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CONTENTS.

DEPARTMENTS.

COPPER production in Australia showed a considerable increase in 1901, the total exports of the metal having been 25,200 tons, or 4,800 tons more than in 1900. The old Wallaroo & Moonta Mines in South Australia increased their output, while a large quantity came also from the Mount Lyall in Tasmania, New South Wales, enlarged its production from Cobar and elsewhere, and a good increase was reported from Queensland, which has heretofore sent out very little of the metal. A still further increase is expected this year, notwithstanding the lower price of the metal.

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THE IMPROVEMENTS introduced into metallurgical practice at the Rio Tinto mines in Spain have been considerable during recent years, though the rate at which economies and new methods of treatment have been effected has not been so rapid as we are accustomed to in this country. The latest improvement has been to introduce a bessemerizing plant at the mines. Hitherto the matte produced at the mines has been forwarded to Swansea for treatment. This matte has only averaged 28 to 34 per cent of copper, so that the saving in cost of transport will be considerable. It is intended eventually to refine the bessemer bars on the spot and export only marketable copper.

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THE REPORT of the investigating committee of the Osceola Mining Company, which is referred to elsewhere, speaks strongly on one point to which the ENGINEERING AND MINING JOURNAL has frequently called attention in referring to this and other companies. That point is the policy and necessity of making fuller reports. Stockholders have a right to know how their property is managed and what is being done with it. Vague general statements—correct perhaps, as far as they go, but really telling nothing—are not sufficient. We have gone over this subject so often that it is not necessary to repeat the arguments here; but it is a satisfaction to find that the Osceola committee has realized their force, and now substantially agrees with us.

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THE REORGANIZATION of English steel works on modern principles is going forward rapidly. The Weardale Steel, Coal and Coke Company, which was taken over by Sir Christopher Furness from representatives of the Baring family a little more than two years ago, is the latest case in point. The steel works belonging to this company have hitherto been some 20 miles inland from the Durham coast, but they are now to be moved to the bank of the Tees, just east of Middlesbrough, where the works and blast furnaces belonging to the Cargo Fleet Iron Company have been purchased. The blast furnaces are being remodeled on modern designs and Talbot continuous steel furnaces are being erected. The great plate mills will be removed to the new works, and plates will then be produced as in America without the metal being cooled at all from the blast furnaces to the mill. The blast furnace gases will be used to supply motive power to the works. A new installation of by-product coke ovens modeled on the best German practice will be built, the gases and other products will be utilized and the coke will be charged hot into the blast furnaces.

IT IS reported that the Commissioner of the State Bureau of Mines, of Colorado, has ordered operations to cease on a small mining claim on Battle Mountain, Cripple Creek, for the reason that the workings were rendered dangerous by the threatening condition of a dump on a larger adjacent property. That the commissioner is to be commended for this reasonable caution in the exercise of his authority cannot be questioned. It will be interesting, however, to note what course the owners of the small mine will now pursue. For no fault of their own they are closed down, owing to a condition which the commissioner deems threatening, but which up to the present time has worked no actual damage. In a word, should not the owners of the dump be compelled to abate the evil at once? Will they not be responsible to the smaller mine for any loss which may accrue to the owners of the latter by obeying the higher authority of the commissioner, which authority they are legally compelled to recognize?

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SILVER touched its lowest recorded price this week, having sold at 50½ cents per ounce in New York, and 23⅜ pence in London. We recently referred to the causes for the present low prices, and as they are likely to continue operative for some time, there is no reason to expect any considerable recovery in quotations, though a slight reaction from the lowest point has already occurred.

We may add that the British trade returns for the quarter ending March 31, show silver imports valued at £2,270,369, or £1,037,032 less than in the first quarter of 1901; while the exports were £2,554,472, or £2,032,302 less than last year. The exports to the East were as follows for the quarter:

	1901.	1902.	Changes.
British East Indies....	£2,467,631	£1,847,749	D. £619,882
China	262,390	16,500	D. 245,890
Japan	20,000	.....	D. 20,000
Totals.....	£2,750,021	£1,864,249	D. £885,772

The almost total suspension of shipments to China from London, show the results of the indemnity payments to European powers, to which we referred in treating of this subject recently.

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THE ABSORPTION—by lease or consolidation—of the Dominion Coal Company, by the Dominion Iron and Steel Company is a natural result of the past and probable future relations of the two companies. The ownership of the two companies also has been practically the same in the past, and it is understood that it still substantially remains so, notwithstanding recent transfers. The Dominion Steel Company is now a Canadian company in ownership as well as in location, the controlling interest in the stock having been transferred from Boston to Montreal. It is possible that this may put an end to the persistent and spiteful depreciation of Dominion Coal stock on the exchanges, the personal causes for which are well understood.

