English syndicate.

Mr. L. W. Tatum, mining engineer of Chicago, Ill., passed through Denver, Colo., recently, on his way home after spending several months in Arizona on professional business.

Mr. John A. Moore has left Boulder, Colo., where he has been for several years, to take the position of metallurgist to the Rambler Mining and Smelting Company, Laramie, Wyo.

Messrs. Henry O. Winters and J. R. Williams, mining engineers, of Philadelphia, Pa., have gone to Mexico to close an important mining deal on some properties near Guadalajara.

Mr. Frederick H. Morley has just returned to Colorado Springs from the Telluride District, Colo., where he has been making mine examinations under the direction of Mr. J. W. Mercer.

Mr. A. M. Welles, of Denver, Colo., consulting engineer of the Victory Mining Company, has returned from a visit to the company's property in the Black Hornet District, near Boise, Idaho.

Mr. John Hays Hammond has been in Denver, Colo., with his assistant, Mr. A. Chester Beatty, who has just returned from an extended visit of inspection of the Heinze copper properties in Montana.

Mr. Robert A. Renwick, a newspaper man well-known in the Nelson District, has been appointed gold commissioner for the Nelson, Arrow Lake and Goat River Mining Divisions of British Columbia.

Mr. Carl Scholz, of St. Louis, Mo., moved on November 1 to Little Rock, Ark., where he has accepted a position with the Rock Island and Choctaw railroads in general charge of all their mining interests.

Mr. H. P. DePencier, of Vancouver, B. C., has been appointed demonstrator in mining engineering at McGill University, Montreal, Quebec. Mr. DePencier was a student at the Vancouver High School before entering the University.

Mr. Simon Guggenheim, who has been spending some weeks in Colorado, last week went to Butte, Mont., accompanied by Mr. Edgar Newhouse, his Denver representative. He thinks Nevada has a mining boom due in the near future.

Mr. Leonard D. Sivyer, mining engineer of Spokane, Wash., has been examining the Blue Bird Mine in the Hoo Doo Mining District, 30 miles east of Palouse City, Idaho, for Des Moines, Ia., people. Mr. Sivyer is now in Seattle on professional business.

Mr. E. Barton Hack, an Australian mill expert, who has been installing machinery for treatment of slimes by filter press in the Camp Bird Mill at Ouray, was in Denver, Colo., last week en route for California to make a demonstration for a large cyanide plant on the Pacific Coast.

Mr. R. A. C. McNally, for about 2 years representative in British Columbia of the James Cooper Manufacturing Company, Limited, with headquarters at Rossland, is about to be transferred to the company's head office, in Montreal, Quebec. Mr. W. Morton will have charge of the Rossland office after Mr. McNally's removal.

Messrs. L. H. Taylor and W. A. P. Davis, of Philadelphia, Pa., were recent visitors in Gilpin County, Colo., both gentlemen having holdings in the Gregory-Buell Consolidated Gold Mining and Milling Company, operating at Central City. Mr. Taylor had returned from a visit to Copper Flats, Nev., where he is interested in copper deposits.

Mr. Anthony J. McMillan, of Rossland, recently left for London to attend meetings of the Le Roi Mining Company, and the Snowshoe Gold and Copper Mines, Limited, he being a director of both companies. While he is in London it is probable the management of the Snowshoe Company will come to a decision relative to providing smelting facilities.

Mr. E. B. Van Osdel, metallurgist for the Spokane Smelting and Refining Company, which has taken over the smelter at Spokane, Wash., has been visiting the Slocan District of British Columbia, looking into the silver-lead situation. The Spokane Smelter was built 7 or 8 years ago, but has not been operated for several years. It has 2 lead stacks of a combined daily treatment capacity of about 250 tons.

Mr. N. C. Bonnevie, consulting engineer, of Denver, Colo., has taken into partnership Mr. E. A. Lee, late of the American Bridge Company, in Denver. The firm will be known as Bonnevie & Lee, and will, as before, make the designing of mining, milling, smelting and power plants a specialty, with offices at 17 Jacobson Building. Mr. Lee has for the last 5 years been chief designer for the American Bridge Company's Denver office.

Mr. Hamilton Brotherton is suing his former partner, Mr. Charles Kemp Van Ee over the title to 45 per cent interest in the Royal Consolidated Mines of California, Limited, with porperty located in Calaveras County, Cal. A deal with London parties was about consummated by which Mr. Van Ee would have received a large sum, when Mr. Brotherton intervened and filed a *lis pendens*. Mr. Van Ee has received some attention in the columns of the ENGINEERING AND MINING JOURNAL in the past.

Mr. R. E. Newton, associate member American Society of Civil Engineers, is devoting his entire time to the interests of the Newton Engineering Company, of Milwaukee, Wis., recently incorporated, which is equipping a shop for structural steel work. Mr. Newton was at one time in the employ of the Keystone Bridge Works of the Carnegie Steel Company, and of the Wisconsin Bridge and Iron Company, and for several years was structural engineer for the Boston & Montana Copper and Silver Mining Company..

Mr. J. W. Young, secretary of the Allis-Chalmers Company and manager of the New York office, has retired from these two positions and has been appointed general European sales manager of the Allis-Chalmers Company, with headquarters in London, Eng. Mr. Young's 18 years' connection with Fraser & Chalmers, during which period he represented them in Mexico, Australia, China, Japan, Straits Settlements and other foreign countries, and his qualification as general mining machinery expert and salesman eminently fit him for this important position. While his many American friends will regret his going abroad he has without question the best wishes of all those who have had the good fortune to meet him and avail themselves of his ability.

SOCIETIES AND TECHNICAL SCHOOLS.

MICHIGAN COLLEGE OF MINES.—The attendance this year is 191, being the largest since the founding of the school. In 1901 the registration was 164. Almost every State in the Union is represented.

GEOLOGICAL SOCIETY OF AMERICA.—The fifteenth winter meeting of the Society will be held at Washington, D. C., on Tuesday, December 30. The preliminary list of papers will be mailed on December 5. The hotel headquarters will be the Ebbitt House, adjacent to the Geological Survey Building. The American Association for the Advancement of Science will hold a winter meeting in Washington during the week beginning Monday, December 29. The usual reduction in railroad rates will undoubtedly be secured, available to members of all the affiliated societies.

Matter for use at the meeting can be sent to the Geological Survey, in care of Mr. C. W. Hayes.

ENGINEERS' CLUB OF PHILADELPHIA.—At the meeting on November 1 there were 65 members and visitors present.

Mr. William D. Beatty presented the paper of the evening upon "Some Features of the Guayaquil and Quito Railway, Guayaquil, Ecuador, S. A." By the aid of lantern illustrations he described the general character of the country and the engineering details involved in constructing this railroad across the Andes Mountains. The subject was discussed by Messrs. John E. Trautwine, Jr., Carl. Hering and others.

Mr. Arthur Falkenau exhibited and described a recently constructed machine, of small size, for testing wire especially for use in cables. The methods of making such tests were discussed by Messrs. Edgar Marburg, Charles Hewitt, George M. Sinclair and others.

The twenty-fifth anniversary of the founding of the society will be celebrated by a banquet at the Union League in Philadelphia on Saturday, December 6.

AMERICAN CHEMICAL SOCIETY—NEW YORK SECTION.—The second meeting of this winter's session was held on November 7 at the Chemists' Club. Dr. T. J. Parker was in the chair. The first business taken up was the question as to withdrawal from the Scientific Alliance. It was decided that an expenditure of over $700 as assessments for Alliance expenses had resulted in no tangible advantage, and the society voted to withdraw from the Alliance. A letter was read from Dr. Charles R. Squibb announcing the presentation to the section of the chemical balance and weights and flasks used by his father, the late Dr. E .R. Squibb, in preparing his celebrated alcoholic specific gravity tables. The announcement was also made that associate membership had been abolished by the council, and all who had been associates now became full members.

The following papers were read: "The Determination of Sulphur and Phosphorus in Organic Materials," H. C. Sherman; "The Composition of Cows' Milk," H. C. Sherman; "The Ocurrence of Salicylic Acid in Fruits," F. W. Traphagen and Edmund Burke.

INDUSTRIAL NOTES.

At the Dusseldorf Exhibition just closed the highest award of merit, a gold medal, was awarded the Hunt conveyor, manufactured by the C. W. Hunt Company, of West New Brighton, N. Y.

The F. D. Cummer & Son Company, of Cleveland, O., has just sold one of its Cummer semi-portable asphalt paving plants to the Marion County Construction Company, of Indianapolis, Ind.

The Burt Manufacturing Company, of Akron, O., announces a recent order from the Atlas Portland Cement Company for 6 Cross oil filters, making 16 in use by the latter concern in different plants.

The Dibert Manufacturing Company of San Francisco, Cal., has furnished J. B. Hobson, of the Consolidated Cariboo Hydraulic Mining Company, of Bullion, B .C., with a complete set of Finch cups for the machinery.

Owing to increased business the Luther Brothers Company, manufacturer of the Electric diamond grinder and other hardware specialties, has removed its plant from Milwaukee to North Milwaukee, Wis., and now in its larger quarters can give prompt and careful attention to all orders.

The Bay City Iron Works, of San Francisco, Cal., has just completed and shipped to the Northern Commercial Company several large oil tanks for warehouses in Alaska. Large oil tanks have been fitted by this concern for the tug *Sea King*, owned by the Merchants Tug Boat Company, of San Francisco.

The American Steel and Wire Company exported in October 5,647 tons wire and 3,747 tons wire nails, an increase of nearly 80 per cent over September. The principal purchasing countries were Australia, South Africa and South America, while smaller shipments were made to China, Japan, Mexico and elsewhere.

The J. B. Ehrsam & Sons Manufacturing Company, of Enterprise, Kan., has secured a contract for furnishing all the machinery for the 150-ton plaster mill to be erected for the Texas Cement Plaster Company, of Quanah, Tex. The contract includes a full line of calcining kettles, plaster mixers, nail pickers, elevator and power transmitting machinery.

The Deming Company, manufacturing pumps and hydraulic machinery at Salem, O., is erecting a separate building to be devoted to its power pump business. The company recently found that its facilities for this line were not sufficient. The pumps manufactured by the Deeming Company are used for boiler feeding, mine pumping, elevator service, general water supply, etc.

The United States Coal Company is about to equip its soft coal mines at Dillonvale, Jefferson County, O., with electrical machinery, and for that purpose recently purchased from the Westinghouse Electric

and Manufacturing Company two 150-k.w., 550-volt, direct-current generators, and two 10-ton mining locomotives. Electric power will be used for the locomotives and other mining machinery.

F. G. Street, 36 La Salle Street, Chicago, Ill., has been appointed sole agent for Northern Illinois, Indiana, Michigan, Minnesota, Wisconsin, North and South Dakota and Kansas, for the Scaife and We-Fu-Go water softening and purifying systems, manufactured only by William B. Scaife & Sons Company, Pittsburg, Pa. Mr. Street is known throughout that territory in manufacturing and engineering circles, and has given the subject of water purification considerable attention.

During the past few days the Colorado Iron Works at Denver, Colo., has received a large number of orders, among them the following: One reverbatory furnace, crushers, rolls, Bartlett concentrating tables, impact screens, boilers, engines, etc., for the Keystone Copper Smelting Company, of Santa Anna, Mex.; one 100-ton pneumatic cyanide plant for Hall & McConnell, Pluma, S. Dak.; one 46 in. by 120 in. copper furnace and fire hearths for the Tezuitlan Copper Company, of Tezuitlan, Mex.

Pohle & Parmelee, of Denver, Colo., have opened an assay office and chemical laboratory at 1627 Champa Street. They lately resigned positions as chief assayer and chief chemist at the Globe plant of the American Smelting and Refining Company. The equipment of the firm's office and laboratory is new and modern in every respect. In addition to umpire and control work, which will receive careful attention, the new firm intends to make a specialty of the chemical treatment of ores.

The Green Horn Mountain Copper Mining Company, of Salida, Colo., is installing a concentrating plant for its mine, and recently purchased from the J. H. Montgomery Machinery Company, of Denver, Colo., 2 sets of 14 in. by 27 in. high-grade crushing rolls and other necessary machinery. The Green Horn Mountain Company expects to be running the plant before winter sets in. The J. H. Montgomery Machinery Company states that it has orders for several sets of high-speed rolls, and that its shops are crowded with work.

The Kennicott Water Softener Company, 3569 Butler Street, Chicago, Ill., owing to the demand for its apparatus for treating boiler feed waters, finds it advisable to erect a new factory at its works, devoted exclusively to manufacturing water softeners. The main building is 126 ft. by 50 ft., of mill construction, and equipped with all modern facilities for building softeners. Traveling cranes, pneumatic hammers, riveters, drills, etc., make the shop equipment most complete in every way, and will enable the Kennicott Company to fill orders with great promptness.

The Schultz Belting Company, of St. Louis, Mo., announces that it has just completed remodeling and enlarging its factory, and is prepared to supply the best belting, lace leather, etc., that it has ever turned out. The company uses nothing but the heaviest packer steer hides, and prepares the leather by its own special process. It has added new buildings, increasing the capacity 2½ times, and also added a full line of new and modern machinery, including the latest improved stretching machinery for taking all stretch out of belting, and now has a thoroughly equipped tannery and belt factory, second to none in the United States.

The Sherwin-Williams Paint Company, of Cleveland, O., is equipping all its works for electric power distribution. It recently purchased for the Cleveland works 3 alternating-current generators of 150 k.w., 120 k.w. and 75 k.w. capacity, respectively, and about 500 h.p. in induction motors, which will be used to drive all the paint and varnish making machinery. The company has also equipped its Newark, N. J., works with one 75 k.w., engine-type generator and a number of motors, and is about to install a duplicate plant at the same works. At Pullman, Ill., it is putting in a 120-k.w. generator and one of 100 k.w., and about 200 h.p. in induction motors. The electrical apparatus for the several plants is being furnished by the Westinghouse Electric and Manufacturing Company.

The Chicago Pneumatic Tool Company is enjoying a very prosperous year. Within the last week it has sold large orders for pneumatic tools to some of the leading railroad and industrial corporations in this country, including the Union Pacific Railway Company, Omaha, Neb.; Newport News Shipbuilding and Dry Dock Company, Newport News, Va.; United States Navy Yard, Brooklyn, N. Y.; Maryland Steel Company, Sparrows Point, Md.; International and Great Northern Railway, Palestine, Tex.; Standard Oil Company, Buffalo, N. Y.; American Locomotive Company, Brooks Works, Dunkirk, N. Y.; Baldwin Locomotive Works, Philadelphia, Pa.; Chicago, Burlington & Quincy Railway, at the Galesburg, Ill., W. Burlington, Ia., and Aurora, Ill., shops; New York Central & Hudson River Railroad, Depew, N. Y.

N. A. Christensen states that the Christensen Engineering Company, of Milwaukee, Wis., for which he has been superintendent since its organization and is still consulting engineer, will hereafter manufacture his air compressors connected with air brakes exclusively. This will place under his control the manufacture of air compressors for all other uses. The air compressors will be manufactured by the Christensen Engineering Company under Mr. Christensen's designs, specifications and inspection, insuring the same excellency in design, detail and workmanship which the products of the company have always possessed. There are now in use over 7,000 of these compressors, of all sizes and capacities, constructed under his patents and used for various purposes. Mr. Christensen's engineering and sales offices are in the Herman Building, corner of Wisconsin Street and Broadway, Milwaukee, Wis.

The Monterey Foundry and Manufacturing Company, of Monterey, Mex., announces that G. F. Meehan, who has been general manager, has resigned to devote more time to other interests. He will, however, continue to pay attention to the business. The position of general manager will, from this date, be held by F. T. Llewellyn, who, on October 1, resigned as contracting manager for the American Bridge Company, at St. Louis, Mo. Mr. Llewellyn has had 13 years' experience in the iron and steel business, during which time he designed and superintended the erection of many important structures in the United States. J. A. McConnell, who has been filling the position of secretary and treasurer of the Monterey Company, is about to return to the United States, and on November 15 this office will be assumed by Samuel H. Fisk, who is well known to the machinery trade throughout Mexico.

The smoke nuisance is receiving much attention from the city authorities of Providence, R. I., and 3 large industrial concerns have voluntarily offered to install apparatus in their power stations, which would prevent the formation of black smoke. The Rhode Island and Suburban Railway has contracted for a large equipment of Roney mechanical stokers for its new boiler plant. The plant will have an ultimate boiler capacity of 8,300 h.p. The above stokers will be used throughout. Another large concern, the Narraganset Electric Lighting Company is also installing a complete equipment of Roney stokers, comprising 12 stokers of the quadruplex type operating under Babcock & Wilcox boilers of 4,500 h.p. capacity. A third industrial plant employing these stokers is the Browne & Sharpe Manufacturing Company, where Roney stokers under 2 batteries of Babcock & Wilcox boilers have been in use for some time with excellent results.

TRADE CATALOGUES.

The Kilbourne & Jacobs Manufacturing Company, of Columbus, O., publishes a 56-page catalogue of light cars for plantation use and for service about industrial plants. The catalogue is printed in Spanish and English, contains clear and concise descriptions, and gives dimensions and weights in both English and metric systems.

Portable houses for miners, townsite owners, colonizers, farmers and ranchers are described in a 32-page pamphlet published by the American Portable House Company, of Seattle, Wash. These houses are made in various sizes with from 1 to 8 rooms, can be quickly erected or taken down, and are stated to be durable and comfortable under all varieties of climate.

Hydrocarbon burners, blow-pipe furnaces and cupel machines for chemists and assayers, are described in a catalogue issued by F. W. Braun & Co., of Los Angeles, Cal. Oval and square crucible furnaces, bullion melting furnaces, and combination furnaces, are described in the catalogue. These furnaces can be had equipped either with the Sunset or the Carey hydrocarbon burner, the latter being most highly recommended.

The Waterbury Brass Company, of New York City, has published a 52-page pamphlet, giving weights, sizes and dimensions of the brass, copper, bronze and German silver sheets, tubes, wire and rods that it carries in stock, at its New York City warehouse, the stock being upwards of 1,000,000 lbs. A valuable feature of the pamphlet is a series of tables of weights and measures showing differences in wire gauges, decimal equivalents, of fractions of an inch; weights per linear and square foot of wire and sheets, weights per foot of tubing, etc.

The Buffalo Forge Company, of Buffalo, N. Y., issues a little 16-page pamphlet entitled "Mechanical Induced Draft." The pamphlet contains but little descriptive matter, but well selected cuts show the application of Buffalo induced draft fans driven by Buffalo engines. Another little pamphlet issued by the Buffalo Forge Company tells of the Buffalo engine, which is made in the center or side crank horizontal type and tandem compound, horizontal type; also in the vertical center crank, vertical cross compound, marine and marine cross compound types.

Conveying machinery for use about coal storage stations, cement works and many industrial plants, is described in the 38-page pamphlet published by the Steel Cable Engineering Company, of Boston, Mass. The gravity buckets and pans used in the system are made of either sheet-steel or malleable iron, as the work requires, and either a steel cable or a locked-link bushed chain is used. Numerous illustrations show the methods of attaching buckets, the tripping device, the conveyor driver, various methods of feeding material to the conveyor, etc.; other illustrations show the conveyors in use at power plants, foundries, coal docks, etc.

Sederholm boilers for high pressures and large units are described in a 48-page pamphlet, published by the Allis-Chalmers Company, of Chicago, Ill. These boilers consist of a tubular boiler of large dimensions connected to a series of cylindrical drums underneath, the object of this construction being to provide a roof of thin material over the whole furnace and to shield the thick shell of the large boiler from the direct flame. The company states that the furnace is exceptionally high and, therefore, especialy adapted for burning all kinds of soft coal and wood. The direct heating surface is unusually large. From the construction of the boiler there is very little chance for soot and ashes to lodge, and the lodging places are easy of access.

The Deeming Company, of Salem, O., has issued a new edition of its general catalogue as a cloth-bound booklet of 294 pages. This catalogue contains descriptions of many pumps not illustrated in former editions. The Deeming Company makes a specialty of pumps for all varieties of domestic purposes, including lift and force pumps, windmill pumps and deep-well pumps, but also manufactures boiler feed pumps, triplex power pumps and air compressors, centrifugal pumping machinery and pipe-line oil pumps, hydraulic rams, hose fittings, pipe fitter's tools, well drivers' supplies, etc. The descriptions in the pamphlet are brief and concise, and the illustrations are sufficiently clear. The line of pumps and pumping machinery shown is unusually large, and the catalogue is of more than usual excellence.

Catalogue No. 7, published by the C. O. Bartlett & Snow Company, of Cleveland, O., describes that company's elevating, conveying and general mill machinery of all kinds. The company manufactures machinery for cement mills, fertilizer works, paint mills and coal docks, and also manufactures conveyors and elevators for every possible variety of work about mills, factories and industrial plants. The company's Triumph Common Sense conveyor and elevator is recommended for conveying all kinds of material, including hot ore, clinker, molten slag, very coarse gravel, coal, clay, etc. The company also installs conveying machinery for use about gold placer claims where the ground is too level for hydraulic washing, and builds belt conveyors, aerial tramways, water elevators, etc. The catalogue is of interest to any person contemplating the use of conveying machinery.