The Dominion Steel Company has an excellent plant, with command of abundant ore and fuel supplies; and it is well situated not only to supply Canadian needs for iron and steel but also to take advantage of any unusual demand that may arise in either the European or American markets. It can

manufacture at a reasonable cost and in addition will have for several years the advantage of the government bounties. Upon the whole, it occupies a position which may make it an important factor in the trade.

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THE OSCEOLA REPORT.

The report of the committee appointed by President Bigelow on his own motion to investigate the affairs of the Osceola Mining Company, is less favorable to the management than might have been expected. Omitting the figures, which are mainly a repetition of those given in the report, one point is that the committee finds that the sales of copper were made in good faith and that there was no evidence of collusion with speculators. The summing up of the committee is embodied in the following paragraph:

"Our conclusions are that the fact that the operations of the Osceola Company in 1901 resulted in a loss is due to a combination of various reasons: (1) to the holding of the greater part of the year's product above the market, in expectation that it could be held at 17 cents—a result which was not realized; (2) to increased cost of mining expenses over former years, caused by increased cost of labor and materials and by development of new ground, much more extended than usual; (3) to the expenditure of $483,000 in expense of new stamp mill and sinking and equipment of new shafts, which have practically made a new mine. The management is responsible for what proved to be bad judgment in its sales of copper. We find that in other respects the management has been efficient, and that the affairs of the company have been honestly conducted and the books and accounts have been properly kept."

These conclusions agree almost entirely with our own criticisms, made at the time, when we said that no serious fault was to be found with the management at the mine, and that the savings effected by the new mill were justifying the expenditure for construction. The faults found were with the Boston management and its selling policy. The latter is put by the committee in an even worse light than was shown by the annual report. The Osceola Company on January 1, 1901, had a stock of 3,343,615 pounds of copper left unsold of its 1900 product. It produced in 1901 13,723,487 pounds—a total of 17,067,102 pounds. Sales reported in 1901 cover about 9,000,000 pounds, leaving about 8,000,000 pounds carried over to 1902.

That is, the Osceola did not dispose of its current production in a year of unprecedented demand; it accumulated or added to its stock about 4,650,000 pounds of copper, which must be sold at 4 or 5 cents a pound below the price obtainable for it at the time it was produced. Comment on such a policy is hardly needed.

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A DECISION ON HYDRAULIC MINING IN CALIFORNIA.

A decision has been rendered by Judge E. A. Davis in the Superior Court of Sutter County, California, which is of very great importance to the hydraulic mining interests of the drainage basins of the Sacramento and San Joaquin rivers, where the principal hydraulic mines of the State are situated. The decision is a severe setback to the miners, as the suit was brought to test the Caminetti law. The court holds that said law is not absolute and that the permits granted by the California Debris Commission appointed under that law are no bar to injunction suits when the debris from the hydraulic mines is injuring the rivers and valley lands, even though the miners have constructed impounding dams in accordance with plans under supervision of the Commission.

The miners contended that the court had no jurisdiction, since they were operating their mines under permit of the United States Government commission authorized by the Caminetti law to grant permits to mine when certain conditions were complied with. These conditions had been complied with, and dams, etc., erected. The Polar Bear Mine was operating under a permit of the Commission, and it was thought the courts could not issue injunctions to stop mining. At one time so many injunctions were issued at the suit of the Anti-Debris Association that most of the hydraulic mines had to close, but it was supposed that all this was ended when the Caminetti law was passed.

After discussing the powers of the Debris Commission the court said: "But when a person below his mine complains that some of the tailings escape without restraint and come down the stream and injure his property and damage him, such person is not required by the act to apply to the Commission for relief; for, as we have seen, that tribunal can not close down the mine it has authorized to work under its permit without itself applying to the court, and it could therefore afford no relief."

It is further held in the opinion that "hydraulic mining is a public nuisance when the debris is not wholly restrained, and that Congress can not legalize a nuisance. That a man can not be deprived of his property without due process of law and without a hearing or trial. That Congress can not interfere between citizens of the same State and that the right of trial by jury exists, and in fact the plaintiff is protected by the State and Federal constitutions."

The Court further says: "It is thus seen that any person may now carry on hydraulic mining regardless of said Act so long as he so disposes of his tailings that they will not injure navigable streams or the property of others."

Judge Davis in his opinion goes fully into the arguments of counsel for the defendant company, who claimed that in creating the California Debris Commission the intent of the Caminetti Act was to provide a tribunal with final and exclusive powers to determine the sufficiency of restraining works, and whose permit to mine would operate as a bar to anti-debris suits and injunctions from the courts. He holds that Congress never intended to deprive the courts of jurisdiction in such cases, and had no power to do so, had such intention existed. He shows that the main object of the act was to give the hydraulic miners the aid of expert Government engineers in planning restraining works, and to forbid hydraulic mining on the Sacramento and San Joaquin rivers and their tributaries, such as would injure navigable waters, etc. Congress did not give the Commission the most ordinary powers of a court, such as the issue of subpœnas and that of imposing punishment for hydraulic mining after revocation of license by the Commission. The fines and penalties provided by the act are left to be imposed by the Federal courts, in which the Commission appears as complainant. And in conclusion, Judge Davis holds that if the Commission has lawful power to exercise any functions of a judicial character, while acting in the interests of hydraulic mining, the power relates only to those persons who volnutarily place themselves within its jurisdiction, and its orders or judgments can bind no one else—certainly no person injured.

The case will at once be appealed to the Supreme Court. If the present decision stands it will practically put an end to large and small hydraulic operations in the region of California referred to, since the way is open to any one, no matter how far distant from the mine, to annoy the miners by injunction suits. Moreover, there is again the opportunity for blackmail which existed before the passage of the Caminetti Act, and about which there was much scandal. The California Miners' Association, which was instrumental in obtaining the passage of the Caminetti law, and which spent many thousands of dollars in bringng about what was supposed to be an amicable and final settlement, is much discouraged over the outcome of this suit. With large mines at the mercy of local courts and prejudiced farmers there will be no encouragement for investing in hydraulic mines in that part of California where the streams empty into navigable rivers.

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AN EPISODE IN THE HISTORY OF THE ANTHRACITE TRADE.

The death of Archibald A. McLeod, some time general manager and later president of the Philadelphia & Reading Railroad Company, recalls the fact that ten years ago he was blamed for bringing the Reading down to its second bankruptcy, even more severely than Franklin B. Gowen was for the first failure. The blame was just, at least to a certain extent; nevertheless Mr. McLeod lived to see his plans substantially carried out—with one exception—though by different men and in a somewhat different way.

Mr. McLeod was called to the Reading from a small road in New York, where he had made an excellent record as an operating manager. It was during the period when the company was under the management of the late Austin Corbin, after the first reorganization. As general manager he made many improvements in the methods of operating the road, and in its physical condition and equipment; and when Mr. Corbin retired from the presidency, Mr. McLeod was chosen to succeed him. In a little more than a year after he became president, he had developed the plan which made his reputation and then lost it. This plan was to unite the anthracite coal trade practically under one management, and to put an end to the competition and the quarrels which had made the trade unprofitable for several years. To carry it into effect he arranged, early in 1892, leases by the Reading of the Lehigh Valley and the New Jersey Central; and also established friendly relations with the Delaware, Lackawanna & Western, believing that the control of so large a part of the anthracite output would enable him before long to bring the remaining companies to his terms.

So far, the plan was, as we have said, very much the same that has since been carried out; but without reflecting that the Reading was already dangerously overloaded, Mr. McLeod permitted himself to be carried away by an idea which has cost investors many millions, and has always proved a failure in execution—that of a short railroad connection between the anthracite coal-fields on the one hand and Central and Northern New England on the other. To carry this out he acquired control of the various short roads forming the line from the Lehigh Valley to Hartford by way of the Poughkeepsie Bridge, and he arranged to buy large interests in the stocks of the New York & New England and the Boston & Maine companies, becoming for a time president of both those railroads.

These last operations, however, were too much for the already overstrained credit of the Reading Company. The interests in the two New England roads—bought on margins only—were lost; the Reading Company passed into its second receivership in February, 1893; the leases of the Lehigh Valley and the New Jersey Central were surrendered; and the unification of the anthracite trade was postponed for nearly ten years. The man who had been the most prominent figure in the railroad world for two years, practically disappeared from it, and little more was heard from him.

Mr. McLeod was undoubtedly a man of ability,

and his plans had many points to recommend them. He failed because he made two serious mistakes in executing them. The first and the capital one was in the choice of time. The Philadelphia & Reading Company was not strong enough to expand, and the panic of 1893 was already foreseen by longer heads, making capital wary and investors uneasy. Money was scarce and growing week by week harder to obtain for big schemes, especially with the recent bankruptcy of his company fresh in memory. The New England extension was doomed to failure from the beginning; and in any event to carry it out as planned would have required far more money than its projector could hope to command. The collapse which followed was inevitable.