Wyckoff's wood water pipe, made by the A. Wyckoff & Son Company, of Elmira, N. Y., is made of white pine in 4 to 8 ft. lengths, connected by penon and socket joints, and having wood elbows, tees, bends, and any special connections required with pumps or metal pipes. The company states that it has been manufacturing this pipe for 46 years and has furnished it for conveying mine water in coal, iron, zinc, copper and silver mines, in nearly all the mining districts of this country and Canada, and for conveying acid liquors, and other corrosive fluids about industrial plants. Wyckoff's strengthened wood-pipe is made in length of 6 to 8 ft., banded with steel hoops spirally wound, and will stand a maximum pressure of 400 ft. This style of pipe is most frequently used for mine water, and is described as perfectly air and water-tight, and guaranteed to give satisfaction for either suction or column pipes. For export the company recommends its wood stave pipe, made of thoroughly dry white pine staves, which will stand transportation and change of climate without damage.

GENERAL MINING NEWS.

Chesapeake & Ohio Railway Company.—Coal and coke shipments in September and the three months of the company's fiscal year, beginning July, were as follows, in short tons:

	1902. September.	1902. —Three	1901. Months.—
Coal:			
New River	72,591	137,889	1,024,472
Kanawha	23,433	57,214	297,743
Kentucky	5,917	19,723	25,954
	101,941	214,826	1,348,169
From connections	11,656	23,795	22,867
Total, coal	113,597	238,621	1,371,036
Coke:			
New River	13,906	30,302	87,911
Kanawha	80	653	19,642
	13,986	31,955	107,553
From connections	193	1,667	3,207
Total, coke	14,179	33,622	110,760
Grand total	127,776	272,243	1,481,796

Coal shipments in the three months this year show a falling off of 1,132,415 tons, or 83.3 per cent, principally from New River District to tidewater points.

Coke shipments record a decrease of 77,138 tons, or nearly 70 per cent, owing chiefly to a smaller Western movement.

ARIZONA.

COCHISE COUNTY.

(From Our Special Correspondent.)

Old Terrible Mining Company.—The ores of this company's mines at Manzona are said to average $20 gold to the ton, and the mill is said to turn out 8 tons of $160 concentrates daily.

GRAHAM COUNTY.

(From Our Special Correspondent.)

Shannon Copper Company.—Ground has been broken for the 500-ton concentrator at Clifton.

MARICOPA COUNTY.

(From Our Special Correspondent.)

Senate Gold Company.—This company, in Congress District, has found rich ore in a 460-ft. shaft on one of its claims. The group comprises 13 claims.

MOHAVE COUNTY.

(From Our Special Correspondent.)

Enterprise.—The company owning this mine in Wallapai Mountain, has opened a large body of silver-lead ore.

Gold Nugget.—This mine, at Cerbat, belonging to John Barry, is improving.

Vulcan Smelter.—This plant at Chloride has been running since October 15.

PINAL COUNTY.

(From Our Special Correspondent.)

Santa Rita Mining Company.—This company was recently formed by San Francisco men to work placer mines in the foothills of the Santa Rita Mountains, near Tucson.

YAVAPAI COUNTY.

(From Our Special Correspondent.)

Hurricane Group.—A strike of rich gold ore is reported in this mine, near Prescott.

Iron King.—Mr. Giroux, superintendent of this mine, near Jerome, is having a tramway built to the smelter, a distance of 1 mile.

YUMA COUNTY.

(From Our Special Correspondent.)

Arizona Reduction Company.—This company has taken first steps toward erecting a 100-ton smelter at Yuma.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

Zeila Mining Company.—At this mine, at Jackson, W. F. Detert superintendent, the new tanks for holding oil fuel are being filled. Shaft repairing has begun, and the mill will be shut down for 2 or 3 months.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Angels Mining Company.—At this mine at Angels, James V. Coleman, of San Francisco, owner, a 30,000-gal. tank for oil fuel is being put up.

Robles.—Mill tests on ore from this mine near Murphys have resulted satisfactorily.

San Anorcas.—This mine and the Dorothy adjoining, at San Anoreas, will shortly be sold by E. M. O'Boyle, of Salt Lake, Utah, to Montana men, who will develop it as soon as papers are signed.

Walsh.—This mine, near Copperopolis, formerly known as the Lightner, has started up with a small force.

DEL NORTE COUNTY.

(From Our Special Correspondent.)

Beach Sand Mine.—The mine below Crescent City, where ocean beach sands are worked, has made a preliminary run with its new machinery.

INYO COUNTY.

(From Our Special Correspondent.)

Dunphy.—Work has been resumed on this mine at Keeler by Troeger Brothers, who recently brought in new machinery.

KERN COUNTY.

(From Our Special Correspondent.)

Baltic Mining Company.—At this mine, at Randsburg, C. H. Wynne superintendent, the new 10-stamp mill is running.

Butte.—The Stanford Company working on this mine's tailings has made a satisfactory clean-up.

Mattie.—This claim in the Stringer District has been leased and bonded by Wilkinson Brothers to Los Angeles men.

Vedder.—The claims of G. D. Vedder at Garlock are to be developed.

LOS ANGELES COUNTY.

(From Our Special Correspondent.)

San Pedro Smelter.—For years there has been talk of a smelter near Los Angeles. Now Mr. Eichelberger, of the San Pedro Ice and Cold Storage Company, announces that he, with others, will build at or near San Pedro, the port of Los Angeles, a smelter to treat, at first, 50 tons of ore daily.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Turner.—This mine, near Mount Bullion, is reported bonded to Messrs. Elder & Sharp, of Visalia, who will begin development.

MONTEREY COUNTY.

(From Our Special Correspondent.)

Mother Lode Mining Company.—At this mine, in Los Burros District, near Mansfield, the recently built mill plant of 2 stamps, a concentrator and 10-h.p. engine, has about 220 tons from the Grizzly Mine ready for milling.

NEVADA COUNTY.

(From Our Special Correspondent.)

Blue Tent Mining Company.—This company, of Nevada City, C. J. Graham superintendent, has bought 250 tons of sheet iron, cut for water pipe, from the Sweepstakes Mine. The iron will be taken from Redding, where it was delivered for the Sweepstakes Company, to Nevada City, where it will be made up into pipe. The Sweepstakes is the company which spent so much money on a mine, found later to be of much less value than expected.

California Mining Company.—This property, formerly known as the Gaston Ridge Mine, L. R. Poundstone superintendent, is one of the paying mines of the county, and employs 60 men. While the ore is low grade, the 30-stamp mill is able to crush 150 tons per day. Water power is used. The main tunnel is 2,800 ft. long.

Gold Blossom.—This mine at Grass Valley, owned by Richard Jeffrey, but bonded to George F. Dyer and E. L. Campbell, of San Francisco, is to be worked on a larger scale when the ledge is cut in the tunnel, and a 10-stamp mill is ready.

Pennsylvania Mining Company.—In the settlement of the litigation between this company and the Grass Valley Exploration Company, at Grass Valley, the Pennsylvania comes into possession of all the property of the Grass Valley Exploration Company, including the famous W. Y. O. D. Mine, with its hoist, 20-stamp mill, concentrators, etc.; the Kate Hayes Mine, the Nuttall, Sims, Grant, New York, Oliver and Crescent claims. Water has been allowed to rise to the 900 level of the W. Y. O. D. This will be removed at once, and as soon as the bottom of the 1,000-ft. shaft is dry work will begin. The superintendent of the Pennsylvania Company is Bennett Opie.

PLACER COUNTY.

(From Our Special Correspondent.)

Crandall.—This mine, below Auburn, R. F. Hartley superintendent, is being reopened by Eastern men and new machinery is being put in.

SACRAMENTO COUNTY.

(From Our Special Correspondent.)

Folsom District.—Four dredges are working near Folsom and 3 more are to be built. The Gray Wing, Prosperity, Blue Ravine, Hupp & Roberts, and some other drift mines within a few miles of Folsom are doing well, and some are paying dividends.

Gray Wing Mining Company.—The court has overruled the demurrer of P. A. Cameron to the answer filed by the defendants in his suit to recover an interest in this property. The case has attracted considerable local attention. A number of persons, including Cameron, jointly leased the Gray Wing Mine, agreeing to pay so much each to develop it. Cameron failed to pay his assessment, and what would have been his share was sold to others. After considerable dead work the mine began to pay handsome, and Cameron sued for his share and for an accounting on the plea that the mine being real property his share could not be taken from him without due process of law, and that the fact that he did not pay for his share had nothing to do with it.

Hupp.—The drill which has been in use at the Sweepstakes Mine has been removed to this drift mine near Folsom for prospecting.

SAN BENITO COUNTY.

(From Our Special Correspondent.)

Cerro Bonito.—The directors of the company organized to take these quicksilver mines, now owned by Thomas Flint, Jr., of Holister, are H. R. Bradford, of San Jose, and James Treadwell, B. M. Bradford and W. C. Kennedy, of San Francisco. The property has not been worked for many years, but is considered very promising.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

Brick Consolidated Mining Company.—The Federal Gold Mining Company is arranging to take over these mines near Manvel.

Copper World.—This copper company, operating at Rosalie, near Manvel, is in debt to a Los Angeles bank. George H. Sisson is president and E. M. Clark superintendent. There is some copper bullion on hand. A sheriff's sale is set for December 15.

Chrysoprase.—A deposit of this mineral has been discovered on the desert near Sugar Loaf. The only other deposits of chrysoprase found in California are in Tulare County, where considerable gem material has been taken out.

Federal Gold Mining Company.—This company is cleaning out the workings of the St. George and Boomerang Mines at Vanderbilt, near Manvel. It is intended to sink a double compartment shaft on the St. George and erect a concentrating plant at the Needles. L. C. Gilliam is superintendent.

Roosevelt.—Pasadena men are doing considerable work on this mine at Ludlow, and have put in a new hoist.

SHASTA COUNTY.

(From Our Special Correspondent.)

Balaklala.—The Salt Lake and Pennsylvania men holding the bond on this mine announce a resumption of work with 30 men.

Bully Hill Mines.—This company will shortly have electric power and light, a contract having been made with the Northern California Power Company. The line will be 19 miles long. As soon as the consolidation of interests with the Mount Shasta Gold Mines is completed the miners' wages at Bully Hill are to be raised from $2.75 to $3 per day.

Great Western Gold Mining Company.—This company has brought suit at Redding against Mrs. J. A. Wilson for possession of the Sugar Pine Gulch group in Afterthought District, and for value of ore now being extracted by her. The claims were sold under execution, and were worked pending time for redemption. A receiver has been appointed.

Mountain Copper Company.—The fire in the Lost Confidence level at this mine, near Fielding, is still burning. Few miners have been laid off.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

Hickey.—In this mine on Whites Gulch the tunnel has shown up a 2-ft. ledge of good ore.

Highland.—In this mine on Trail Creek in East Fork District the 400-ft. tunnel is finished. A 4-ft. ledge was cut, which milled about $17 per ton.

Sheldon.—The copper mine of D. M. Sheldon, near Sisson, is being developed.

SONOMA COUNTY.

(From Our Special Correspondent.)

Healdsburg Mining Company.—This quicksilver property, near Healdsburg, is being developed. Steam pumps and hoisting works have been put in.

Socrates.—Recently George M. Pinney, Jr., of New York, petitioned the Superior Court for the appointment of a trustee for this quicksilver mine in place of W. B. Carr, deceased, and F. A. Huntington, was appointed, who withdrew in favor of W. H. Humphrey. The latter has now sued Huntington, W. H. Troop and T. W. Nowlin for a three-quarter interest in the mine, and also asks $5,000 damages for the refusal of the owners to yield up the property.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

Black Oak.—At this mine, near Soulsbyville, tanks for an oil burning plant are being put up.

Bourbon.—The owners have begun work on this mine at Jupiter.

Dead Horse.—It is now thought that the extension of this famous ledge at Carters has been found in 2 places, and sinking at both places will start at once.

Mayflower Tunnel.—Air drills are now used in this tunnel.

Soulsby.—At this mine at Soulsbyville since the new air compressor has been put in drifting has been resumed.

Spring Gulch.—K. C. Parrish has bonded from Robert Marshall the Spring Gulch Mine and mill-site at Carters; the Somerset, the north extension of the Spring Gulch and the New Era or Hunter. In the latter mine some good strikes have lately been made. At the Spring Gulch a new building is being put up over the hoist. The masonry work for the mill is completed.

Stockton Gravel Mining Company.—At this mine, near Jupiter, Wash. Tucker superintendent; the company intends to open the gravel in a new place this winter. The bank is about 45 ft. high.

TRINITY COUNTY.

(From Our Special Correspondent.)

Bully Choop.—At this mine, near the border of Shasta County, the new 10-stamp mill has started work. A new tramway is also in operation.

VENTURA COUNTY.

(From Our Special Correspondent.)

Mount Alamo Mining Company.—A considerable quantity of mica has been prepared for market and contracts made for the sale of some of it.

COLORADO.

(From Our Special Correspondent.)

The reaction from the tension preceding election shows a healthful condition of the mining industry in Colorado, and the quest for legitimate mining investment is as keen as ever. Several important deals are under consideration.

Boulder County is attracting special attention from mining men just now by reason of the big shoot opened in the Livingston Mine in Sugar Loaf District from which about $20,000 has been taken in 3 weeks by working 10 men.

The Logan, in the same vicinity, on the Four Mile side of Sugar Loaf, has encountered 6 in. of very rich ore in Croesus Tunnel at 1,500 ft. from the portal, and at a vertical depth of more than 625 ft. The same seam has been opened in the 3 upper levels. One shot, it is said, broke down $500 worth of ore. The Logan has produced about $500,000 in the past 5 years.

BOULDER COUNTY.

(From Our Special Correspondent.)

New Century Mining Company.—This company, operating the Longfellow group at Jamestown, has erected a 200-h.p. plant on James Creek, and will transmit the electric power 2 miles to the mine and mill, where a 100 h.p. air compressor and a 50-ton concentrating mill, furnished with Bartlett tables, are steadily at work, the latter producing a smelting product, running about $55 per ton, which is hauled to the railroad at Boulder, distant about 16 miles. A few car-loads of smelting ore, running $89 per ton, have been shipped, besides the concentrates. The deepest workings are about 350 ft., and during the past year about 2,000 ft. of level work has been done. Theodore Craig is superintendent and about 25 men are employed.

GILPIN COUNTY.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—Danville Gold Mining and Milling Company to the Ingalls Gold Mining Company, the Skelley lode, Illinois-Central District; E. J. Adams to the Mammoth Mining, Milling and Development Company, the Alaska group of 7 lodes, Wisconsin District; W. H. Paul to Henry Paul, the Champion, Elite and Bi-Metallic lodes, Pleasant Valley District; A. H. Wood to W. Hoefle, 2-3 interest in Golden lode, Russell District; A. S. Sternberger to H. O. Raedel, the Little Maggie lode, Vermilion District.

Gilpin Shipments.—The shipments from the Black Hawk depot to the Denver and Golden smelters and outside points of smelting and crude ores, mill tailings and concentrates for October were 405 cars, or 8,100 tons. The shipments for October, 1901, were 350 cars, or 6,469 tons, showing an increase of 55 cars, or 1,631 tons, a gain of 25 per cent.

Belden.—A new shaft building, 34 by 64 ft., is to be erected on the main shaft of this property in Chase Gulch, and a large plant of machinery will be installed. Eastern men are interested under a lease and bond, and the main shaft is being retimbered. W. Couch, Central City, is in charge.

Boston-Occidental Mining Company.—Ground has been broken for a new reduction works to be erected at American City in the Pine Creek District. The company has been experimenting with a small plant in Denver, and this one will have a much larger capacity. The company intends to resume operations on the Mascot group, and will carry on active development this winter. C. S. Ripley, Apex, is manager.

Four-Mile Gulch Tunnel Mining Company.—A new shaft building, 20 by 36 ft., has been erected on the Bryan lode in Enterprise District, and a small gasoline plant installed. The company is running the Bryan and Wheeler tunnels from 2 gulches to connect, and is opening a fair vein of silver lead ores. J. Brohl, Central City, is in charge.

Gower Mines Syndicate, Limited.—October production was 200 tons of concentrating ores and 90 tons of smelting ores, the latter running from $75 up to $200, and some going higher. The concentrating ores carry good gold values as well as lead, and are mostly handled at Idaho Springs concentrators. Sinking continues, and the shaft is close to 800 ft. deep.

Gregory-Buell Consolidated Mining and Milling Company.—Developments are carried on systematically, and as soon as connections can be made from the Buell to the Gregory shaft regular production will follow. Fine ore bodies have been opened in the Gregory.

Hall.—A new shaft building is being erected, and machinery has been installed by the owner, Isaac Hall, of Russell Gulch. While only a prospect of 100 ft. depth the claim has shown itself one of the richest propositions in the Russell District, and heavier developments will follow this winter.

Hidee Gold Mining Company.—In cross-cutting north at a depth of 200 ft. the Fahey vein has been encountered. It shows yellow and gray copper and peacock iron, and carries good values. The ores are separated into 2 classes for the Denver and Golden smelters. A lift of 100 ft. is being sunk, which will make the shaft 300 ft. deep. Missourians are interested with John Dickey, Central City, as manager.

Perigo Extension.—Some good ore has been opened in this property in the Independent District, in a shaft only 35 ft. deep, the vein being opened up for a width of 14 ft., of which 2 ft. is iron, carrying very fair values. The property is believed to be the same as the famous Perigo which has been such a fine producer for many years. W. H. Kelly, Perigo, is the owner and operator.

Stewart.—Kramer & Co., a local pool having a lease on this property in Russell District have opened some free gold ore in sinking on the west end of the claim. They have shipped some of the lead ore, giving values of 6 oz. gold, 31½ oz. silver, and 55 per cent lead per ton. The property is owned by H. M. and Willard Teller, of Denver.

Tungsten Mining and Milling Company.—This company is opening up some wolframite on its Walter A. Claim in the Jenny Creek District, in a 90-ft. shaft. It has sent some ores to the Primos Chemical Company, of Primos, Pa., the ores containing 69.98 per cent tungstic acid. The company intends to carry on sinking this winter, and will install machinery. B. F. Pyle, Eldora, is manager.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Leadville Ore Output.—Smelting conditions are so changing that November promises to be a banner month. Additional shipments by lessees of low-grade oxidized iron ore, an increase from the Monarch mines and an increase from the Fryer Hill Mines Company territory, will be the principal additions during November. The production in October amounted to 75,000 tons, a portion of which was zinc concentrates and dump material from the Moyer Mine. The smelters handled about 2,000 tons of ore daily.

Leadville Zinc Situation.—The market is improving, and shipments average over 6,000 tons a month. The latest buyer is the Cherokee-Lanyon Spelter Company, of Gas, Kan., which is buying 30 tons a day of zinc-iron sulphides.

American Smelting and Refining Company.—A new schedule, effective November 10, is announced that is of the utmost importance to the Leadville District. The smelter will take every pound of oxidized iron ore that can be produced, temporarily at least, waiving all treatment charge on such iron ore carrying up to 5 oz. silver and 40 per cent excess, with the understanding that when ore received on this basis nets $3 to the mine any excess over $3 and up to $3.50 is to be taken by the smelting company. The regular schedule on all oxidized iron up to 5 oz. has been 50c. a ton, and this restricted production. The higher grades of iron are not affected by the new schedule, but such low-grade propositions as the Morning and Evening Star and other Carbonate and Fryer Hill leases are affected. The Smelting Company is pushing improvements at the Arkansas Valley plant, costing $200,000, principally new roasters for handling lower grade ores of the district, and by January 1 will have an increased capacity of 20 per cent. The directors of the company visited Leadville this week and announced that they would do all in their power to handle the low-grade ores of this locality. In the party were Messrs. Daniel and Simon Guggenheim, E. W. Nash, Harry Payne Whitney, S. W. Eccles and F. Guiterman, the new manager of the Western plants.

Banker Mining and Milling Company.—B. C. W. Evans & Co., brokers, New York City, are sending out circulars offering stock of this Leadville proposition, which has for years been financed by New York and New Jersey men. The Banker Company is capitalized for $2,000,000, and the brokers offer the stock at 60c. a share, claiming there is $5,000,000 worth of ore in sight. The Banker people have done a large amount of development, have opened some low-grade ore bodies, and the proposition is considered a good prospect, but the statements in the circulars issued by the New York brokers are based more upon the showing made by other Breece Hill properties than by anything in the Banker.

Boulder Mining Company.—At this new shaft on the White Cloud combination on the gold belt, at 170-ft. drifting has begun, and a fissure has just been cut, showing an assay of ½ oz. gold.

Corona.—On this fraction of ground adjoining the A. Y. & Minnie lessees at a depth of 325 ft. have cut 20 ft. of medium-grade iron carbonate. Drifts will be run. The management believes it has the extension of one of the Minnie shoots.

Greenback Mining Company.—The mine still remains closed. There are thousands of tons of good iron sulphides blocked out in the Greenback workings.

Keystone Mining Company.—This concern, financed by Pittsburg, Pa., people, has a long-time lease on the old Rex group in Iowa Gulch, and is now lowering the water at the rate of 350 gal. a minute.

New Fryer Hill Mines Company.—Now that the main working levels have been drained the pumps only have to handle 600 gal. per minute. Opening the old drifts progresses rapidly, and shipments will be increased heavily this month by taking advantage of the new smelter rates on iron ore.

New Leadville Home Mining Company.—A special meeting is being held to vote upon a proposition authorizing the directors to negotiate a loan for defraying the indebtedness and to provide a fund for continuing the operations. The company is still making regular shipments from its Penrose shaft.

SAN JUAN COUNTY.

(From Our Special Correspondent.)

Aztec Gold and Copper Mining Company.—The long tunnel is nearing the vein.

Boston & Silverton Mining and Reduction Company.—The vein has been cut in the Lamont tunnel at 675 ft., and is 25 ft. between walls, principally milling ore, with a 4-ft. vein of smelting values. The tunnel is to cut the Uncle Sam vein, 1,400 ft. further on.

Freeport & Cripple Creek Gold Mining Company.—Contracts of 100 ft. have just been completed on the Ransome and Acme claims, respectively, and new contracts of 200 and 100 ft. have been let. The Ransome is now in 200 ft., and the Acme 325 ft.

Gold King Consolidated.—It is reported that the sale of these properties is consummated.

Idaho.—Development continues. Two satisfactory shipments were lately made to the Durango Smelters.

International Reduction Company.—This company has been reorganized, and will develop its properties on Bear Creek, near Silverton, this winter. The erection of the new mill is deferred until spring.

Monte Vista.—Judge Charles A. Johnson, of Silverton, recently purchased a one-third interest in the gold claim in Maggie Gulch for $3,000. The lode is opened by a 68-ft. tunnel.

New York-Brooklyn.—Samuel Newhouse, of Salt Lake City, Utah, has purchased this property at Chattanooga from Mainon Brothers & Murphy for $185,000. The mine is a steady shipper, and a 10-stamp mill is now going up.

Silver Lake.—At this mill in October over 13,000 tons of ore were treated.

Silver Queen.—A 300-ft. tunnel is being driven to tap the vein 100 ft. below the upper workings, near Silverton. A mill is also considered.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

Cripple Creek Gold Output.—According to figures sent out October shows the largest production for a long time. Over 56,200 tons of ore were shipped, yielding a value of over $2,000,000.

Atlanta.—Judge Goddard and others have taken a lease on this property on Bull Hill, adjoining the Hull City. Several years ago it produced very rich ore, but the ore body pinched out with depth.

C. O. D.—It is reported that the C. O. D. shaft in Poverty Gulch is to be sunk another 200 ft. as soon as possible. The property is under lease to T. B. Burbridge and John Pool, who are sub-leasing the upper levels in small blocks.

Cripple Creek Enterprise Gold Mining Company.—This company, operating under the streets and alleys of Cripple Creek has its new plant of machinery adjusted and has started 2 shifts of men at work.

Dearborn.—This Stratton property has shut down. It is understood that all of the ore in sight has been mined.

Mary McKinney.—This property shipped over 2,000 tons of ore during October. Most of the work is on the 4th and 5th levels, though some is being done above. When the company is able to resume work below the water level the output will be greatly increased.

New Cyanide Mill.—Mr. Rice, of the Stratton properties, has been experimenting with cyanide on Iron Clad Hill ores for some months, and results are reported satisfactory. He may build a cyanide mill on Gold Hill for treating low-grade ores on Iron Clad.

Par Value.—The Par Value Leasing Company, on the Cariolanus, has ordered a cage and is preparing to work on a more extensive scale. It maintains a steady output of milling ore.

Pharmacist.—Taylor & Johnson, lessees, are reported to have a big thing in the old workings.

Portland.—This property is maintaining a heavy output of about 250 tons per day. The bulk of the ore is shipped direct to the mill at Colorado City.

Pointer.—This property is again worked by lessees. It was abandoned several months ago by lessees, and it was supposed to be worked out.

Strattons Independence.—This property is still keeping up a heavy output, most of which is from the upper levels. It is shipping from 250 to 300 tons daily, though the ore is not high grade.

Work.—The lessees upon this property on Raven Hill still continue regular shipments of good ore.

ILLINOIS.

SANGAMOND COUNTY.

(From Our Special Correspondent.)

Coal Mine Consolidation.—The scheme of Newton Jackson, of Philadelphia, Pa., seems to have fallen through, as others previously. Mr. Jackson agreed to take over the properties on November 1, but he has failed to come forward with the wherewithal, and now the various operators say the deal is off.

INDIANA.

MADISON COUNTY.

(From Our Special Correspondent.)

Manufacturers Mining and Fuel Company.—J. J. Netterville, of Anderson; W. G. Kelley, of Alexandria, and E. B. Tyler, of Muncie, have prepared plans for the organization of this company. The company will have its main office in Anderson, with branch offices at Muncie, Elwood and Alexandria. The company proposes to expend $30,000 in sinking shafts on its coal lands, comprising 27,000 acres. The company is capitalized at $250,000.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

Atlantic.—The output for October was 310¾ tons of mineral.

Baltic.—The October production was 530 tons of mineral, compared with 500 tons for September.

Champion.—This mine is stamping 675 tons of rock daily. B shaft is down 760 ft., C shaft 705 ft., D shaft 795 ft., E shaft 1,000 ft.

Franklin.—The October output was 400 tons of mineral.

Osceola Consolidated.—This company has discharged 100 men at the Tamarack Junior, and shut down No. 1 shaft. Several drills have been taken out. The surface force at the Osceola has been divided into 2 shifts, each working alternate weeks.

Quincy.—This mine produced 1,136 1-5 tons of mineral in October. Sixty-two separator jigs have been ordered from the Hodge Iron Company, of Houghton, Mich., for the stamp mill at Mason. Numerous improvements have been completed underground, permitting the handling of a much larger tonnage of rock. W. R. Todd, secretary and treasurer, has completed his examination of the mine and has returned East.

Wolverine.—The 19th level south from No. 3 shaft is opening high-grade ground, and shipping to the mill. The mine produced 512 tons of mineral in October.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Central.—This company has encountered a 16-ft. amygdaloid lode at a depth of 300 ft., with the diamond drill, about 2 miles south of the old mine workings. It is strongly charged with copper.

Phoenix.—The new stamp mill on Eagle River, 1 mile from the mine, will go into commission about January 1. It will be equipped with one head, 24 separator jigs, 4 Wilfley tables and 8 Overstrom diagonal concentrating tables; 16,000 tons of good rock are stored underground for the mill.

MINNESOTA.

(From Our Special Correspondent.)

In sections 14 and 15, T. 59, R. 14, a lot of land has been taken for exploration. This part of the Mesabi has never been more than cursorily explored.

Ore shipments continue quite heavy, though some of the mines, notably the Minnesota hard ore property at Soudan, have about completed their season. The Fayal has shipped more than 1,500,000 tons, and is moving 10,000 tons a day.. The Pittsburg Steamship Company is to lay up its steel barges and run only steamships after about November 10. The company has lost a barge or two this year.

A large number of drills are going into the Vermillion Range, and there will be more activity there the coming winter than in any season for the past 10 or 15 years. Many of these drills are going to points east of Ely.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

Buffalo & Susquehanna Iron Company.—This company has taken an option on land lying near the Hawkins Mine, in section 31, T. 57, R. 22, about 11,000,000 tons of ore. It will be explored thoroughly.

Centipede.—A. M. Miller, of Duluth, has bought a half interest in this property in the north half of the south half of section 4, T. 58, R. 15. This land is being explored as fast as can be.

Chemung Iron Company.—The properties of this company and of the Monroe Iron Company in section 28, T. 58, R. 20, have been consolidated under the ownership of the Monroe Company. There are not less than 15,000,000 tons and probably more shown up, and there is still considerable exploration to be done.

Clairton.—This property belonging to the Clairton Steel Company in fee, and for which $525,000 has been paid, is to be opened as a mine at once, the Minnesota Iron Company having charge of the operation under an operating contract with the Clairton Steel Company. The Minnesota Iron Company has an option on certain percentages of the Clariton ore, under certain conditions and agreements with W. P. Snyder.

Clairton Steel Company.—This company, which furnishes the ore for the furnaces of the Crucible Steel Company of America, has bought of Messrs. Little and Prindle, of Minneapolis, their interest in the southwest quarter of the southwest quarter of section 24, T. 57, R. 22, paying therefor about $100,000. The land belongs to Day Brothers, of Minneapolis, and is under a 20c. royalty to them.

Della Mining Company.—This company has started a drill in section 21, T. 59, R. 14, on lands belonging to Wentworth et al.

Holman.—G. G. Hartley, of Duluth, acting possibly for the Great Northern Road, has bought a half interest in this tract of land, which was recently abandoned by the Donora Mining Company.

Mesaba Chief.—The Great Northern road, which has an option on this State lease for $65,000, has asked more time in which to carry on explorations. It is understood that the road has sunk a drill hole through the taconite, and has found some good ore below. The mine has been explored and condemned half a dozen times in the past 10 years.

Minnesota Iron Company.—This company is doing a large amount of work at Hibbing, where it has established headquarters for all its Western Mesabi operations. It has built a large office, a large laboratory, many cottages, mostly at mining locations, a few miles out of town, and is now about to erect a large and finely equipped machine shop, with traveling cranes capable of handling one of its largest steam shovels. Other improvements are to be made later.

There is a monthly payroll in and closely surrounding Hibbing in iron mining and explorations, amounting to about $200,000. At Eveleth the similar expenditures are in the neighborhood of $150,000. These are the two most active centers for mining and exploration on the Mesabi Range.

Sharon Ore Company.—This property has made a better record this year than was expected, and will probably ship over 200,000 tons. The mine has been well stripped during the year, and in mining and stripping 325 men are employed. The stripping is being done by the Drake & Stratton Company under contract.

Webb.—W. P. Snyder, of Pittsburg, Pa., has bought for the Shenango Furnace Company what has been known as the Webb exploration of 120 acres in the northeast quarter of section 6, T. 57, R. 20, paying for the 25c. royalty $280,000. There is a minimum of 100,000 tons annually, which gives $25,000 a year to the feeholders, M. H. Alworth, M. D. Hull and the Boeing heirs. The mine has been explored to show about 9,000,000 tons of ore, some good and some not so high, and is not yet thoroughly explored. It will be opened as a mine by the Shenango Furnace Company the coming year. The mine will ship its ore over the Great Northern Road under a contract made some time ago.

MONTANA.

FLATHEAD COUNTY.

(From Our Special Correspondent.)

A new strike at Iron Meadow, about 6 miles from Cabinet, has caused a stampede. Rich free gold ore has been found in a ledge about 14 in. wide.

American Kootenai Company.—A rich strike was recently made in a 75-ft. tunnel on the Gold Bug ledge near Cabinet. Development will be carried on all winter with electric drills. About 15 men are employed.

Bachelor.—A 250-ft. tunnel has just been completed at Cabinet, showing a fine body of free milling ore.

Beefsteak.—A large body of good-looking ore has been cut in this claim near Cabinet.

Brick & Brannegan.—At this mine, near Cabinet, 50 men are employed. The 10-stamp mill has run continuously for 2 years. Forty thousand dollars have been taken from the plates this season. Snowsheds have been built to continue work during the winter.

Eldorado Placer.—A crew of 5 men is doing preliminary work for an early run next spring. This placer, near Cabinet, made a rich clean-up this season.

Whitesides Placer.—A small crew of men is finishing the season's clean-up near Cabinet.

Mother Lode.—A contract has been let to continue the tunnel on the Waterloo claim 50 ft.

Way Up.—Work has stopped for the winter on account of lack of accommodations for the men.

MISSOULA COUNTY.

(From Our Special Correspondent.)

Cedar Creek District.—There has been great activity in quartz prospecting in the hills on both sides of Cedar Creek this fall. Cedar Creek was a noted placer camp years ago, but no systematic prospecting for the quartz leads took place until recently. Some fair finds of gold-bearing rock have been discovered.

Montana Coal and Coke Company.—H. C. Merry, general manager of this company, reports that the new tipple and washer and the new trolley line connecting the mines with the coke ovens have been in successful operation for 2 weeks. The shipment of coke is somewhat curtailed by the partial close of the Heinze Smelter in Butte, caused by a cave—in the Rarus Mine, which cut off part of the ore supply for the works.

SILVER BOW COUNTY.

(From Our Special Correspondent.)

Diamond.—At this mine recently the double-deck cage and attached skip fell from the collar of the shaft to the bottom, a distance of 2,200 ft., wrecking the sinking pump. Fortunately, no miners were working in the pump, and no lives were lost.

Montana Ore Purchasing Company.—A bad cave-in in the Rarus Mine has cut down the ore supply for the smelter so as to cause a partial closing of the works. Fortunately, no lives were lost, although a number of miners had narrow escapes.

Original.—The new steel gallows has reached Butte from the American Bridge Company. The work of erection will start at once. This gallows frame will weigh 95 tons, and will stand 115 ft. to the sheaves, being higher than any other at Butte. This is to allow for an ore bin capacity at the shaft of 2,000 tons.

West Stewart.—The new steel gallows frame weighing 80 tons is in place. The foundation for the Nordberg hoisting engine is on the way from the Milwaukee works. Extensive improvements are under way on all of the Clark properties. A timber yard adjacent to a new building to be used for framing all the timbers used at the mines is located on the surface of the West Stewart. It will do away with the old method of having the timbers made on the flat at the Butte Reduction works, and then hauled to the different mines.

PENNSYLVANIA.

Pennsylvania Railroad Company.—Shipments of coal and coke on the lines east of Pittsburg and Erie for the week and year ending November 1, were as follows, in short tons:

	Week	Year 1902	Year 1901
Anthracite	42,451	1,690,478	3,894,615
Bituminous	582,372	22,019,680	16,541,513
Total coal	624,823	23,710,158	20,436,128
Coke	186,661	8,183,187	6,822,280
Total	811,484	31,893,345	27,258,408

BITUMINOUS COAL.

Beech Creek District.—October shipments were 716,513 short tons bituminous coal, and 17,950 tons coke. In the 10 months this year the shipments were 5,522,860 tons bituminous coal, and 171,833 tons coke; total, 5,694,693 tons.

Orient Coal and Coke Company.—With a capital stock of $2,000,000, this company has just been formed to develop a large coal tract in the Klondike District in Washington County. A number of coke ovens will be built. Messrs. Rogers, Brown & Co., and Julian Kennedy control the company. The president is C. W. Jackson, and the treasurer, Reid Kennedy, of Pittsburg.

SOUTH DAKOTA.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Black Hills Mining Men's Association.—The directors have organized by the election of the following officers: Harris Franklin, Deadwood, president; Geo. M. Nix, Lead, first vice-president; S. W. Russell, Deadwood, second vice-president; J. E. Pilcher, Custer, third vice-president; W. S. Elder, Deadwood, secretary and treasurer. These, with R. H. Driscoll, Lead; John Gray, Terraville; John Blatchford, Terry, and C. H. Fulton, Rapid City, constitute the directorate. The association is at work on plans for the reception and entertainment of the American Mining Congress in 1903.

Cleopatra Gold Mining Company.—Quartzite has been reached in the shaft on Squaw Creek at a depth of 250 ft., and drifting has started. The company owns a 50-ton cyanide mill on the ground, and has driven 4,000 ft. of tunnels and cross-cuts on the upper ore horizon, in which 14 verticals were opened, from which ore was taken to supply the plant. The mill has not been running for several months.

Columbia Mining Company.—Two bodies of good free-milling ore are being exploited on Silver Creek, one in a shaft, the other in a tunnel. Recent assays show values from $22 a ton up.

Golden West Mining Company.—Ore is being taken out in several places on the Benedict and Yellow Bird groups, recently purchased, and the Chilean quartz mill is soon to be started.

Lakota Gold Mining Company.—George Linn, Peoria, Ill., is president; John J. Stinger, Peoria, Ill.,

vice-president; Charles Linn, Peoria, Ill., secretary and treasurer. The company has been organized to operate the Grizzly Bear Mine, 5½ miles east of Hill City. John Traux, Hill City, is superintendent. The old 10-stamp mill has been torn down and a new mill will be built.

Titanic Gold Mining Company.—Work is to start again in the shaft, near Carbonate, after several months' idleness, and will be continued to quartzite.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Black Hills Copper Company.—Water has compelled a suspension of work on the 800 ft. level.

Empire State Mining Company.—The new machinery has been installed at the Golden Slipper Mine. Regular clean-ups are being made at the 5-stamp mill, on ore from the 250-ft. level. Sinking continues in the shaft.

Golden West Mining Company.—Percy Train, superintendent, has established a camp on the ground, near Rochford, and has men at work, principally on the Yellow Bird group. There is a 5-ton Chilean mill on the Benedict, which will be run during the winter.

TEXAS.

HARDING COUNTY.

(From Our Special Correspondent.)

C. G. Parsons has let a contract for a well to the Sour Lake Development Company.

Byrd Syndicate.—This well, 2 miles east of Sour Lake, is down 2,445 ft. The drillers are now in oil sand, and expect a gusher.

J. M. Guffy Petroleum Company.—This company is laying the pipe line to Beaumont, and the Higgins Oil and Fuel Company has the material on hand to erect a 55,000-bbl. tank on 10 acres of ground recently purchased.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Beaumont Oil Wells.—The Texas Western Oil Company has brought in a new well on the National tract. The Orange Refining Company proposes taking over the business of the Forward Reduction Company, and the Forward Oil Producing Company. The new company intends to lay a pipe line from Spindletop to Port Neches and to run a barge line from there to Orange to supply oil to the refinery, which the Forward Reduction Company had commenced building.

From the numerous contracts being made for wildcat wells and for operations at Sour Lake and Saratoga by many of the large companies it is quite evident that the consensus of opinion is that this field is not in good condition. The salt water area is spreading rapidly, and wells that have been large producers are dry, or are producing from 25 per cent to 90 per cent water. While more wells are being pumped than in September, it is doubtful if the output of oil is as large, for salt water producers are steadily increasing. The question is now not whether Spindletop will produce oil in quantity for the next 10 years, but whether it will for one year. It is safe to assume that the 1903 production will not nearly equal that of 1902, and that many small companies whose only holdings are on Spindletop will be forced out of business.

UTAH.

Ore and Bullion Settlements.—The October ore and bullion settlements were $2,167,135, and for the 10 months this year $16,784,581. The report for the week ending November 7 is: Bullion, $270,300; gold, silver, lead and copper ore, $272,500; gold bars, $134,900; total, $677,700.

BEAVER COUNTY.

(From Our Special Correspondent.)

Cactus.—In this property, owned by Samuel Newhouse, at Milford, chalcopyrite ore is reported cut nearly 400 ft. west of strikes already made.

Horn Silver.—This Frisco mine sent 4 cars of high-grade ore to the samplers in the Salt Lake Valley for the week ending November 7.

Majestic Company.—A. B. Lewis, president of this company, has made final payment on the Harrington-Hickory and Gotham groups of $42,500. It is stated the company now owes nothing, and has title to all its holdings.

BOX-ELDER COUNTY.

(From Our Special Correspondent.)

Ione Company.—The management has decided to equip the property with gasoline engine, compressor and drills.

Isabella.—A contract has been let for 500 ft. of work in this Park Valley property.

West Century.—At 700 ft. from the mouth of the tunnel a body of ore is encountered.

White Rock Placer Company.—The directors recently declared a dividend of $2,000, or 1c. per share, as the result of the clean-up of the sluice boxes since last August.

PIUTE COUNTY.

(From Our Special Correspondent.)

Annie Laurie Company.—This Gold Mountain property continues to yield well. At the annual meeting the following officers were elected: L. C. Huch, president; A. A. Ball, treasurer, and A. W. Thompson, secretary.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—The samplers report the following shipments for week ending October 31; Mammoth, 11 cars; Uncle Sam, 5 cars; Bullion-Beck, 12 cars; Eagle & Blue Bell, 5 cars; Gemini, 14 cars; Showers Consolidated, 1 car; Lower Mammoth, 5 cars; Yankee Consolidated, 7 cars; Victor, 2 cars; Plymouth Rock, 1 car; Star Consolidated, 1 car. For the week ending November 7 shipments were: Yankee Consolidated, 8 cars ore; Ajax, 2 cars; Lower Mammoth, 2 cars; Eagle & Blue Bell, 4 cars; Bullion-Beck, 9 cars; Mammoth, 6 cars; Uncle Sam, 10 cars; Gemini, 7 cars.

Carisa.—The connection from the Sioux-Ajax tunnel in Tintic has been driven 269 ft., with about 300 ft. more to go before the Northern Spy ore bodies are reached. Four thousand feet of pipe line has been laid for water from the Mammoth Mine to furnish a good flow at much reduced rates. The management states it has uncovered 4 ft. of lead ore in a cross-cut off the 700-ft. level, quite separate from anything yet opened.

Blaine.—The ledge tapped at 225-ft. depth is reported well defined, and has yielded some high-grade lead ore.

Mammoth.—It is reported that a new ore body has been opened on the 900 level northeast of the shaft.

Lower Mammoth.—The iron sulphides are reported maintaining an average of 20 oz. silver, 3 per cent copper and $2 gold per ton. A shipment of ore is now awaiting transportation.

Tetro.—At this property the new compressor and hoist are in operation. The mine had to shut down, owing to the suspension of the Godiva Company, from which it secured power.

PIUTE COUNTY.

(From Our Special Correspondent.)

Sevier Consolidated Gold Mining Company.—This recently organized company, of which W. E. Maison, of Ogden is president and H. C. Lawrence secretary and treasurer, has purchased of Charles Lammersdorf, of Richfield, the Sevier Group of claims on Gold Mountain for $100,000, $10,000 as first payment being made through the banking house of McCornick & Co. Associated with the men named are Washington, D. C., men. The Sevier is a neighbor of the Annie Laurie.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—The United States Company sent 8 cars to the sampler, the New England Company 1 car, the Ben Butler 2 cars and the Storey and Phoenix each 1 car during the week ending November 7.

American Smelting and Refining Company.—It is said that the Germania plant will not be closed, owing to the increased production from many of the camps.

Bingham Consolidated.—The 1,725-ft. tunnel to tap the ore shoots of the Commercial group has reached the ore.

Bingham-New Haven Company.—The new compressor is in commission, and the tunnel to connect with the Zelnora and Morning Star ledges will be rapidly pushed. Winter accommodations for 25 men are ready.

United States Smelter.—Accidents to the blowing engine and the tramway at Bingham have set back the starting of the plant. Repairs to the engine will take some time. The tram is now in shape again. With no other hindrances the plant will soon be in full swing.

United States Company vs. Enos A. Wall et al.—The case is now before Judge Riner. The case has been remarkable for the short time taken to hear the testimony and the arguments.

Utah Consolidated.—Five cars of copper bullion, aggregating 300,000 lbs., went east to refineries during week ending November 7.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Park City Shipments.—For week ending October 31 the Mackintosh sampler reports the following receipts: Daly West, 3,906,630 lbs. ore; Ontario, 947,130 lbs. ore; Anchor, 219,620 lbs. ore; Loring, 151,700 lbs. ore; Silver King, 2,100,250 lbs. ore; total, 7,325,330 lbs. ore. For the week ending November 7 the Mackintosh sampler reports the following receipts: Ontario, 1,167,660 lbs. ore; Daly West, 2,152,600 lbs.; Anchor, 222,020 lbs., and Silver King, approximately, 1,500,000 lbs.

American Flag Company.—Manager John Rhodin, of this Park City property, has taken some rich samples of gold and silver ore to Salt Lake. It is expected that a car of ore will soon be shipped.

Avondale Mining Company.—This company has decided to go after the ores in the Denver group, in Park City.

Comstock.—The main building of the new concentrator on this Park City property is nearly completed and ready for the machinery. Ore bins are being built, and if everything goes smoothly the mill is expected to be running by February 1.

Creole.—In cleaning out the old workings preparatory to new work, ore has been found in several places.

Daly—Judge.—News of the opening of an ore body 1,000 ft. in this property, has been given out, but claims are made that it is but the continuation of the ore body of the Anchor into the Bannister claim. It is stated the ore body is located in the extreme western end of the McSorley drift on the 1,200 level.

J. I. C. Company.—The air compressor is now in position and in commission.

Lone Pine.—At this claim, in Snake Creek District, and west of Park City, a 6-in. streak of chloride of silver with other ores is reported.

Wabash Company.—Col. Treweek says the various rumors of litigation ahead are false.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—The Hidden Treasure of Dry Canyon sent in 2 cars, and the Hercules 1 car for the week ending October 31. The Cygnet reports the shipment of 3 cars of ore to the samplers at Salt Lake during the week ending November 7.

Four Metals Company.—George L. Moats, manager, reports a new find in the bottom of a 30-ft. shaft of 4 ft. of ore, averaging from samples taken, 59 oz. silver and 67 per cent lead.

Sacramento Company.—The development of the cinnabar ores at this Mercur property goes on systematically. It is stated arrangements may be made for the reduction of these ores, which are said to run well in mercury.

Utah.—This mine, at Fish Springs, shipped 1 car of good smelting ore to the Taylor & Brunton Sampler during the week ending November 7.

FOREIGN MINING NEWS.

AFRICA.

TRANSVAAL.

Despite the rather pessimistic reports as to the difficulty of obtaining native labor and in regard to the general industrial situations at Johannesburg, the aggregate production of gold from the Transvaal mines continues to make steady progress. The output for the month of September was 170,802 oz. of fine gold, which compares with 162,750 oz. in August and with 31,936 oz. in September, 1901. For the 9 months ending with September this makes the total 1,139,573 oz. fine gold, or $23,554,974. In 1901 operations were resumed in May, and up to the end of September the production was 113,626 oz.

Taking the returns of individual mines, we find that the Robinson maintains its position as the largest and one of the most consistent and profitable producers on the Rand, its output being 271 oz. more than in August, and the profit £27,500, as compared with £25,000. The largest increase for the month, however, is that of the Geldenhuis Deep, the production for September rising to 7,889 oz., as compared with 6,956 in August. Henry Nourse shows an increase of 699 oz., Salisbury 672 oz., Durban-Roodepoort 650, and Angelo, Durban-Roodepoort Deep, and Langlaagte Estate each had an increase of more than 400 oz. Only two new producers have recently made their appearance, returns having come to hand from Knight's Mine for August and September, and from Nigel for September only. On the other hand, New Heriot seems to have closed down, no returns having being received in the last two months. Several mines acknowledge a falling off in their gold product for September, as compared with the previous month. The most serious shrinkage is 1,280 oz. in the case of Ferreira Deep. Rietfontein "A" had a decrease of 288 oz., New Goch 260 oz., Ginsberg 229 oz., Roodepoort United Main Reef 201 oz., and there were small declines in the returns of Bonanza, City & Suburban, Jumpers Deep, New Comet, and Treasury.

RHODESIA.

The gold production in September is reported at 15,164 oz. crude. For the 9 months ending September 30 the total was 145,286 oz. crude, against 134,716 oz. in the corresponding period of 1901; an increase of 10,570 oz., or 7.8 per cent. The total this year was equal to 120,305 oz. fine gold, or $2,672,734.

MINING STOCKS.

(Complete quotation will be found on pages 668 and 669.)

New York. Nov. 12.

For several days after the elections the market was erratic, but on Monday of this week professional manipulators put in an appearance, hammering prices and rolling up th day's sales. The copper clique was the most active, and has inaugurated a new low record of prices. Amalgamated, which had been selling for some time above $62 in lots of less than 10,000 shares, was cut down to $54½ on Tuesday, when 97,700 shares changed hands.. This is the largest day's business in a long while, and the quotation is the lowest yet reported. Anaconda was sympathetically weak, selling down to 83 per cent ($20.75), which is $4¼ below par, and the lowest on record. On curb attention is given to a few specialties, which, however, do not show any large trading. Greene Consolidated had a good representation at the special stockholders' meeting recently, and voted unanimously to increase the capital stock from $6,000,000 to $7,200,000 to satisfy the company's indebtedness. The stock has a par value of $10, and sold this week at $24@$22⅞, while the rights to subscribe to the new issue brought $76@$50 per 100. Tennessee is firm and fractionally higher at $16¾, but dealings are comparatively small. United, of Montana, showed larger trading, though quotations were weak, $33@$30⅝ being the high and low marks. White Knob, of Idaho, is uninteresting, selling in a small way at $12. British Columbia hovers around $6, without initiating any important business.. Montreal & Boston is quoted at $2¾@$2⅝, just to keep it on the list. Union, of North Carolina, is silent, though brokers offer the stock at $2¾.

Keystone Gold, of Nevada, a recent addition to the curb market, shows better form, rising to $1¼ from 62½c.

On 'change the Comstock stocks have improved. Consolidated California & Virginia selling up to 90c., and Ophir at $1.05. Ophir has just levied a 15c. assessment, which makes 30c. this year, or 15c. less than 1901.

Ontario Silver, of Utah, sold at $8.

Cripple Creek, Colo., stocks are slow of sale. Portland brings $1.75, Elkton 33@32c., and Isabella 32@29c.

The Virginia-Carolina Chemical Company, the Southern fertilizer combination, is floating $7,000,000 5 per cent collateral trust sinking fund gold bonds at 98, redeemable to the amount of $500,000 annually, beginning October 1, 1904, at 102½, and the whole issue is subject to payment at any interest period upon 60 days' notice at 105. These bonds are secured by deposit and pledge of $9,881,300 capital stock of the Southern Cotton Oil Company, and $2,209,200 capital stock of the Charleston (S. C.) Mining and Manufacturing Company, which stocks represent an expenditure to the Virginia-Carolina Chemical Company of more than $13,000,000.

Boston. Nov. 11.

(From Our Special Correspondent.)

About everything seems to have gone by the board in the market, and despair reigns. The heavy liquidation in railroad and industrial stocks has finally affected copper shares, and while there has been a heavy tone since election day liquidation seems to have set in in this class of securities, and prices are off materially from a week ago. There was a general expectation that the market would be better after the election, particularly if the Amalgamated people were victorious in the Montana election. Although they did not carry the day it would seem as if they had been favored more than the opposition, Heinze. Notwithstanding this, United Copper bobbed up from $30.50 bid the Monday before election to $33 the Wednesday after, with subsequent reaction to $31.62½. The market for Amalgamated Wednesday was thoroughly disappointing, which cast a chill on the whole mining list, and nothing has happened in the meantime to change this condition of affairs.

The declaration of a $5 Calumet & Hecla dividend brought no response, probably because it was no change from the two previous payments. Twenty dollars is about what can be expected in dividends from Calumet with copper at its present price. With this $5 distribution $79,850,000 will have been paid to stockholders. The break in Amalgamated to $55.50 has caused a drop of $10.75 in the price of Copper Range Consolidated in the week to $53.75. No reason other than liquidation explains this break. The railroad is now hauling 4,200 tons of rock per day. Osceola has dropped $7 to $1.40 on rather heavy dealings to-day. United States has slid off $2.12½ to $19, notwithstanding the fact that the smelter is about ready to start.

Dominion Iron and Steel stiffened $1.50 to $61.50 last week, but ran off to $54.50 with the rest of the market. The Montreal people were apparently ready to give the stock a lift, but the turn of events marketwise caused them to change their plans, and they have turned sellers. Tamarack has lost $5 to $150, but offerings seem to be fairly well taken. Mohawk has lost $6 to $39.50, the decline being accentuated by continued assessment talk. Centennial has fallen $4.62½ to $15, on pressure to sell long stock. It is believed that the Arcadian people have been late buyers of Centennial stock. Bingham Consolidated has fallen $2.50 to $25.50 on lack of support as offerings have been very light. Mass mining spurted a fraction to $14.87½, but market conditions were against continuing the rally further, notwithstanding the effort was a concerted one. Calumet & Hecla is again quoted at $495.

The Stock Exchange has stricken the 130,000 shares of Santa Ysabel Gold Mining stock from the list, and has added the Atlantic Mining Company's 100,000 new shares, par $25, with $9.80 paid in, to the unlisted department.

Colorado Springs. Nov. 7.

(From Our Special Correspondent.)

The market made a general advance all along the line, and the week closes with prices upon a higher level than they have been for some time past. The improvement is without question due to the election held this week. The change is not to be regarded in the light of a boom.

As to the market itself almost every stock scored an advance to-day. With Tuesday out, on account of election, business in the fore part of the week was dull and prices correspondingly flabby. Acacia advanced from 8⅞ asked to 9c.; Coriolanus from 4 to 4⅛c. bid; Elkton from 34 bid to 34¾c. bid, with 35⅛c. asked. C. K. & N. sold from 9⅜ to 9⅞c. today, 10,000 shares changing hands at that figure and 9¾c. Doctor-Jack Pot indicated an advance from 12¼ to 12¾c. El Paso was also active and higher, selling from 68½ on November 1 to 70¾c. to-day. Gold Dollar Consolidated was the subject of lively speculation, selling from 4¾ to 5⅛c. on the report that the old ore shoot had been recovered in the lower level of the mine, which statement, however, cannot be verified. Lexington sold at 5¼c. during the week upon the announcement that the company had canceled all leases on the property and intended to commence operation on company account in the near future. Pharmacist sold from 5¾ to 6c., and back to 5⅞c. this week. The mine is being operated by a number of lessees, several of whom are adding good royalties to the company's treasury. Pointer sold at 2 and 2⅛c., advancing with the general strength of the market. Isabella weakened a little bit during the week, closing with 33 bid and 33¼c. asked. Little Bessie sold at 4 and 4⅛c. to-day, and was in some demand on account of the resumption of sinking operations in the main shaft.

The Prospect list was fractionally higher, although no noteworthy gains were made.

Salt Lake City. Nov. 7.

(From Our Special Correspondent.)

This week's business appears quite small, but taking into consideration the interest over the elections the totals are in proportion to other weeks. Prices have not held up, the decline being all along the list, with one or two exceptions. The main interest has been centered in Tintic's various mines. The Carisa sold 15,900 shares at 21¾@20½c., and Lower Mammoth, which has caused much guessing, has sold 16,700 shares at $1.59@$1.46½, a falling off of 4c. from last quotations. May Day sales were 41,700 at 28@22½c., being 3c. over last week. Park City's mines seem very quiet, the largest sale being in California, 41,600 shares, at 35¼@32c., a point lower than last week; Daly, Daly-Judge, Daly West and Wabash all went down. Wabash worst of all. This stock has steadily fallen during the last 2 weeks from $1.90 to $1.01¼ at the close; 15,910 shares changed hands at $1.38½@$1.01¼. Daly sales were 600 shares at $1.91½@$1.90, or 9 points off; while Daly-Judge retreated to $9.20@$10,with sales of 565 shares. Daly West is but a few cents lower, a few shares having sold at $49.40, and some as high as $50. Total sales were 427 shares. The Nail Driver, which last week sold at $2.15@$1.75, has kept within these limits, 3,150 shares changing hands at $1.92½@$1.79.

Mercur's propositions show little change. Consolidated Mercur sold 2,000 shares at $1.91@$1.90, and Ingot, which is off a few cents, sold 12,000 shares at 13⅛@11¼c. Sacramento showed little change, 3,000 shares selling at 26@23¾c. Century, of Park Valley, has kept down to 95@84½c., with 20,100 shares coming out, and towards the close rose around 92@93c. The total sales for the week were 250,160 shares, valued at $148,201.

San Francisco. Nov. 8.

(From Our Special Correspondent.)

The market opened heavy this week, but was somewhat revived by larger buying orders at the low prices. Quotations were very irregular, however, though there was tendency to more firmness after the election holiday.

Some quotations noted are: Caledonia, $1.20@$1.25; Ophir, 92@94c.; Consolidated California & Virginia, 87@89c.; Mexican, 42@45c.; Overman, 23c.; Best & Belcher, 20c.; Sierra Nevada, 18c.; Potosi, 13c.

Business in oil stocks was better and prices firmer. Peerless sold at $8.25; Home, $2.80; Monte Cristo, $1.05@$1.10; Independence, 4c. The largest trading was in Home and Independence.

London. Nov. 2.

(From Our Special Correspondent.)

The South African mining market has not taken at all kindly to Mr. Chamberlain's proposition to proceed to South Africa to study affairs on the spot. The mine owners do not seem to be anxious that he should have first hand information, and so be able to estimate at their proper value the representations made to him by the various interests. To tell the truth, the mining magnates are making themselves unpopular here by the continual airing of their real and imaginary grievances, and they are strongly suspected in many quarters of stirring up disorder and dissatisfaction, and inventing labor troubles in order to force the hands of the government. They fomented the war spirit in previous years in the hopes they would be able to overturn the Boer Government and get things their own way, and now that the British Government is not likely to be as pliable as they expected, they appear likely to go back to the old tactics. Of course, these remarks are not intended to refer to every mining magnate. The majority are loyally willing to bear their share of the financial burdens. These men, however, keep quiet, and, as usual, have to suffer from the effects of the ravings of their noisier conferes. Another reason why the market takes unkindly to Mr. Chamberlain's visit is that it means that the settlement of South Africa is considerably delayed, and that the future of the mining industry cannot be properly gauged for an indefinite period. Anyway, the market has been uncertain and shaky.

The British Columbian market continues very depressed. Both Le Roi and Le Roi No. 2 have been falling in price on the circulation of rumors that the grade of ore is falling, and in spite of reassuring statements of the directors, shareholders and the public take a very gloomy view of the future of these two companies.

The report of the Electrolytic Alkali Company, which operates the Hargreaves-Bird process, for the year ended August 31, shows that the company is progressing satisfactorily, if slowly. The profit for the year was £7,662, and this was earned almost entirely by the original 56 cells. The issue of £100,000 new capital made in the spring was entirely successful, but the new plant erected commenced work a week or two before the end of the company's financial year. At the time of writing the second set of 56 cells is in full working order, and further cells are being erected. In spite of the break in the bleaching powder market, there is no falling off in the demand, as, however, much bleach is overproduced in various chemical centers, the company's product is always sure to be in demand, owing to its permanent dryness. The profits of the year have enabled the company to pay off the interest due on cumulative preference shares. These shares, bearing 7 per cent interest, should be a very good investment, and their ordinary shares should be an excellent speculation.

COAL TRADE REVIEW

New York, Nov. 13.

ANTHRACITE.

The daily press shows as much ignorance about present conditions in the coal trade as it displayed at any time during the strike. Some papers wildly assert that the operators are not telling the truth about shipments, and that retail dealers are misrepresenting for a purpose the amount of coal received. Such papers apparently cannot realize that when the miners returned to work the country was short some 20,000,000 tons of its normal supply of anthracite, that the present output of the mines is only about 75 per cent of full capacity, and that the miners are more intent on making the most of their apparent victory than on supplying public needs. Again, car supply at the mines is none too good, and many cars are in need of repairs. The miners of the Lehigh Coal and Navigation Company are still idle, reducing considerably shipments to New York Harbor.

The anthracite commission has received the operators' replies to John Mitchell's allegations, and is beginning to collect evidence. There are already indications that the commission will not investigate deeply some of the causes that prolonged the strike, and fears are expressed that instead of going to the bottom of things the commission will merely skim the surface and get out a report that will satisfy neither side, but will merely patch up the situation for a year or so, leaving every opportunity for another strike in 1904.

But very little coal has gone up the lakes since the miners returned to work, and the prospect of any considerable amount arriving at Duluth before navigation closes is very poor indeed. In Chicago territory demand is very lively, with little coal to be had as yet. Along the lower lakes some coal is arriving, but demand is far in excess of supply. The all-rail

trade is receiving most consideration from the operators, as is to be expected. But little coal has arrived at points beyond Cape Cod, and many points along Long Island Sound want coal badly. At New York and Philadelphia, there has been most clamor over short supplies, and the inability of dealers to supply everybody immediately with all the coal wanted. The situation is slowly improving, but it will take a month yet before things are in fair shape. The price now quoted for egg, stove and chestnut sizes of free-burning white ash is generally $5 f. o. b. New York Harbor shipping ports. The regular retail price at New York is $6.50@$7.

BITUMINOUS.

The Atlantic seaboard soft coal trade shows a good steady demand, though speculative prices for Clearfield grades range around $5@$5.25 f. o. b. New York Harbor shipping ports. The speculative market is not particularly active, partly owing to the free arrivals of the small sizes of anthracite at tidewater. This washery coal is selling at $2@$2.50 for buckwheat size f. o. b. New York Harbor shipping port, and is in good supply. Producers having contracts are now concentrating attention on the shoal water ports down East, and getting coal forward as fast as car and vessel supply permit. The demand for vessels for anthracite shipments has advanced coastwise freight rates, and further advances are expected.

As to next year's business there is considerable diversity of opinion in the trade. Producers of the lower grade coals show a desire to cover a large part of their possible output by contracts. Producers of the higher grade coals are talking of cutting down on contract tonnage next year, and some producers even talk of not contracting any of their output. As regards freight rate changes a few men have expressed the view that public opinion will deter the main line roads from making higher rates on coal, but there seems to be an idea widely held that the railroads will advance through rates materially next spring.

There have been recently heavy arrivals of foreign coal at points beyond Cape Cod, and the market there is fairly easy. The Maine shoal water ports are receiving most attention from producers, and it is believed that producers now have their contracts for these ports well in hand. Along Long Island Sound consumers are calling for all the coal covered by contracts that they can get, and where shortages develop are buying some coal in the speculative market. At New York Harbor, as at points beond Cape Cod, recent arrivals of foreign coal have helped take the edge off the speculative market. Most consumers are pretty well provided for. In the all-rail trade conditions are worse than elsewhere, and some manufacturing concerns are still unable to run full time, owing to a short fuel supply.

Car supply and transportation continue to be the bane of producers. The latter has improved somewhat, coal coming through to tidewater in about a week. Car supply is very poor and irregular. Producers can rely on getting only about 30 or 40 per cent of their needs. In the coastwise vessel market small craft are very scarce, and large vessels are in better demand. Rates are advancing. We quote current coastwise freights from Philadelphia as follows: Providence, New Bedford and Long Island Portland, $1@$1.10; Newburyport, $1.35@$1.40; Portsmouth, $1.15; Gardiner and Bangor, $1.25@$1.30, with towages to former port; Lynn and Bath, $1.15. Rates from the further lower ports are about 10c. higher.

Birmingham. Nov. 10.

(From Our Special Correspondent.)

There is a slight improvement in the coal production in Alabama, the railroads making efforts to supply the mine with more cars. The railroads are also improving their locomotive power, and in a short time it is believed that the mines can operate full force. This state of affairs has held down the production much in this State, and has given rise to much complaint on the part of Alabama operators. There is a demand for every ton of coal that can be gotten out, and good prices prevail. All the new companies in this State report plenty of business, and only fear that a full supply of cars will not be furnished.

The coke production in Alabama is holding up well, but there is a shortage of coke, and as a consequence the product brings a high price. Much coke is being imported from other States into this district to supply all demands.

Chicago Nov. 10.

(From Our Special Correspondent.)

Sales of coal, so far as wholesalers are concerned, continue satisfactory, though somewhat lighter tha nis normal for the season, on account of the mild weather. The demand from city and country for anthracite is heavy, and as yet but little has reached the city. Two boat-loads came in last week—the *Denver*, consigned to the George Lill Coal Company, brought the first cargo since the strike ended, of 1,911 tons. This vessel arrived in the North Branch last Wednesday, and its contents have been disposed of mostly at retail at $8 a ton. The *Niagara*, consigned to O. S. Richardson & Co., followed the *Denver*, and brought a little more than 3,000 tons. A few scattering car-loads have been received, and more are understood to be on the way. These go to local firms and to the Northwest. The wholesale price of anthracite, on cars, is nominally $7, but sales have doubtless been made at $1 to $2 in advance of this figure. Retailers throughout the Chicago District are disposing of the small surplus stock held in reserve during the strike, at $9@$10. Reports from Buffalo and Erie indicate that there will be a heavy rush of coal by lake westward before the closing of navigation, December 5 to 10. The demand for anthracite, however, is much greater than the supply is likely to be throughout the winter.

Bituminous prices have declined somewhat, in consequence of the arrival of anthracite and the prospect of a steady if not large supply of the re-opened mines. The supply of Eastern coals is better than it has been for several weeks; Hocking is fairly plentiful, and sells at $5, on cars; Youghiogheny also commands $5; West Virginia, $4.50; of smokeless grades Pocahontas and New River are somewhat scarce at $5.50; smokeless Maryland sells at $5, and the supply is reported to be good. Of bituminous grades, which still form the bulk of sales both wholesale and retail, there is a plentiful supply; Illinois lump runs from $2.75@$3.25, and Indiana lump, $3.25@$3.50. The West and Northwest are reported to be buying largely of bituminous grades, in expectation of trouble during the winter from car shortage on the railroads.

Cleveland. Nov. 11..

(From Our Special Correspondent.)

The coal market on the lakes is rapidly drawing to a close for this season. The shippers might wish for a continuation of it, but the conditions are not favorable. Those who understand the history of the market for the prevailing year are just a little puzzled to know what is likely to occur later in the winter in the Northwestern portion of the country, as the shipment from the lower lakes are far short of the requirements. The shippers here have been fighting to prevent this shortage, fearing that it would drive the customers to other markets, with which they would become acquainted, and prefer them to the present dependence upon coal from the lower lake region. However well that fear may be based, the outcome seems inevitable. There is a great shortage of hard coal in the Northwest, and the slight increase in the amount of bituminous coal shipped will by no means overcome that shortage. This is throwing the Northwest upon its resources, and even though the shippers might wish to prevent such a calamity they cannot. The car situation is such as to be beyond hope for the remainder of this season. One shipper yesterday made the statement that for the last two weeks he has been getting an amount of coal equal to one-sixth of the normal amount at this time of the year. Fuel coal for ships is even harder to obtain, and the market generally is weak, because there is not enough cars with which to move the material. Some have vaguely hoped that when the East becomes supplied with hard coal some equipment may again be turned back into this section to help out. The hope is vain, and the industries of this section are therefore facing the worst coal and coke shortage that has been seen in years.

Pittsburg. Nov. 11.

(From Our Special Correspondent.)

Coal.—The car supply is a trifle better, but the mines are being operated very irregularly. The production in the railroad coal mines is not more than 50 per cent of the capacity. A number of mines have been closed for over a week. Those with river tipples are operating steadily and the product is being used in the mills along the river front. Prices continue firm and premiums are offered in many instances for prompt shipment. So far none of the mills has been completely closed for lack of fuel, but several have been operating half time for almost a week. The negotiations looking to a consolidation of the two combinations, the Pittsburg Coal Company and the Monongahela River Consolidated Coal and Coke Company, are progressing favorably, and it is reported that the deal is certain to be successful.

Connellsville Coke.—Production and shipments were better this week, but it is impossible to get enough cars to supply the blast furnaces, and many are still banked. It is estimated that fully 1,000,000 tons of coke are stocked in the yards ready to be sent out as soon as the railroads provide the facilities for shipment. The production each week continues above the 250,000-ton mark, but it cannot be moved. It is reported that contracts have been made during the week for over 1,000,000 tons of furnace coke for next year's delivery at $3 at the ovens. W. P. Snyder & Co. have bought the entire output of the Brown & Cochran ovens at Dawson. The *Courier* in its last issue gives the production for the previous week at 254,737 tons, a gain of 3,409 tons. The shipments for the week aggregated 10,558 cars, distributed as follows: To Pittsburg and river tipples, 3,843 cars; to points west of Pittsburg, 4,843 cars; to points east of Connellsville, 1,837 cars.

San Francisco. Nov. 8.

(Special Report of J. W. Harrison.)

Since the *Ditton* arrived here from Newcastle on October 10 there has been no delivery of Australian coal, and it will probably be at least 15 more days before any coal arrives from the colonies. The non-delivery of Newcastle coal will cause no material change in the market here, as there is a full supply of Coast coal on hand to meet all requirements.. At this season of the year the call for domestic grades is usually very brisk and will continue so for the next four or five months. The prices for these grades are being well maintained, whereas, fuel for steam purposes is being freely offered at price leaving a particularly small margin of profit to the importers. Some few brands of Colonial coal are becoming quite popular for grate and stove uses. Nine vessels—seven from Newcastle and two from Sydney—are reported on the list as coal carriers. There are 25 coal carriers on the engaged list for the Hawaiian Islands. This is a strong indicator how the local coal trade with the Colonies is shrinking, and the outlook for any marked increase of shipments is somewhat discouraging. It will be next to impossible for Colonial freight rates to reach such a figure as will enable importers to compete with the prices that will be named for British Columbia and Washington products.

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. Nov. 12.

Arrivals of coal from abroad have been large, nearly 50,000 tons being reported at New York and Philadelphia during the week. No more orders are being placed abroad, and the present movement is on contracts made early in October.

Imports of fuel into Germany for the 9 months ending September 30 are reported as below, in metric tons:

	1901.	1902.	Changes.
Coal	4,678,713	4,686,033	I. 7,320
Brown coal	6,103,210	5,827,176	D. 276,034
Coke	303,475	269,866	D. 33,609
Total	11,085,398	10,783,075	D. 302,323

Of the imports this year 4,811 tons were from the United States.

Exports of fuel from Germany for the 9 months ending September 30 were, in metric tons:

	1901.	1902.	Changes.
Coal	11,114,883	11,379,064	I. 264,181
Brown coal	16,639	11,554	D. 5,085
Coke	1,594,835	1,501,058	D. 93,777
Totals	12,726,357	12,891,676	I. 165,319

The heavier exports were to Holland and Austria. There were 10,813 tons sent to the United States.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of November 1, that the coal market continues weak. Quotations are: Best Welsh steam coal, $3.96@$4.08; seconds, $3.84; thirds, $3.78; dry coals, $3.84@$4.08; best Monmouthshire, $3.48; seconds, $3.42; best small steam coal, $2.40; seconds, $2.16; other sorts, $2.04.

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

Tonnage having arrived up more plentifully during the past week, rates have shown a downward tendency. Some rates from Cardiff are: Marseilles, $1.40; Genoa, $1.20; Naples, $1,26; Singapore, $2.76; Las Palmas, $1.62; St. Vincent, $1.80; Rio Janeiro, $2.76; Santos, $2.88; Buenos Aires, $2.16.

IRON TRADE REVIEW.

New York, Nov. 12.

The iron trade continues to be injuriously affected by transportation conditions, as is well known by the local reports which follow. Pig iron production is seriously affected by the difficulties in delivering coke, and many furnaces in the Mahoning and Shenango Valleys have been either banked altogether or have been obliged to reduce their production. Many furnaces will not be able to deliver iron contracted for the present quarter before April or May next, and the production of steel will be restricted to a corresponding degree. Effects of the practical control of the Connellsville coke region by the United States Steel Corporation are beginning to be very evident. The furnaces of that corporation and the merchant furnaces which are under contract to sell their products to the corporation are favored with deliveries of coke, while outside furnaces have difficulty in obtaining any at all.

A report given out to-day by the United States Steel Corporation shows that its earnings for September and October were $24,130,346, an increase of $2,651,761 over the corresponding period last year. Shipments of iron and steel for the two months amounted to 831,343 tons, while the orders on hand and unfilled on November 1 amounted to 4,968,002 tons of products of all description, against 2,831,592 tons at the corresponding date last year.

Imports of pig iron and steel billets continue on a very considerable scale, and under present conditions it seems probable that this foreign trade will extend over into next year.

Birmingham. Nov. 10.

(From Our Special Correspondent.)

There is much pig iron being shipped from this district; in fact, as much as is being manufactured. There is very little, if any, accumulation, and the prospects are that shipments will be pushed for some time to come. There is no change in the situation. The Tennessee Coal, Iron and Railroad Company this week put in blast Oxmoor furnace, which has been out for several years, and which has just been given a thorough repairing. The furnace will have a daily output of about 125 tons of iron, and W. W. McKeown, a capable furnace expert and chemist from Chicago, will be in charge.

The Sloss-Sheffield Steel and Iron Company, the second largest iron making company in the South, has all seven of its furnaces in full blast. The production is running over 30,000 tons of pig iron monthly. Directors and stockholders in the Sloss-Sheffield Company will spend this week in the Birmingham District looking over the properties of the company. A rumor has prevailed that an effort is being made to organize a company to unite all the smaller furnaces in the district, but nothing definite is to be learned of such a deal.

The following are the quotations: 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@$22; No. 2 soft, $20@$21.

Rumors as to a big steel plant at Thomas, to be constructed by the Republic Iron and Steel Company, are not verified by officials of that company. Charles Stewart, a furnace expert from New York, is in the Birmingham District for the Republic Company, but for what purpose is not stated.

The purchase of the Southern Car and Foundry Company by interests allied with the Standard Steel Car Company, of Pittsburg, Pa., will mean much for the Southern territory, it is believed. The plants of the Southern Car and Foundry Company located at Memphis and Lenoir City, Tenn., Gadsden and Anniston, Ala., will be improved, and it is not improbable, according to statements heard, that the pressed steel car works intended for Wylam, a suburb of Birmingham, will be erected. J. M. Elliott, the founder and president of the Southern Car and Foundry Company, it is understood, is to manage the plants in this section of the country.

Chicago. Nov. 10.

(From Our Special Correspondent.)

But little pig iron is being sold, compared with the record of a month ago. Probably more Northern than Southern is in the market, because of the lack of cars on all the important railroads, which is also seriously affecting coke shipments. Buyers of iron are at last beginning to realize that the price of iron is high and likely to continue high for several months, but that a drop must come some time; there is consequently apparent a disposition to buy less extensively for the future, and trust to a lowering of the price by the time the stock is actually needed. Sales are lapping into the second half of 1903; almost everything, both Northern and Southern, is reported disposed of up to July 1 next. To-day's quotations do not differ materially from those of a week ago; No. 1 Northern, $23.50@$24; No. 2 Northern, $23@$23.50; No. 3 Northern, $22.50@$23. Southern is variable over a range of $20 to $22 Birmingham, or $24.15 to $26.15 Chicago, depending on the amount of the order, the date of shipment (all for next year), and the brand, with No. 1 50c. higher and No. 3 50c. lower than No. 2 of corresponding grade. For delivery in 1902 a premium of $3 to $4 for both Northern and Southern is readily obtained. Everybody is demanding iron on cars before buying, and the problem of furnishing the commodity is resolving itself into the problem of railroading rather than of furnace management. The car shortage question bids fair to become of greater importance in the coming winter than the coke shortage question has been for the last three months.

Coke continues at $11@$14, with an eager scramble for whatever is on the market. Chicago users of coke see little prospect of a less price or better conditions of the market as regards the fuel, before next spring. Not enough coke can be secured for furnace purposes; several stacks are closed or closing. Foundry men see even less cheering prospects for the winter than furnace proprietors; the announcement that the Frick Company will not supply foundry coke on contracts after January 1 is causing much concern as to the source of supply for foundries.

Cleveland. Nov. 11.

(From Our Special Correspondent.)

Iron Ore.—The shippers of iron ore have been compelled to pay an advance of 10c. a ton out of Escanaba during the last week, this being the only change of any importance this season. The head of the lakes and Marquette are commanding the same old rates of 80c. and 70c., respectively. The season's shipments to November 1 were 24,020,000 tons, which predicts a total movement for the season, by lake alone, of 26,000,000 tons, to which will have to be added the 500,000 tons that usually come down by rail. The enormous shipments are due to some recent sales, and also to the development of a policy on the part of the Steel Corporation to collect as large a surplus as possible to provide against an emergency. The rates of carriage now are Duluth to Ohio ports, 80c.; Marquette to Ohio ports, 70c.; Escanaba to Ohio ports, 70c.; Escanaba to Buffalo, 75c. The prices have not changed from $4.25 for bessemer old range; $3.25 for non-bessemer old range and bessemer Mesabi, and $2.75 for non-bessemer Mesabi.

Pig Iron.—The curtailment of production because the coke supply is short has continued to be apparent. In fact, it is now the most distressing feature in the whole market. The furnaces have been shut down so much of late that they have no material for sale for this year; are not in position to take any more tonnage for delivery during the first half of next year; and have withdrawn from the market altogether, not being able to forecast when they will be in position to make any definite statement as to what they can do with future orders. This throws about all of the business either on the furnaces outside of this immediate territory or abroad. No further importations have been made, but more are likely to be announced soon. The prices have remained stable, nominally at least. They are: No. 2 foundry for spot shipment, $27@$28; for first half delivery, $23; for second half delivery, $21, Valley furnace; for first half delivery, $18.50@$21, Birmingham; and on imported iron, $24.50 for spot delivery and $21.50@$22 for first half delivery. Basic iron is quoted at $21 for first half delivery and bessemer at $23.

Finished Material.—There has been a falling off in demand for the lighter grades of steel that has been quite marked, and the increase of competition, together with the lessening of the demand, has been responsible for the reductions in prices announced. The first to fall was the sheet prices, followed by tin-plate and later by tubes, and now wire has been added to the list. In the plate market orders were taken up to the latter part of next year, with a good tonnage in sight, which has not yet been covered. The demand for the material at present is quite active for spot delivery, and the smaller mills are reaping harvests by selling at a premium, the prices being 2.10c. The jobbers are selling at 2.50c. for both sheared and universal mill plates. The larger mills are commanding 1.60c. The buying of structural steel has continued active of late, but with no big orders. The larger mills still have some uncovered capacity for the first half of next year, but have inquiries against most of it besides the business that is yet to develop. For immediate shipment the jobbers and the smaller mills are busy, the price out of stock being 2.50@3c., while that from the smaller mills is 2.60c. Bars are weak. It is reported that secret cuts have been made on both steel bars and iron bars. On bar iron it seems that 1.70c. is about the market price, although many of the mills pretending a big rush have insisted upon a quotation of 1.80c., which is fictitious.

Philadelphia. Nov. 12.

(From Our Special Correspondent.)

Pig iron has not been selling for a week. There is a rumor that a shading of prices is about to take place. Not a single concern admits there is anything in it. The rumor has originated from 2 or 3 large consumers, but they do not seem to have proof. The present supply of pig is not sufficient to meet the contracts already on books. Prices remain where they have been. There are too many small consumers here ready to buy to make it probable there will be any shading for a long time to come.

Steel Billets.—Importers are doing nothing at present. Two or three consumers stated to-day that they will not be in the market for some weeks. Importers have been sounding the ground to see what they can do at $27. American billets are quoted as high as $33.

Bars.—About the only business traced up this week has been in steel bars, for which there appears to be a quiet, steady and certain demand.

Sheet Iron.—Within two or three days appearances have improved from the standpoint of storekeepers who have worked off quite a lot of light sheet for quick delivery. The mill people are endeavoring to establish a good assortment of all kind at their stores. Very little new business is going to the mills.

Skelp Iron.—A few small orders for grooved skelp have just been landed, but there is not enough going on to call for comment.

Merchant Steel.—The only encouraging feature in merchant steel is that every user of it in our territory is running full time. But all of them are well protected by contracts.

Plates.—The manufacturers of plate in Middle and Eastern Pennsylvania have all they can do to keep their customers supplied. The smaller buyers, who never look out ahead, are paying premium prices for the little material they are able to get. The strong features still prevail, and it is not probable that manufacturers will overtake demand this year. Prices are unchanged.

Structural Material.—An unusual amount of work is planned in this city, but it all comes under the retail head. Information as to what the big customers may want is lacking. Representatives of structural mills say that the immense amount of bridge building now contemplated by railroads will keep things going as they are throughout the winter.

Pittsburg. Nov. 11.

(From Our Special Correspondent.)

While the railroads did remarkable work on Sunday in the moving of freight the result is scarcely noticeable and the congestion appears to be as great as ever. The Valley furnaces are not receiving 25 per cent of the coke required, and nearly all are banked. Those that are in operation are not turning out more than three days of the normal production in one week. There is no improvement in sight. The independent furnaces are the greatest sufferers, as the Frick Company seems to be able to dictate to the railroads as to coke shipments and the furnaces of the big steel corporation are favored. The railroads are held responsible for the unequal distribution of coke, but all protests are ignored, and the unsatisfactory condition of affairs is likely to continue for some time. The merchant furnaces are so far behind in deliveries that no predictions are now made as to when they will catch up. It seems certain that iron contracted for fourth quarter delivery will not leave the furnaces before April 1. The United States Steel Corporation has dropped negotiations for its outside pig iron requirements for the second and third quarter, according to one report; but another says that they are going on. From present indications it will not get any deliveries on the iron ordered for the first quarter until April or May. The furnaces that get coke from the corporation's ovens next year at the $3 rate will be expected to make low prices for iron. A failure to do this will result in the cancellation of coke contracts, as the steel combine reserves the right to cut off the supply under contract on 30 days' notice. Contracts for coke have been made at a much higher figure than that fixed by the H. C. Frick Coke Company. No new business has been taken on by the furnaces during the week, and it is impossible to get prompt bessemer iron at any figure. It is reported that a contract for 1,000 tons of foreign foundry iron for delivery here in December was made at $25. There is but little activity in the foundry iron market. A good order for basic iron for delivery during the first half was booked this week at $21.75 delivered at Pittsburg.

The steel market has strengthened considerably during the week. This was indicated by the opening of negotiations for 5,000 tons of German bessemer steel billets. It is probable that the deal will be closed this week, and that the price will be $29.50, delivered at Pittsburg. Domestic billets have advanced to a trifle above that figure. Bessemer sheet bars cannot be had here at any price. One sale of open-hearth sheet bags at $31.75 is noted, and a small lot was sold at $32. About 10,000 tons of steel plates have been contracted for within a week at the base price for future delivery, but heavy premiums are offered for prompt shipment. A large business is being done in steel bars, sales for the past few days amounting to about 8,000 tons. The demand for structural material continues heavy, and contracts placed during the week aggregate close to 20,000 tons. Steel rail orders have been steadily coming in, and so far it is estimated that 1,700,000 tons have been contracted for, which with about 300,000 tons that will go over from this year, will keep the steel rail mills busy until September 1. The production for 1903, it is believed, will be about 2,800,000 tons. The cut in the price of tin plate to $3.60 a box has resulted in the booking of considerable new business, and the American Tin Plate Company is likely to have all of its mills in full operation by December 1.

The bi-monthly examinations of the sales sheets in iron, tin-plate and steel sheets will be made this week under the annual wage scale of the Amalgamated Association of Iron, Steel and Tin Workers to fix the wages for November and December. The examinations will be a mere matter of form, as there will be no change. The selling prices of sheets and tin-plate during the past two months have been under the base of the scales. In bar iron, prices have been up, sales having been made at 1.80 to 2c. At present the puddlers and finishers in the rolling mills are being paid on a basis of 1.60c. As some large contracts are being filled that were taken at a lower price it is not likely that the average will exceed 1.60c. and present wages will be continued.

Pig Iron.—There have been no transactions in pig iron of any consequence during the week. Prompt bessemer iron would bring probably $24; Valley furnaces, and for deliveries during the second half, $21.50 @ $23, Valley, is quoted. Foundry iron No. 2 is quoted at $23.75, Pittsburg, and gray forge at $21@ $22, Pittsburg. About 1,500 tons were sold this week at $21.50.

Steel.—There is but little buying, but prices are firmer, bessemer steel billets having advanced to $30@ 831, Pittsburg. The plate market is extremely active and for delivery within the next two months from 1.85 to 2c. is asked. Steel bars continue in good demand, and some large orders have been booked.

Sheets.—Prices are unchanged, and the market is stronger this week. The American Sheet Steel Company continues to quote black sheets No. 28 gauge at 2.75c. and galvanized at 75 and 10 per cent off.

Ferro-manganese.—There is no domestic 80 per cent in the market, and the price of the foreign product ranges from $50 to $51.50.

New York Nov. 13.

Pig Iron.—The market is quiet, consumers buying only for immediate needs. We quote for 1903 delivery, Northern irons at tidewater: No. IX 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 continues good. We quote for large lots on dock: Refined bars, 2@2.05c.; common, 1.90@1.95c.; soft steel bars, 2@2.10c.

Plates.—There is a good, strong demand. 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 quoted at $28, f. o. b. mills for 1903 delivery; light rails, $30@$36, according to weight. Relaying rails are $28@$30 for heavy sections and $33@$35 for light sections.

Structural Material.—Buying is still active. 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.

CHEMICALS AND MINERALS.

(See also wholesale prices on page 670.)

New York, Nov. 12.

Trade has quieted down.

Exports are limited, owing to the aggressive competition with Great Britain and Germany. The largest business is being done in phosphates and copper sulphate, and while the former has increased the latter shows a heavy falling off from last year.

Imports, with few exceptions, are larger, notwithstanding the tariff on some important articles. Our receipts of raw material, notably brimstone and pyrites, are growing in the face of high prices, because we are not yet in a position to supply the demand.

Heavy Chemicals.—Demand for deliveries on contracts is good, but shipments are delayed by inadequate car supply. Some new forward contracts are noted at unchanged prices. Ordinary bicarb. soda is higher. Bleaching powder lacks interest, as the larger consumers are about placed for next year. Sal soda, owing to cooler weather, is lower in price.

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, $1.25, and extra, $3; sal soda, 55@ 60c.; chlorate of potash, $7.50@$7.75, for immediate shipment, and $7@$7.12½ for contracts; bleaching powder, next year's delivery, $1@$1.25. 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 $7@$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.

Imports of heavy chemicals into the United States this year included the following, in pounds:

Substance	Sept. 1902	Nine months 1902	Nine months 1901
Bleaching powder	6,901,542	87,358,467	$1,091,413
Soda ash	2,673,649	20,163,211	19,472,387
Caustic soda	201,136	2,546,260	2,694,561
Sal soda	534,000	3,027,844	3,288,258
Chlorate of potash	55,459	925,932	588,143

Deducting the following re-exports in the 9 months ending September 30, 1902, there remains for consumption:

Substance	Re.-exports 1902	Entered for Consumption 1902	Entered for Consumption 1901
Bleaching powder	168,768	87,189,699	$1,090,037
Soda ash	32,672	20,130,539	19,129,723
Caustic soda	967,696	1,578,564	2,013,569
Sal soda	.....	3,027,844	3,288,088
Chlorate of potash	153,944	771,988	373,743

These statistics show that the consumption of foreign bleaching powder has increased 7.5 per cent this year; alkali, 5.3 per cent, and chlorate of potash, 107 per cent; while caustic soda fell off 21.6 per cent, and sal soda, 7.9 per cent.

Brunner, Mond & Co., Limited, of Liverpool, Eng., has just declared an interim dividend for the half-year ended September 30, at the rate of 30 per cent per annum, payable December 6.

Cryolite.—Consumption is good in the chemical manufacturing industry, but in the last few years our imports from Greenland have fallen off. In 1901 they were 5,383 long tons, valued at an average of 5½c. a lb. Present price is 6½c. a lb., f. o. b. New York.

Acids.—Consumers are beginning to place contracts for next year's delivery at current prices. Muriatic and sulphuric attract most attention. Blue vitriol is unsettled, as large imports are reported, notwithstanding the duty of ½c. per lb. Sellers of the foreign make offer at $4.50@$4.60 per 100 lbs., while domestic makers continue to quote at $4.70, though they appear willing to book orders at much less, just to appease competition. Oxalic acid for next year brings $5.25, while spot is $5.50.

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	$4.50@$4.70	Oxalic com'l	$5.25@$5.50
Muriatic 18°	1.50	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

Brimstone.—Spot is scarce. Best unmixed seconds rule at $24, on spots, and shipments $23@$23.25. Best thirds are about $1.75 less.

Pyrites.—Consumptive demand is good, and sellers obtain full prices.

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

Nitrate of Soda.—The spot and nearby market has advanced, owing to the increased demand and scarcity of supplies. Importers anticipate a $2 per 100 lbs. market. At present $1.95 is the lowest obtainable for New York and Baltimore spot delivery. Arrivals in January, February and March are firmly held at $1.95, which cannot be shaded. April arrivals are held at $1.90, May $1.87½, and June forward $1.85. Last week *Apolo* arrived at Baltimore with 49,795 bags. The coast market is higher, and nitrate is scarce, while ocean freights continue low. No business is being done in futures.

Messrs. Mortimer & Wisner in their monthly statement of nitrate of soda, dated New York, Nov. 1, give the following statistics:

	1902 Bags	1901 Bags	1900 Bags
Imp. into Atlantic Ports from W. Coast S. A. from Jan. 1, 1902 to date	1,122,784	1,111,677	921,707
Stock in store and afloat Nov. 1, 1902, in N. Y.	14,888	51,737	6,898
Philadelphia	.....	13,000	.....
Baltimore	49,770	46,000	500
To arrive, due Feb. 15, 1903	491,000	450,000	471,300
Vis. supply to Feb. 15, 1903	555,658	560,737	478,698
Stock on hand Jan. 1, 1902	77,517	13,446	9,586
Deliveries past month	201,290	98,395	128,630
Deliveries since Jan. 1 to date	1,135,643	1,014,386	925,958
Total yearly deliveries	.....	1,308,820	1,176,651
Prices current, Nov. 1	1.87½c.	1.90c.	1.82½c.

October deliveries were the largest in 5 years, and in the 10 months this year were nearly 12 per cent larger than 1901. Stocks on November 1 were 64,658 bags, which shows a decrease of 46,079 bags, as compared with the corresponding date last year.

It is gratifying to see new oficinas with moderate capitalizations earning good profits, and paying large dividends. Two of these, Santa Catalina and Santiago, paid 20 and 18 per cent in dividends for the year ended June 30, and have placed satisfactory amounts to reserve fund. High market prices for nitrate, iniatiated by a curtailed production, is proving beneficial to many other oficinas. In fact, the industry is in a better condition to-day than it has ever been.

Concerning the Chilean market, Messrs. Jackson Brothers, of Valparaiso, write us under date of October 4, as follows: A fair demand sprung up during the fortnight and about 850,000 qtls. have changed hands. Prices have advanced considerably, due to the small quantity of nitrate disposable up to March 31, 1903. Sales of 95 per cent have been effected at 6s. 4d. @ 6s. 5½d., alongside for October-December, and at 6s. 2½d. alongside for January-March deliveries. For refined 6s. 7½d. alongside has been paid for October, 6s. 4d. alongside, January-March, and 6s. 6d. alongside for January alone. Exports for the first 9 months this year have been 20,317,000 qtls. against 18,141,000 qtls. last year. We quote 95 per cent., October-December, 6s. 5½d.; January, 6s. 4½d.; February-March, 6s. 3d., and 96 per cent, October-December, 6s. 7½d.; all ordinary terms sellers. The price of 6s. 5½d., with an all-round freight of 18s. 9d., stands in 8s. 1¼d. per cwt., net cost and freight, without purchasing commission.

Sulphate of Ammonia.—Little doing. Spot gas liquor, 24@25 per cent brings about $3 per 100 lbs., and shipments $2.95.

Phosphates.—A good business is being done in land pebble phosphates, and shipments so far this year are considerably larger than last year. In Florida hard rock shipments the increase is not as large, as competition has been keen in foreign markets. Tennessee rock shows a better domestic demand at steady prices. South Carolina rock is lower in European markets, but as exports are comparatively small the domestic trade prices are not affected.

Exports of Florida high-grade rock from Savannah in October were 27,704 long tons, being the second best month this year. Of this quantity Germany received 16,385 tons, and Holland 6,252 tons, while the balance went to Italy, Austria and Sweden. In the 10 months this year the exports amounted to 154,814 tons, which compares with 134,910 tons in the corresponding period last year, showing an increase of 19,904 tons, or 14.8 per cent in 1902.

Phosphates.	Per ton F. o. b.	United Kingdom or European Ports. Unit.	Long ton.
•Fla. hard rock (78@80%)	$6.50@$7.00	6⅝@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@4¾d.	5.67@ 5.98
‡So. Car. river rock	2.75@ 3.00	.....	.....
Algerian (63@68%)	.....	5½@6¼d.	7.15@ 8.13
Algerian (58@63%)	.....	5@5¾d.	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. 29.

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

There is a fair spot business reported in the leading lines of heavy chemicals, but the market cannot be called active.

Soda ash for tierces, the nearest range may be called about as follows: Leblanc ash, 48 per cent, £5 15s.@£6; 58 per cent, £6 2s. 6d.@ £6 7s. 6d. per ton net cash. Ammonia ash, 48 per cent, £4 5s.@ £4 10s.; 58 per cent, £4 10s.@£4 15s. per ton net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in demand at generally £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda is rather scarce on the spot and firmly held 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 export to the Continent and a few other markets.

Bleaching powder shows a moderate trade passing for export. Hardwood packages are nominally quoted at £6 10s.@£6 12s. 6d. per ton, net cash, with special quotations for certain export markets.

Chlorate of potash prices are nominal at about 2⅞ @3d. per lb., net cash.

Bicarb soda is unchanged and selling at £6 15s. per ton, less 2 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 slightly easier at about £11 18s. 9d.@£12 1s. 3d. per ton, less 2½ per cent, for good gray 24@25 per cent in double bags, f. o. b. here.

Nitrate of soda holders ask a further slight advance, £9 2s. 6d.@£9 5s. per ton, less 2½ per cent, being about nearest range for double bags f. o. b. here.

METAL MARKET.

New York, Nov. 12.

GOLD AND SILVER.

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

Metal	September. 1901.	September. 1902.	Year. 1901.	Year. 1902.
Gold:				
Exports	$163,362	$514,501	$32,680,569	$30,980,791
Imports	11,905,431	3,012,365	35,400,042	22,937,727
Excess.	I. $11,742,069	I. $2,497,864	I. $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 November 12, and for years from January 1:

Period.	Gold.		Silver.		Total Excess, Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week ...	.....	$253,715	$389,600	$79,965 E.	$ 55,920
1902.....	24,759,532	3,514,041	22,732,068	1,040,381 E.	42,939,168
1901.....	33,588,770	4,419,698	27,145,821	3,249,351 E.	53,015,542
1900.....	36,647,103	10,059,314	34,786,193	4,322,426 E.	54,381,740

There were no gold exports this week, while imports were chiefly from France. Silver exports were principally to London, while imports were from Central and South America.

Financial Notes of the Week.

General business continues good, but money scarcity and other causes have started a period of liquidation in the stock markets, which does not promise well for speculation.

The statement of the New York banks, including the 59 banks represented in the Clearing House, for the week ending November 8 gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts..	$785,656,000	$886,995,000	$875,480,600
Deposits	831,091,800	950,419,100	885,882,200
Circulation	30,705,700	31,821,400	43,801,800
Specie	156,256,700	177,339,200	172,204,400
Legal tenders	56,122,300	68,955,500	67,118,500
Total reserve	$212,379,000	$246,294,700	$239,322,900
Legal requirements ..	207,772,950	237,604,775	221,470,550
Balance, surplus ..	$4,606,050	$8,689,925	$17,852,350

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		1902	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ass'd .	$177,339,200	.....	$172,204,400	.....
England ...	175,918,250	.....	167,422,170	.....
France	476,039,440	$219,668,235	506,577,040	$220,987,760
Germany ...	162,750,000	63,290,000	156,655,000	57,940,000
Spain	70,035,000	84,975,000	71,590,000	98,400,000
Neth'l'ds ..	28,778,000	28,840,000	23,454,000	32,156,500
Belgium ...	14,970,000	7,485,000	14,980,000	7,490,000
Italy	79,665,000	9,849,500	81,465,000	10,202,000
Russia	335,070,000	29,405,000	359,995,000	33,435,000

The returns of the Associated Banks of New York are of date November 8, and the others November 6, 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 tendency of silver has been towards a lower level. Sales of Mexican dollars on London market have recently been heavy. This fact, together with lack of demand at times in India, have depressed the price, and no immediate improvement is apparent from the present outlook.

The United States Assay Office in New York reports receipts of 67,000 oz. silver for the week.

Shipments of silver from London to the East for the year up to October 30 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£6,427,910	£5,322,830	D. £1,105,080
China	590,212	162,500	D. 427,712
The Straits	402,821	492,120	I. 89,299
Totals	£7,420,943	£5,977,450	D. £1,443,493

Arrivals for the week, this year, were £159,000 in bar silver from New York, £25,000 from Australia and £5,000 from Chile; total, £189,000. Shipments were £88,100 to Bombay and £11,000 to Calcutta; total, £99,100, all bar silver.

Indian exchange continues steady, the Council bills offered in London being all taken at an average of 15.96d. per rupee. The buying of silver for the East is still light.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	$0.38¼	$0.41½
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. Nov. 8.

(From Our Special Correspondent.)

Joplin Ore Market.—There was another decline in the general run of ore prices during the week, due almost entirely to the shortage in cars, there being a large surplus left in the bins that could not be shipped. The railroads were not able to handle much more than had been bought, and left in the bins the preceding week. The shipment last week was 2,000,000 lbs. below the average for the year, although the usual quantity was mined. The value of the shipment was almost $40,000 below the weekly average. During the week the highest price paid for zinc ore was $38.50. The assay basis for 60 per cent ore was reduced to $34 per ton, although some of the ore shipped was settled for on a basis of $36 per ton, because it had been bought some weeks ago. Lead continued strong throughout the week at $50 per ton. Following is the output of the various camps of the Joplin District for the week ending November 8:

Camp	Zinc. lbs.	Lead. lbs.	Value.
Joplin	2,519,970	305,500	$51,748
Galena-Empire	711,960	117,660	15,830
Carterville	1,409,180	211,230	28,332
Aurora	523,030	14,360	8,610
Spurgeon	275,230	33,330	4,378
Duenweg	348,690	12,680	6,215
Oronogo	218,030	47,100	5,048
Cave Springs	56,440	3,450	1,035
Central City	101,420	11,860	1,717
Carthage	296,970	.....	5,048
Zincite	328,020	.....	5,904
Prosperity	58,070	16,640	1,260
Granby	373,000	14,000	4,625
Carl Junction	122,070	.....	2,197
Alba-Neck	100,630	.....	1,711
Ash Grove	105,460	130,620	4,327
Wentworth	47,420	.....	711
Total	7,595,590	978,520	$148,926
Total 45 weeks	461,357,420	55,807,800	$8,268,407

OTHER METALS.

Daily Prices of Metals in New York.

November	Sterling Exchange	Silver N. Y. Cts.	Silver London, Pence.	Copper Lake Cts per lb	Copper Electro lytic cts. per lb.	Copper London, £ per ton.	Copper Tin, Cts. per lb.	Spelter Lead Cts. per lb.	Spelter N. Y Cts. per lb.	Spelter St. L. Cts. per lb.
				11½	11⅜			4.05		
6	4.86¼	49⅞	23 1/16	@11¾	@11½	51⅞	26⅜	@4.10	5.27½	5.12½
				11½	11⅜			4.05	5.25	5.10
7	4.86¼	49⅞	23 1/16	@11¾	@11½	51⅞	26¼	@4.10	@5.27½	@5.12½
				11½	11¼			4.05	5.25	5.10
8	4.87	50⅛	23 1/16	@11⅝	@11⅜	..	26¼	@4.10	@5.27½	@5.12½
				11½	11¼			4.05		
10	4.87	49⅞	23 1/16	@11⅝	@11⅜	51½	26	@4.10	5.25	5.10
				11½	11¼			4.05		
11	4.87	49⅝	22 15/16	@11⅝	@11⅜	51⅜	26¼	@4.10	5.25	5.10
				11½	11¼			.05		
12	4.87	49⅝	22 15/16	@11⅝	@11⅜	51¼	26	@4.10	5.25	5.10

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

Copper.—The disturbed condition of the securities market has exercised an adverse influence on the trade, and has made buyers very reluctant to enter into new obligations. Under the circumstances transactions, have been few and far between, and prices, although rather nominal, show a further decline. At the close we quote lake 11½@11⅝c.; electrolytic in cakes, wirebars or ingots, 11¼@11⅜c.; cathodes, 11@11⅛c.; casting copper, 11¼@11⅜c.

The foreign market, which closed last Friday at £51 17s. 6d., opened on Monday at £51 10s., and the closing quotations are cabled as £51 5s.@£51 7s. 6d. for spot, and £51 10s.@£51 12s. 6d. for three months prompt.

Refined and manufactured sorts we quote: English tough, £54 15s.@£55 5s.; best selected, £55 5s.@£55 15s.; strong sheets, £67 15s.; India sheets, £66 15s.; yellow metal, 6⅛@6½d.

Exports from Atlantic ports in the week ending November 12 were: Great Britain, 162 tons; Germany, 202; Holland, 425; France, 552; Italy, 50; Austria, 185; Russia, 100; Sweden, 15; Panama, 55; Chile, 28; total, 1,774 tons. Last week Baltimore alone exported 2,444 tons. Imports at New York and Baltimore this week were 175 tons copper from Japan, and 340 tons from Mexico; total, 515 tons.

Imports of copper into Germany, with re-exports of foreign copper, for the 9 months ending September 30, are reported as below, in metric tons:

	1901.	1902.	Changes.
Imports	45,353	58,818	I. 13,465
Re-exports	3,596	3,487	D. 109
Balance	41,757	55,331	I. 13,574

Imports of copper ore for the 9 months were 11,105 tons, against 3,110 tons for the corresponding period last year.

Chilean Copper Market.—Messrs. Jackson Brothers write from Valparaiso, Chile, under date of October 4, that sales include 15,465 quintals bar copper and 700 tons of regulus. No sales of copper ore are reported. Quotations for bar copper are $31.70 Chilean, cash on shore, per quintal; for regulus, 50 per cent, $13.75 Chilean, per quintal.

Tin has been active and in fair demand, but the market has been bare of any special feature. At the close we quote spot at 26c.; November, 25¾@25⅞; December, 25½@25⅝.

The foreign market ruled very firm last week at about £118, but opened considerably lower on Monday at £116 5s; on Tuesday advanced £1, and the closing quotations on Wednesday are cabled as £116 @£116 2s. 6d. for spot, and £114 10s.@£114 12s. 6d. for three months prompt.

Lead is steady and unchanged. The ruling quotations are 3.97½@4.05c., St. Louis, and 4.05@4.10c., New York.

There is a somewhat better demand from Europe, Spanish lead being quoted £10 13s. 9d.@£10 15s., and English lead, 2s. 6d. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull and sells at 4c. for Missouri brands and 4.05c. for argentiferous.

Spanish Lead Market.—Messrs. Barrington & Holt report from Cartegena, Spain, under date of October 25, as follows: The price of silver during the week has been 12.25 reales per ounce. The exchange has gone down by 8 centimos, making it 32.97 pesetas to £1.. The local quotation for pig lead on wharf has been 55.75 reales per quintal, which on above exchange is equal to £9 9s. 6d. per ton of 2,240 lbs. f. o. b. Cartagena. Exports of pig lead have been 919,346 kgs to Marseilles. There were also 1,315 kgs. silver bars shipped to Marseilles.

Spelter.—We have again to report a rather irregular market, and lower prices seem to have been accepted. Consumptive inquiry has fallen off to a moderate extent. The ruling quotations are 5.10c., St. Louis, and 5.25c., New York.

The foreign market is firm, good ordinaries being quoted £19 10s., and specials 5s. higher.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is a trifle easier, the latest sales being on a basis of 5.10c., East St. Louis.

Silesian Spelter Market.—Herr Paul Speier writes from Breslau, under date of October 28, that while some heaviness resulted from a falling off in exports to Great Britain, there is more inquiry reported, and prices are somewhat firmer. Quotations made are 19 @19.50 marks per 50 kgs., f. o. b. cars Breslau. This is equal to an average of 4.15c. per lb. Exports of spelter for the 9 months to September 30 included 26,379 tons to Great Britain, 11,669 tons to Austria-Hungary, 6,485 tons to Russia, 2,428 tons to France, 2,281 tons to Holland, 1,801 tons to Italy, 1,284 tons to Sweden and 832 tons to Japan.

Spanish Zinc Ore Market.—Messrs. Barrington & Holt write from Cartagena, Spain, under date of October 25, reporting shipments from that port of 500 tons of blende to Antwerp.

Antimony is dull and unchanged at last week's quotations, viz.: 9@9½c. for Cookson's; 7⅜@7½c. for Hallett's, and 7@7¼c. for Hungarian, Japanese, Italian and U. S. Star.

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 quoted from second hands.

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	4.13
February	24.07	26.68	4.075	4.350	4.15	4.01
March	26.32	26.03	4.075	4.350	4.28	3.91
April	27.77	25.93	4.075	4.350	4.37	3.98
May	29.85	27.12	4.075	4.350	4.47	4.04
June	29.36	28.60	4.075	4.350	4.96	3.99
July	28.38	27.85	4.075	4.350	5.27	3.95
August	28.23	26.78	4.075	4.350	5.44	3.90
September	26.60	25.31	4.075	4.350	5.49	4.06
October	26.07	26.62	4.075	4.350	5.38	4.23
November	....	26.67	....	4.350	...	4.29
December	....	24.86	....	4.153	...	4.31
Year	....	26.54	....	4.334	...	4.09

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	11.449	16.25	11.722	16.60	52.18	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. N. 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	23.40	50.57	26.62	57.59	29.58	63.68
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.
†Amalgamated	Nov. 24	.50	$769,439	$19,656,687
*Bartolome, Mex.	Nov. 30	.60	1,200	62,283
Calumet & Hecla	Dec. 10	5.00	500,000	79,850,000
*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	.....
*Daly West, Utah	Nov. 15	.60	108,000	2,151,000
*Empire State, Ida.	Nov. 15	.05	25,277	1,536,385
*Four Oil, Cal.	Nov. 15	.01	2,087	25,044
*Gold Coin, Colo.	Nov. 25	.01	10,000	1,210,000
*Golden Cycle, Colo.	Nov. 15	.00¾	11,250	56,250
*Guadalupe, Mex.	Nov. 25	2.00	20,000	3,535,350
*Helena, Ore.	Nov. 25	.01½	19,500	267,500
*Homestake, S. D.	Nov. 25	.25	54,600	11,657,550
*Home Oil, Cal.	Nov. 15	.07½	7,500	442,500
§Lehigh Coal & Nav.	Nov. 28	1.00	286,933	20,095,120
*N. Y. & Hond., Rosario.	Nov. 15	.10	15,000	1,835,000
Ontario, Utah	Dec. 20	.30	45,000	14,917,000
*Pacific Coast Borax	Nov. 30	1.00	19,000	1,198,500
*Peerless Oil, Cal.	Dec. 1	.08	7,360	46,920
*Penoles, Mex.	Nov. 30	20.00	50,000	1,928,289
*Rambler-Cariboo, B. C.	Nov. 30	.01	12,500	237,500
*Sta. Gertrudis, Mex.	Nov. 25	.40	11,500	.....
†Standard Con., Cal.	Nov. 21	.10	17,839	4,106,814
*United, g., Colo.	Nov. 25	.01	40,001	239,841
†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
Best & Belcher	Nev.	..	Nov. 28	Dec. 19	.10
Bullion	Nev.	..	Nov. 29	Dec. 19	.03
California	Cal.	..	Nov. 10	.....	.00½
California	Utah	..	Nov. 22	Dec. 20	.04
Chollar	Nev.	60	Nov. 5	Nov. 25	.05
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
Fifteen-Three Oil	Cal.	..	Nov. 20	.....	.02
Fremont Con.	Cal.	..	Nov. 17	.....	.10
Grizzly	Cal.	..	Nov. 24	.....	.10
Homestake	Utah	12	Nov. 21	Dec. 9	.01
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
Northern Light	Utah	8	Nov. 20	Dec. 11	.02
Olcorose	Cal.	..	Nov. 15	.....	.03
Omaha Con.	Cal.	..	Dec. 4	.....	.50
Overman	Nev.	..	Nov. 10	Dec. 2	.10
Potosi	Nev.	64	Nov. 10	Dec. 1	.05
Savage	Nev.	..	Dec. 1	Dec. 22	.05
South Eureka	Cal.	..	Nov. 17	.....	.03
Ultimo	Cal.	..	Nov. 15	.....	.10
Union Con.	Nev.	65	Nov. 12	Dec. 4	.10
Wellington Oil	Cal.	..	Nov. 27	.....	.02
Yellow Jacket	Nev.	12	Oct. 21	Nov. 26	.10
Ybarra	Cal.	..	Nov. 17	.....	.10

STOCK QUOTATIONS.

NEW YORK.

Company and Location.	par val	Nov. 5. H.	Nov. 5. L.	Nov. 6. H.	Nov. 6. L.	Nov. 7. H.	Nov. 7. L.	Nov. 8. H	Nov. 8. L.	Nov. 11. H.	Nov. 11. L.	Nov. 12. H.	Nov. 12. L.	Sales
Acacia Colo.	$ 1													
Amalgamated c., Mont	100	65.50	63.00	63.88	62.88	63.50	62.88	62.63	61.50	61.75	58.50	60.63	55.50	125785
*Anaconda c., Mont.	25	96.00	95.88	96.13	92.00	94.75	93.00	92.00	88.00	88.50	83.00	.88	.85	8,210
Anaconda, g., Colo.	5													
Belcher, Nev.	3	.14												500
Best & Belcher, Nev.	3	.17										.35		700
Brunswick, Cal.	1					.05						.05		1,900
Comstock T., s., Nev.	2					.05						.05		3,900
Comst T Bonds	100	.05												1,000
Con. Cal. & Va., g.s. Nev	2½	.87	.86	.90		.91	.86			.90		.90	.89	1,250
Creede & C. C., Colo.	1	.03												1,000
Cripple Creek c., Colo.	1			.07										1,000
Dunkin, Colo	5			.09		.09								700
Elkton, g., Colo.	1					.33				.32		.33		1,000
Gold Dollar, Colo.	1	.05½								.06				3,000
Greene Con., c., Mex.	10	24.88	24.50	24.25	24.13	24.00	22.88	23.50	21.75	23.75	23.00	23.35	23.00	10,800
Hale & Norcross, Nev.	3													
Isabella, g., Colo.	1					.32						.30		
Mexican, Nev.	3					.80						.85		1,800
MollieGibson, g.s. Colo	5	.09½	.09	.09		.09				.09				400
Moon-Anchor, Colo.	5	.10		.08										2,500
Ontario, s. l., Utah	100											8.00		200
Ophir, s., Nev	3	.95				1.00				1.05		1.00		800
Pharmacist, Colo.	1			.05½		.05								2,500
Phœnix, Ariz.	1													
Portland, Colo	10													100
Potosi, Nev.	3			.12								.17		500
Quicksilver, Cal.	100													
Quicksilver pf., Cal.	100													
Sierra Nevada, Nev.	3	.20												100
Standard Con.	10													
Tenn. c., Tenn	25	16.50		17.00	16.25	16.63		16.25				16.25	15.50	1,100
Union Con., Nev.	2½			2.88		2.88	2.75	2.75		2.75				700
Union, c., N. C.	10													
Virginia Con., Colo.	1					.02				.02				3,000
White Knob, g. s., Ida	100	14.00	13.00	13.00		13.50	13.00			12.00		12.50		25

*Per cent.

Coal, Iron and Industrial Stocks.

Am. Agr. Chem., U.S.	100	.25½	.20	.25½	.20	.25½	.25	.25½		.22		.25½	.22	
Am. Agr. Chem. pf, U.S.	100	.83	.79½	.83	.79	.83	.79	.90	.79	.82½				
Am. Sm. & Ref., U.S.	100	.46	.44¾	.45	.44½	.45	.44¾	.44	.43½	.43½	.42⅛	.43¼	.41½	18,500
Am. Sm. & Ref. pf, U.S.	100			.95	.94⅜	.95		.94½		.93⅞	.91	.94	.93	2,800
Col. Fuel & I., Colo.	100	.88	.86	.86⅞	.86¼	.89½	.86	.85¼	.82½	.81	.77	.80¼	.78	47,160
Col. & H. C. & I., Colo.	100	.21½		.21½	.21	.21⅞		.20⅛		.20⅛	.19⅛	.19⅜	.19	2,400
Crucible Steel, U. S.	100	.21½	.21⅜	.21		.21		.20⅝	.20	.20⅛	.19½	.20	.19	7,337
Crucible Steel, pf, U.S.	100	.86	.85½	.85⅝	.85⅜	.85⅝	.85½	.85½	.85¼	.85⅜	.85⅜	.85	.84¼	2,979
Int'l S. Pump, U.S.	100	.50½	.50¼	.51	.50¼	.51	.50¼	.51	.50¼	.50½		.50¼		1,325
Int'l S. Pump pf, U.S.	100	.90		.93	.88	.93	.88	.93	.88					200
Mong. R. Coal, Pa.	100	.11½		.11⅜	.11	.11¼				.11¼	.11	.10¾	.09¼	2,314
Mong. R. Coal pf, Pa.	100	.40¾		.40½		.40⅜	.40⅛	.40½	.40⅜	.40¼	.40	.40	.39½	1,322
National Lead, U.S.	100	.28	.27	.27¼	.27	.27¾	.27½	.27¼	.26½	.26	.25	.26¼	.25⅛	7,850
National Lead pf, U.S.	100	.92¾		.91⅜		.91⅜	.91½	.90½		.90¼	.90	.93		1,500
Phila Nat. Gas	100			.47⅝						.47	.46¾	.46⅝		500
Phila Nat. Gas, pf	100			.50						.49		.49		354
Pittsburg Coal, Pa.	100	.30¼	.30½	.30⅜	.29¾	.30	.29⅝	.29¼	.28¾	.28½	.27⅛	.28⅝	.27⅜	4,932
Pittsburg Coal pf, Pa.	100	.88¾	.88⅝	.88¾	.88½	.88½	.88	.88⅝	.88⅛	.88⅜	.88⅛	.88½	.88¼	1,770
Republic I. & S., U.S.	100	.22	.20¾	.20¾	.20⅛	.21	.20⅛	.20⅛	.19½	.19⅝	.18¾	.20⅛	.18¼	18,010
Republic I. & S., pf, U.S.	100	.78	.76⅛	.77		.77	.76¼	.77	.76	.75⅜	.75	.75⅛	.75	6,176
Sloss-Shef S. & I., Ala.	100	.65⅛		.66	.64½	.66⅛	.64⅛	.64¾		.64	.62	.62⅝	.61⅜	1,050
Sloss-Shef S. & I. pf, Ala.	100	.94	.91⅛			.94	.92			.91	.90⅛			700
Standard Oil, U.S.	100	682		679⅜	675	680	679¼	680		677	670	672	671	302
Tenn. C. I. & R. R., Ala.	100	.65⅜	.63⅛	.64	.63¼	.63⅞	.63½	.63¼	.60½	.60⅛	.58¾	.61½	.55¼	22,300
U. S. Cast I. Pipe, U.S.	100	.15⅜	.15	.15⅜	.14¾	.15				.14⅜	.14	.14	.13⅛	3,300
U.S.C. I. Pipe, pf, U.S.	100	.55	.54½	.55	.54⅜	.55		.55	.54	.53	.51	.52	.51	2,130
U. S. Red. & Ref., Colo.	100													
U.S. Red. & Ref. pf, Colo	100													
U.S. Steel Corp., U.S.	100	.40	.39	.39¼	.38⅞	.39⅛	.39	.39	.37⅝	.37⅝	.36¼	.37¾	.36⅛	34,760
U.S. Steel Corp. pf, U.S.	100	.88⅛	.86⅞	.87¼	.86⅞	.87⅜	.87	.86	.84⅞	.84¾	.83	.85	.83⅛	155635
Va.-Car Chem., U.S.	100	.69¾	.66	.66	.65¾	.66	.65½	.65½	.65	.63⅛	.62¾	.64¾	.61⅛	8,540
Va.-Car Chem. pf, U.S.	100	128								125	124½			400
W'house Elect., Pa.	50	212		209¾						202		206	198	325
W'house Elect., pf, Pa.	50											205	201	300

Total sales, 200,417 shares.

BOSTON, MASS.*

Name of Company.	par val	Shares listed.	Nov. 5 H.	Nov. 5 L.	Nov. 6 H.	Nov. 6 L.	Nov. 7. H.	Nov. 7. L.	Nov. 8. H.	Nov. 8. L.	Nov. 10. H.	Nov. 10. L.	Nov. 11. H.	Nov. 11. L.	Sales
Adventure Con., c.	$25	100,000	20.00	19.00	19.00	18.50	18.75	.....	.....	.....	18.50	17.50	17.25	16.50	1,000
Allouez	25	80,000	.....	.....	2.88	2.63	.....	.....	2.50	.....	.....	.....	2.50	2.25	595
Amalgamated, c.	100	1,538,879	65.00	63.13	63.88	62.75	64.00	63.00	62.50	.....	62.00	58.75	60.50	55.50	21,411
Am. Gold Dreg.	5	90,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Am. Z. L. & Sm.	25	60,000	.....	.....	.....	.....	10.50	.....	.....	.....	.....	.....	.....	.....	250
Anaconda, c.	25	1,200,000	.....	.....	.....	.....	.....	.....	23.50	.....	.....	.....	.....	.....	21
Arcadian, c.	25	150,000	4.75	4.50	4.75	.....	.....	.....	4.75	4.50	4.50	.....	4.25	4.00	625
Arnold.	25	60,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Ashbed.	25	40,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Atlantic, c.	25	40,000	22.00	20.00	.....	.....	.....	.....	.....	.....	.....	.....	8.50	8.00	325
Atlantic (new)			.....	.....	9.00	8.75	.....	.....	.....	.....	27.00	26.00	.....	.....	120
Bingham Con., g. s.	50	150,000	28.88	28.00	28.00	.....	28.00	27.50	.....	.....	.70	.....	27.00	25.50	1,020
Bonanza	10	300,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.65	.....	575
British Columbia	5	250,000	.....	.....	.....	.....	.....	.....	.....	.....	5.02	5.01	.....	.....	
Cal. & Hecla, c.	25	100,000	5.01	.....	5.01	.....	5.08	5.01	5.01	.....	17.75	17.00	4.97	4.95	165
Centennial, c.	25	90,000	19.13	18.25	19.00	18.25	18.63	18.50	18.00	.....	.....	.....	17.00	15.13	4,055
Central Oil	25	60,550	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Cochiti	10	182,250	.....	.....	.....	.....	.....	.....	.....	.....	1.75	.....	.....	.....	
Con. Mercur, g.	5	1,000,000	1.93	.....	1.93	1.75	1.88	1.75	1.88	.....	.....	.....	1.88	1.75	4,830
Continental Zinc	25	22,000	.....	.....	.....	.....	16.50	.....	.....	.....	60.13	57.25	.....	.....	28
Copper Range Con.	100	285,000	64.63	61.63	63.00	61.50	62.75	62.00	62.25	60.00	59.00	.....	58.75	53.75	18,680
Daly-West., g. s.	20	180,000	.....	.....	.....	.....	.....	.....	.....	.....	129	128	.....	.....	10
Dominion Coal.	100	150,000	.....	.....	131	.....	.....	.....	.....	.....	.....	.....	126¾	125	710
Dominion Coal, pf.	100	30,000	.....	.....	136¾	.....	.....	.....	.....	.....	57.75	56.00	117	.....	150
Dominion I & S.	100	100,000	61.50	59.00	59.50	58.00	58.88	58.00	57.75	56.75	.....	.....	58.50	54.50	11,428
Elm River.	12	100,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,133
Franklin, c.	25	100,000	.....	.....	.....	.....	.....	.....	9.25	9.00	3.50	.....	.....	.....	35
Guanajuato Con.	5	385,000	3.93	3.75	.....	.....	3.88	3.50	3.88	3.25	13.25	13.00	3.75	3.63	2,820
Isle Royale Con., c.	25	150,000	.....	.....	.....	.....	13.25	.....	.....	.....	9.00	8.50	13.75	13.00	435
Mass Con., c.	25	100,000	14.50	14.00	15.00	14.00	15.00	14.00	.....	.....	.....	.....	14.50	14.00	3,687
Mayflower, c.	25	100,000	1.50	.....	.....	.....	.....	.....	.....	.....	9.00	8.50	1.50	.....	283
Michigan, c.	25	100,000	9.00	.....	9.00	.....	9.00	.....	.....	.....	43.50	.....	8.00	7.50	985
Mohawk, c.	25	100,000	45.50	.....	45.50	.....	45.25	45.00	45.00	.....	.....	.....	43.00	39.50	1,230
Mont. Coal & Coke	25	200,000	5.25	.....	.....	.....	5.00	.....	.....	.....	2.63	2.50	.....	.....	200
Mont'l & Boston, c.	5	570,000	2.75	2.63	2.88	.....	2.88	2.75	2.63	.....	.....	.....	2.50	.....	3,030
New Idria	5	100,000	.....	.....	.....	.....	8.50	.....	.....	.....	.....	.....	.....	.....	90
North Star.	10	250,000	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.25	1.13	170
Old Colony, c.	25	100,000	.....	.....	.....	.....	.....	.....	.....	.....	1.25	.....	15.13	.....	1,085
Old Dominion, c.	25	150,000	16.00	.....	.....	.....	16.00	.....	.....	.....	16.00	15.50	51.50	49.00	2,353
Osceola, c.	25	96,150	56.00	54.50	55.00	.....	55.00	.....	.....	.....	52.00	51.00	25.00	.....	295
Parrot, s. c.	10*	229,850	.....	.....	25.00	.....	.....	.....	.....	.....	25.00	.....	5.00	4.50	1,015
Phoenix Con., c.	25	100,000	.....	.....	5.00	.....	.....	.....	4.75	.....	4.50	.....	.....	.....	35
Quincy, c.	25	100,000	.....	.....	.....	.....	.....	.....	1.20	.....	1.20	.....	2.00	.....	360
Rhode Island, c.	25	100,000	.....	.....	2.00	.....	2.00	.....	.....	.....	2.00	.....	1.75	1.50	340
Santa Fe, g. c.	10	250,000	.....	.....	1.75	.....	.....	.....	.....	.....	1.75	1.63	8.50	.....	660
Shannon, c.	10	186,296	.....	.....	9.00	.....	9.00	.....	.....	.....	.....	.....	1.50	.....	564
Tamarack, c.	25	60,000	.....	.....	.....	.....	1.55	.....	.....	.....	1.55	1.50	.....	.....	200
Tecumseh.	25	80,000	.....	.....	.....	.....	.....	.....	.....	.....	1.00	.....	10.50	10.00	1,680
Trinity, c.	25	100,000	10.50	.....	10.50	.....	10.25	.....	10.50	10.00	10.38	10.00	31.25	.....	1,710
United Copper	100	450,000	.....	.....	33.00	32.25	32.88	.....	32.38	32.00	31.75	31.63	26.50	19.00	4,700
United States, g.	25	250,000	21.25	20.75	.....	.....	21.00	20.50	20.13	20.00	20.00	19.75	14.13	13.25	3,600
U. S. Coal & Oil	25	240,000	14.75	14.38	.....	.....	14.25	14.00	14.00	13.75	14.25	13.75	21.00	20.50	1,561
Utah Con., g.	5	300,000	21.00	20.75	21.50	21.25	.....	.....	21.00	20.50	21.00	20.50	5.00	.....	610
Victoria, c.	25	100,000	6.50	.....	6.38	.....	6.38	5.50	5.50	.....	.....	.....	3.26	3.06	275
Winona, c.	25	100,000	.....	.....	4.00	.....	.....	.....	.....	.....	3.50	.....	.....	.....	315
Wolverine c.	25	60,000	59.75	58.00	59.88	.....	59.50	.....	.....	.....	60.00	59.50	.75	.....	300

* Total sales, 116,689 shares.

PHILADELPHIA, PA.§

Name and Location of Company.	par val	Nov. 5. H.	Nov. 5. L.	Nov. 6. H.	Nov. 6. L.	Nov. 7. H.	Nov. 7. L.	Nov. 8. H.	Nov. 8. L.	Nov. 10. H.	Nov. 10. L.	Nov. 11. H.	Nov. 11. L.	Sales
Am. Alkali, Mich.	$50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Am. Cement.	10	9.06	.....	9.06	9.00	9.06	9.00	9.00	.....	.....	.....	.....	.....	1,888
Cambria Iron, Pa.	50	.....	.....	47.88	.....	.....	.....	.....	.....	47.50	.....	.....	.....	50
Cambria Steel, Pa.	50	28.00	27.63	27.75	.....	28.25	27.75	27.75	27.38	27.25	26.88	27.38	26.75	11,788
Penn. Steel, pfd.	100	101	.....	101	.....	101	.....	.....	.....	100	.....	100	.....	272
Susq. I. & S., Pa.	5	2.63	.....	2.75	.....	2.75	.....	2.75	.....	2.75	2.63	2.68	2.63	1,335
United Gas I., Pa.	50	114¾	113	113⅝	113	113¾	113¾	113¾	112½	112¾	111⅝	112½	111	5,130
Warwick I. & Steel.	10	5.75	.....	5.50	.....	5.50	.....	5.50	.....	5.50	.....	.....	.....	307

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 20,771 shares.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Name of Company.	par val	Nov. 3. H.	Nov. 3. L.	Nov. 4. H.	Nov. 4. L.	Nov. 5. H.	Nov. 5. L.	Nov. 6. H.	Nov. 6. L.	Nov. 7. H.	Nov. 7. L.	Nov. 8. H.	Nov. 8. L.	Sales
Acacia	$1	.09	.08⅛	.....	.....	.09⅛	.08⅝	.09	.08¼	.09	.08¾	.09	.08⅝	.....
Alamo	1	.04½	.03¾	.....	.....	.04	.03¼	.04	.03¾	.04⅛	.03¾	.....	.03¾	5,000
Am. Con	1	.....	.02⅛	.....	.....	.03	.02	.03	.02	.02⅛	.02	.02⅛	.02	.....
Anaconda	1	.20	.15	.....	.....	.20	.15	.20	.....	.20	.15	.20	.15	.....
Ben Hur	1	.03	.02⅛	.....	.....	.03	.02⅛	.03⅛	.03	.03	.02⅜	.03	.02⅜	.....
Black Bell	1	.07⅛	.....	.....	.....	.07⅛	.....	.07½	.....	.07⅛	.05	.07⅛	.05	.....
Blue Bell	1	.....	.06	.....	.....	.06	.....	.07	.05	.....	.04⅛	.07	.06¼	.....
C. k. & N	1	.09	.08⅛	.....	.....	.09⅜	.09⅛	.09⅝	.09⅛	.10	.08¼	.10	.09¾	40,060
C. C. Con	1	.....	.05¾	.....	.....	.06½	.06	.06⅛	.06	.06½	.06	.07	.06	.....
Dante	1	.03⅛	.03	.....	.....	.03⅛	.03	.03⅝	.03	.03⅜	.03	.03⅜	.03	.....
Dr. Jack Pot	1	.12⅜	.12⅛	.....	.....	.12¾	.12⅜	.12⅛	.12⅜	.12⅞	.12¾	.12⅛	.12	5,000
Elkton Con	1	.35⅛	.35⅛	.....	.....	.35¼	.35	.35⅛	.35	.35⅛	.34¾	.35⅜	.35	11,250
El Paso	1	.71	.70	.....	.....	.70⅝	.70¾	.70⅝	.70	.70¾	.70⅜	.70	.69	16,500
Fanny Rawlings	1	.04⅞	.04	.....	.....	.05	.04	.05	.04	.05	.04	.....	.04	.....
Findley	1	.10	.08	.....	.....	.10	.08¼	.10	.08¼	.10	.08¼	.10	.08¼	.....
Gold Bond	1	.....	.03⅞	.....	.....	.04⅛	.03⅝	.04	.03¼	.04	.03⅛	.....	.....	2,000
Gold Dollar Con	1	.04¾	.04⅝	.....	.....	.04⅞	.04¾	.05	.04⅝	.05¼	.05⅛	.05⅛	.05	19,000
Golden Cycle	1	.63	.59	.....	.....	.59¼	.....	.62	.59	.59⅛	.....	.62	.59	1,000
Golden Fleece	1	.....	.....	.....	.....	.....	.10	.09	.....	.10	.09	.25	.....	.....
Gold Sov'n	1	.....	.....	.....	.....	.....	.02⅛	.03	.02	.....	.02⅛	.02⅛	.02¼	3,000
Hart	1	.....	.....	.....	.....	.04¼	.02⅛	.04	.03	.04⅛	.....	.04¼	.....	.....
Iron Clad	1	.....	.....	.....	.....	.03	.02	.....	.....	.....	.02	.....	.....	.....
Isabella	1	.34⅛	.34	.....	.....	.34¼	.34	.34¾	.34	.33¾	.33	.34	.33	6,200
Jack Pot	1	.12⅛	.12	.....	.....	.12⅛	.12	.12⅝	.11⅜	.12⅝	.12	.12⅛	.12	.....
Last Dollar	1	.....	.....	.....	.....	.....	.....	.....	.....	.65	.....	.65	.....	.....
Lexington	1	.05¼	.05	.....	.....	.05⅜	.05	.05¼	.05	.05⅜	.05	.05¾	.05	2,000
Little Puck	1	.04⅛	.04¼	.....	.....	.04¾	.04⅜	.04¾	.04⅜	.04⅛	.04⅜	.04⅜	.04⅜	2,000
Mol. Gibson	1	.08	.06⅜	.....	.....	.08	.07¼	.08	.07¼	.08	.07¼	.08	.07¼	5,000
Moon Anchor	1	.08	.07⅛	.....	.....	.....	.07⅛	.06	.05⅞	.08	.07⅜	.10	.06	1,400
Morning Star	1	.05	.....	.....	.....	.04⅞	.04⅝	.05	.04¾	.04⅞	.04¾	.04⅞	.04⅛	10,000
National	1	.01½	.01⅜	.....	.....	.01⅝	.....	.01⅛	.....	.01⅛	.....	.....	.....	5,000
Nellie V	1	.....	.01	.....	.....	.01	.01¼	.01	.01¾	.01⅛	.01⅛	.01⅛	.....	10,000
New Haven	1	.03	.02⅞	.....	.....	.03½	.02⅞	.03¼	.02⅞	.03¼	.02	.03	.02⅝	3,000
Pappoose	1	.....	.....	.....	.....	.02	.01½	.02	.01¼	.02	.....	.....	.....	.....
Pharmacist	1	.06	.05¾	.....	.....	.06	.05⅞	.06	.05¾	.06	.05¼	.06	.05¾	15,600
Pinnacle	1	.05¼	.04¼	.....	.....	.05⅛	.04⅝	.05⅛	.04⅞	.05⅛	.04⅛	.05⅝	.04	.....
Pointer	1	.02⅛	.02	.....	.....	.02⅝	.02	.02¼	.02⅛	.02⅝	.02	.02¼	.01¼	3,000
Portland	1	1.97	1.87	.....	.....	2.00	1.86	1.93	1.86	2.00	1.86	2.00	1.85	3,000
Prince Albert	1	.....	.....	.....	.....	.03⅛	.02⅞	.03	.02⅞	.03⅛	.02⅛	.03⅛	.02⅜	4,000
Republic	1	.01	.....	.....	.....	.01	.....	.01⅞	.01⅜	.02¼	.01⅜	.01	.....	.....
Rose Maud	1	.03⅛	.03	.....	.....	.03⅛	.....	.....	.....	.03⅛	.02⅝	.03⅛	.02⅝	.....
Sunset Eclipse	1	.02⅞	.02⅜	.....	.....	.02⅞	.02⅝	.02⅞	.02⅛	.....	.02⅛	.02⅞	.02½	2,000
Uncle Sam	1	.02	.01½	.....	.....	.02	.01⅝	.02	.01	.02	.01⅝	.02	.....	.....
Vindicator Con	1	1.06	1.00	.....	.....	1.06	1.00	1.06	1.00	1.05	1.00	1.05	1.00	500
Work	1	.70⅛	.07¼	.....	.....	.07⅜	.07⅛	.07⅜	.07⅛	.07⅜	.07¼	.07⅜	.07½	1,500

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 161,350 shares.

COLORADO SPRINGS (*By Telegraph.*)

Name of Company.	par val	Nov. 5. H.	Nov. 5. L.	Nov. 6. H.	Nov. 6. L.	Nov. 7. H.	Nov. 7. L.	Nov. 8 H.	Nov. 8 L.	Nov. 9. H.	Nov. 9. L.	Nov. 10. H.	Nov. 10. L.
Acacia	$1	.09½	.08⅝	.09	.08¼	.09	.08¾	.09	.08⅝	.09	.08⅝	.09	.08¾
Alamo	1	.04⅜	.03¾	.04⅛	.03¾	.04	.03¾	.04	.03¾	.04	.03¾	.04	.03¾
Anaconda	1	.20	.15	.20	.15	.20	.....	.15	.....	.20	.15	.20	.15
Cripple Creek Con	1	.06¾	.06	.07	.05	.07	.04½	.07	.06	.06¼	.06¼	.06¾	.06⅜
Doctor Jack Pot	1	.12⅜	.12⅛	.09⅞	.09⅝	.10	.09⅝	.12⅜	.12½	.13	.12½	.12⅝	.12⅛
Elkton, Con	1	.35¼	.35	.35½	.35	.35¼	.35⅛	.35⅜	.35	.35⅝	.35	.35¾	.35
El Paso	1	.70¾	.70½	.70⅝	.70⅜	.70¾	.70⅛	.70	.69¾	.69¾	.69¼	.71	.69½
Fanny Rawlings	1	.05	.04	.05	.04	.05	.04	.05	.04	.05	.04	.05	.04
Gold Dollar Con	1	.04⅞	.04¾	.05	.04⅝	.05¼	.05⅛	.05⅛	.05	.05	.04¾	.05	.04¾
Golden Fleece	1	.15	.10	.15	.09	.20	.09	.25	.10	.20	.10	.25	.10
Isabella	1	.34¼	.34	.34¾	.34	.33¾	.33	.34	.33	.32½	.32½	.32¾	.32½
Jack Pot	1	.12⅛	.12	.12⅜	.12	.12½	.12	.12⅛	.12	.12½	.12	.12⅜	.12
Last Dollar	1	.65	.50	.65	.50	.65	.50	.65	.50	.65	.50	.65	.50
Mollie Gibson	1	.08	.07¼	.08	.07¼	.08	.07¼	.08	.07½	.07½	.07	.07¼	.06¾
Moon Anchor	1	.08	.07½	.08⅛	.07⅜	.08⅜	.07½	.10	.06	.08½	.07	.09	.07
Pharmacist	1	.06	.05⅝	.06	.05¾	.06	.05⅞	.05⅞	.05¾	.05⅞	.05	.05⅞	.05⅝
Portland	1	2.00	1.86	1.95	1.86	2.00	1.86	2.00	1.85	2.00	1.86	1.95	1.90
Work	1	.07⅜	.07⅛	.07⅜	.07½	.07¼	.07½	.07¾	.07½	.07¼	.07	.07¼	.06¾

PARIS. Oct. 23

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	1,739.00	1,748.00
" " Firminy	"	"	3,000,000	500	200.00	2,590.00	2,600.00
" " Huta-Bank	Russia	Iron and Steel	.....	500	.....	3,575.00	3,700.00
" " la Marine	France	Steel mfrs	20,000,000	500	65.00	1,200.00	1,202.50
Anzin	"	Coal	.....	.....	320.00	5,325.00	5,400.00
Boleo	Lower Cal	Copper	.....	500	176.00	1,151.00	1,151.00
Briansk	Russia	Coal and Iron	.....	500	.....	283.00	283.00
Champ d'Or	S. Africa	Gold	3,375,000	25	3.75	29.00	29.00
Courrieres	France	Coal	600,000	300	90.00	2,540.00	2,550.00
Dombrowa	Russia	"	.....	500	75.00	980.00	980.00
Dynamite Centrale	France	Explosives	.....	500	19.00	610.00	582.00
Escombrera-Bleyberg	Spain	Lead	.....	500	50.00	711.00	715.00
Fraser River	Brit. Col'mb	Gold	250,000	25	.....	6.50	6.50
Huanchaca	Bolivia	Silver	40,000,000	125	5.00	103.00	103.00
Laurium	Greece	Zinc and Lead	16,300,000	500	25.00	336.00	335.00
Malfidano	Italy	Zinc	12,500,000	500	12.50	475.00	457.00
Metaux, Cie. Fran. de	France	Metal dealers	25,000,000	500	22.50	466.00	470.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	35.00	840.00	845.00
Napthe Baku	Russia	Petroleum	.....	.....	.....	362.50	350.50
Napthe Nobel	"	"	.....	.....	.....	475.00	475.00
" " parts	"	"	.....	.....	.....	9,200.00	9,250.00
Nickel	N. Caled'nia	Nickel	10,000,000	250	20.00	442.00	442.50
Penarroya	Spain	Coal, etc	.....	500	55.00	965.00	970.00
Rebecca	Colo'do, U. S.	Gold	5,000,000	25	.....	1.00	1.00
Salines de l'Est	France	Salt	.....	500	6.00	310.00	302.00
Salines du Midi	"	"	.....	500	40.00	894.00	897.50
Vieille Montagne	Belgium	Zinc	9,000,000	30	30.00	595.00	600.00

ST. LOUIS, MO.* Nov. 8.

Name.	Shares.	Par Val.	Bid.	Ask.
Am.-Nettie, Colo	300,000	$10	$0.70	$0.80
Catherine Lead, Mo.	50,000	10	1.50	3.00
Central Coal & C.	18,750	100	67.50	67.75
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	21.00	22.50
Doe Run Lead Co.	10,000	100	130.00	139.00
Granite Bimet, Mt.	1,000,000	10	1.27	1.42
St. Joe Lead, Mo.	300,000	10	21.00	22.00

*From our Special Correspondent.

TORONTO, ONT. Nov. 10.

Name of Company.	par val	High.	Low.	Sales.
Center Star	$1	.37½	.34	1,000
Fairview	1	.07	.04	.....
Lone Pine	1	.05½	.03½	.....
Mt. Lion	1	.18	.12	.....
North Star	1	.19	.15½	.....
Payne	1	.16	.12	.....
Rambler-Cariboo	1	.55	.40	.....
Republic	1	.08	.07	2,500
War Eagle Con	1	.20	.17	1,389
White Bear	1	.03½	.02¾	5,350
Winnipeg	1	.04	.....	.....
Develop. Co				
Can. G. F. S.	1	.04¼	.03	.....

Total sales, 10,230 shares.

LONDON. Oct. 29.

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	4 18 9	5 1 3
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 12 6	7 17 6
Arizona, Cum., pfd	316,530	1 0 0	£7	Sept., 1902	131 0 0	136 0 0
Camp Bird, g., Colo	1,000,000	1 0 0	0 7½	Sept., 1902	1 3 6	1 3 9
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	Oct., 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 5 0	1 7 6
Frontino & Bolivia, g., Colombia	140,000	1 0 0	3 0	July, 1901	13 9	16 3
Hall Mg. & Sm., c. s., British Col	325,000	1 0 0	1 0	May, 1898	1 3	1 5
Le Roi, g., British Col	1,000,000	5 0 0	5 0	Nov., 1899	1 7 6	1 10 0
Le Roi No. 2, g., British Col	120,000	5 0 0	5 0	May, 1902	1 2 6	1 5 0
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	6 6	7 6
St. John del Rey., g., Brazil	600,000	1 0 0	6	June, 1902	16 6	17 6
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	2 6	7 6
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 7 6	3 12 6
Rio Tinto, c., Spain	1,625,000	5 0 0	22 6	Nov., 1902	42 17 6	43 2 6
Rio Tinto, pref., Spain	1,625,000	5 0 0	2 6	Nov., 1902	6 0 0	6 5 0
Tharsis, c., Spain	1,250,000	2 0 0	8 0	May, 1902	4 17 6	5 2 6
Australia and New Zealand:						
Assoc. Gold Mines, W Australia	500,000	1 0 0	1 6	Jan., 1900	1 12 6	1 15 0
Broken Hill Pr'p., s., N. S. Wales	384,000	8 0	1 0	Aug., 1902	1 8 9	1 10 0
Great Bo'd'r Pr'p., W. Australia	175,000	2 0	6	Oct., 1902	18 0	18 6
Hannan's Brownhill, g., W. Australia	155,000	1 0 0	5 0	Aug., 1901	2 5 0	2 7 6
Ivanhoe Gold Corp. W. Australia	1,000,000	5 0 0	4 0	Oct., 1902	7 3 6	7 6 3
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 6 3	2 8 9
Mt. Lyell M. & R. I., c., Tasmania	825,000	3 0 0	1 0	Oct., 1902	2 6 3	2 8 9
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 3 9	5 6 3
Indian:						
Champion Reef, g., Colar Fields	236,500	10 0	2 0	Sept., 1902	6 6 3	6 8 9
Mysore Gold, Colar Fields	265,000	10 0	4 0	Nov., 1902	7 5 0	7 7 6
Nundydroog, g., Colar Fields	242,000	10 0	1 3	Nov., 1902	2 1 3	2 3 9
Ooregum, g., Colar Fields	171,500	10 0	9	Aug., 1902	1 18 9	2 1 3
Ooregum, pref., g., Colar Fields	120,000	10 0	9	Aug., 1902	2 12 6	2 15 0
African:						
British S. Africa, chartered S. Africa	5,000,000	1 0 0	rts.	May, 1899	3 2 6	3 3 9
Cape Copper, S. Africa	600,000	2 0 0	8 0	Jan., 1902	2 15 0	3 0 0
Cape Copper, pref., S. Africa	150,000	2 0 0	8 0	Jan., 1902	3 2 6	3 7 6
City and Sub'n (New), g., Transvaal	1,360,000	4 0 0	3 0	Aug., 1899	6 5 0	6 10 0
Crown Reef, g., Transvaal	120,000	1 0 0	10 0	Oct., 1902	17 5 0	17 15 0
De Beers Con., d., pref., Cape Colony	1,975,000	2 10 0	15 0	Mar., 1902	18 10 0	19 12 6
De Beers Con., def	2,100,000	2 10 0	12 6	Sept., 1902	21 18 9	22 1 3
Ferreira g., Transvaal	90,000	1 0 0	10 0	Jan., 1902	23 0 0	23 10 0
Geldenhuis Est., g. Transvaal	200,000	1 0 0	5 0	Aug., 1902	6 11 3	6 13 9
Henry Nourse, g., Transvaal	125,000	1 0 0	10 0	June, 1899	8 15 0	9 0 0
Jagersfontein, d., Orange F. S	1,000,000	5 0 0	6 0	Nov., 1899	25 10 0	26 0 0
Jubilee, g., Transvaal	50,000	1 0 0	5 0	July, 1899	5 10 0	5 15 0
Langlaagte Est., g., Transvaal	470,000	1 0 0	3 0	Sept., 1899	3 16 3	3 18 9
May Con., g., Transvaal	290,000	1 0 0	3 0	Feb., 1902	4 11 3	4 13 9
Meyer & Charlton, g., Transvaal	100,000	1 0 0	3 0	Aug., 1902	5 12 6	5 17 6
Namaqua, c., Cape Colony	200,000	2 0 0	2 0	June, 1902	2 15 0	3 0 0
Primrose (New), g., Transvaal	300,000	1 0 0	6 0	Aug., 1899	3 13 9	3 16 3
Rand Mines, g., S. Africa	448,889	5 0	4 0	Aug., 1902	11 7 6	11 8 9
Robinson, g., Transvaal	2,750,000	5 0 0	7 6	Aug., 1902	11 2 6	11 7 6
Wemmer, Transvaal	80,000	1 0 0	15	July, 1902	13 10 0	14 0 0

c.—Copper. d.—Diamonds. g.—Gold. l.—Lead. s.—Silver.

MEXICO. Oct. 31.

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	150	102
Cinco Senores y An., aviadoras	2,000	15.00	295	300
Cinco Senores y An., aviada	400	10.00	265	270
Providencia, San Juan de la Luz	6,000	2.00	215	220
Guerrero:				
Garduno y Anexas	7,200	.....	30	50
Hidalgo:				
Amistad y Concordia	9,800	3.46	68½	69
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	1,538	.....	730	800
La Blanca, aviada	768	.....	630	640
Maravillas y An., aviador	1,680	.....	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	78	79
Santo Tomas Apostol aviador	5,100	.....	3	4
San Rafael y An., Trompillo	1,200	12.00	970	980
San Rafael y An., aviada	1,200	4.00	400	405
Soledad, aviada	960	5.00	375	385
Sorpresa, aviada	960	5.00	330	340

Name of Company.	Shares.	Par Val	Price. Bid.	Price. Ask.
Mexico:				
Alacran	2,400	.....	$30	$40
La Esperanza (El Oro)	3,000	$10.00	800	810
Michoacan:				
Luz de Borda, aviadora	3,000	.....	35	38
Luz de Borda, aviada	1,000	.....	20	15
San Luis Potosi:				
Concepcion y An.	3,000	.....	75	90
El Barreno, aviador	2,000	2.00	60	61
Sta. Maria de la Paz	2,400	10.00	785	790
San Diego y Annexas	2,400	4.00	45	47
Zacatecas:				
Candelaria y Pinos	2,500	.....	125	140
San Carlos y Annexas	2,500	10.00	170	180
Sta. Maria de Gaud	2,500	10.00	150	155
Miscellaneous:				
Bartolome de Medina	2,000	1.50	70	75
Guadalupe Hacienda	10,000	5.00	260	270
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	450	460
National (Oaxaca) aviador	1,800	4.00	.....	.....
San Francisco Hac	6,000	1.00	70	75
Santa Ana Huantla Morelos	4,000	.....	50	70
Union Hacienda	3,000	5.00	305	315

SALT LAKE CITY.* Nov. 7.

Name of Company	Shares.	Par Val	High	Low	Sales.
Ajax	300,000	$10	.34½	.33½	3,303
Ben Butler	500,000	1	.11	.10¾	12,000
Bullion-Beck	100,000	10	.....	.....	.....
California	300,000	1	.35¼	.32	41,600
Carisa	500,000	1	.21¾	.20½	15,800
Century	150,000	1	.95	.84½	20,100
Con. Mercur	1,000,000	5	1.91	1.90	2,000
Daly	150,000	20	1.91½	1.85	600
Daly-Judge	.....	10	9.20	9.05	595
Daly-West	150,000	20	50.	49.40	427
Eagle & B. Bell	250,000	1	.....	.....	.....
Grand Central	250,000	1	5.10	4.95	450
Horn Silver	400,000	25	.....	.....	.....

Name of Company.	Shares.	Par Val	High	Low	Sales.
L. Mammoth	150,000	1	1.59	1.46½	16,700
Mammoth	400,000	25	1.80	1.80	100
May Day	400,000	.25	.28	.22½	41,700
Ontario	150,000	100	.....	.....	.....
Sacramento	1,000,000	5	.26	.23¾	3,000
Star Con	500,000	1	.19¾	.15	4,400
Swansea	100,000	5	.85	.80	500
So. Swansea	300,000	1	.16¼	.16¼	500
Sunshine	250,000	10	.14¾	12	1,900
Uncle Sam, Con	500,000	1	.31½	.29½	5,400
Victor	500,000	1	.17	.16½	2,900
West Mg. Glory	500,000	.10	.....	.....	.....
Yankee Con	500,000	1	.....	.....	.....

All mines are in Utah. *By our Special Correspondent. Total sales, 173,342 shares.

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
Mont., f.o.b., Chicago	"	.07@.07½
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.	.01¾@.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@.03½
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.)		.13⅝@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	"	17.00
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@.05⅛
English flake	"	.08¼@.08½
Glassmakers'	"	.07¼@.08

PAINTS AND COLORS—	Cust.Meas.	Price.
Metallic, brown	sh.ton	$19.00
Red	"	16.00
Ocher, Am. common	"	9.25@10.00
Best	"	21.25@25.00
Dutch, washed	lb.	.04¾
French, washed	"	.01½@.01⅞
Orange mineral, Am.	"	.07¾@.08
Foreign, as to make	"	.08½@.11¼
Paris green, pure, bulk	"	.12
Red lead, American	"	.05¾@.06
Foreign	"	.06⅝@.08
Turpentine, spirits	gal.	.53¼@.53¾
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.	"	.08⅛@.08¼
Scotch	"	.08½@.09
Carbonate	"	.03⅛@.03¼
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	"	.02⅜
Prussiate	"	.11@11½
Silicate, conc.	"	.05
Com'l	"	.01
Sulphate, com'l	100 lb.	.75@.82½
Sulphide	lb.	.01¾
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.	2.20
Oil barrels	"	2.30
TIN—Crystals	lb.	.22
Oxide	"	.45
URANIUM—Oxide	"	2.25@3.00
ZINC—Metallic, ch. pure	"	.07@.09⅞
Carbonate, ppt.	"	.09
Chloride solution, com'l	"	.02¼
Chloride granular	"	.04½@.04⅝
Dust	"	.04½@.04⅝
Sulphate	"	.02½@.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.