Mr. McLeod lived to see his plans for the anthracite trade carried out, in a slightly different form by Mr. J. P. Morgan and his associates, who secured their object with comparative ease, assisted as they were by the extraordinary prosperity and abundance of money which have marked the past two years. The Philadelphia & Reading Company, which under Franklin B. Gowen lead in the general acquisition of the anthracite coal lands by the transportation companies, and under A. A. McLeod pointed the way to the unification of the anthracite trade, is now the leading instrument in the hands of the capitalists who have acquired the control of that trade.

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THE METRIC SYSTEM.

A correspondent, whose letter is published on another page, suggests some objections to the introduction of the metric system, and to the bill now before Congress providing for its early adoption, which seem to deserve consideration. We do not think that the reasons are sufficient, and we are not moved by them to change our advocacy of the bill; but they represent the adverse side of the case in a reasonable way, and perhaps in the best way possible.

Our correspondent—who is, we may say, a mining engineer of experience—frankly admits that, considered in the abstract, the metric system is a good one, and is far superior to our present system—or rather, heterogeneous jumble—of weights and measures; so that there is no need to go into this part of the subject again. Indeed this point has been so far established that its discussion here would simply be useless repetition.

Our correspondent's points are really four in number: The cost of making the change; the difficulty of teaching it to workmen and to the people in general; the confusion which would follow a change; and the necessity for new text and reference books. There are some minor points, but upon those given the main argument rests. Of all the four the first seems to have impressed him most strongly.

Undoubtedly the cost of the change would be a matter of some importance, though we are inclined to think that its probable amount has been much over-estimated. One great difficulty would, of course, be found in replacing or readjusting the scales and other measures in common use in trade; but in this case the expense would be very widely distributed and the amount required in individual cases would be usually very small. A more important matter is found in the gauges, tools and patterns in manufacturing establishments; but here the cost is over-rated and we believe that the expense would not be serious enough to overbalance the advantages to be gained. The alterations in gauges, templets and the like would in the majority of cases be very small; while patterns have so frequently to be altered or changed in size, that a few additional changes would matter comparatively little. It must be remembered also that patterns and gauges wear out and must frequently be renewed; though our correspondent seems to assume that they are indestructible.

Moreover the matter of cost is one that can be urged against any change or improvement of any kind. It has been and is still so urged by unprogressive people, for whom the tools and appliances of their fathers are good enough, especially if new ones cost money. Fortunately such persons are not a majority, nor even a large proportion of our people. In recent discussions over the expansion of our foreign trade the assumed superiority of American manufactures has been very generally ascribed to the fact that our shop managers are always ready to adopt improvements, even where they have to throw aside tools and machinery which are still in good condition; while our foreign competitors will not do so, but cling to the old appliances because the adoption of others is expensive. To a great extent this is true; and the mere fact that a change involves some expense should not be an argument with us, if it is proved that there is anything to be gained by it. The cost argument, indeed, if pushed to its limit, or if it had been applied in times past as it is proposed to use it now, would simply have checked all improvement and left us far behind our present position.

To the second argument also we think our correspondent attaches far too much importance. He underrates the intelligence of the average American workman, and the quickness with which a change is accepted or a new method taken up. Moreover he does not consider the fact that in many States the metric system has been for some time taught in the regular school courses, so that everyone who has had a common school teaching knows something about it. There is found also among our workmen an element composed of foreign born men—chiefly Germans—who were brought up on the metric system, and their experience is not to be neglected. Cards, text-books and other publications showing the system have been widely published and can be found in many places. That the system is known to and its advantages appreciated by many American workmen the writer has had many opportunities of learning. Our money system has educated our people generally in the advantages of decimal calculations. Years ago, when the metric system was much less known than it is now, the writer was employed as draftsman in a large shop, and was then approached by the foreman pattern-maker with the request that dimensions on drawings be given in decimals of an inch—or of a foot if possible—as being so much more convenient than the familiar eighths and sixteenths. The suggestion was only negatived on account of a superintendent who had been brought up on old fashioned rule-of-thumb methods and whose favorite variation in dimensions was "a sixteenth of an inch a leetle stout." About the same time an order was received from abroad for machinery which was to be built strictly to specifications, and all the dimensions for which were given in meters and millimeters; but very little difficulty was found in putting the work through. These are only instances; but they show how much less trouble may be expected in this direction than our correspondent supposes.

Moreover, it would not be necessary, as our correspondent assumes, to make new gauges on familiar sizes the exact equivalents of the old ones. Thus an inch pipe would not be hereafter a 25.39-millimeter pipe, but an even 25-millimeter; and so with other dimensions. The slight changes would be easy and practicable, and there would be no necessity for the use of long decimals.

True, some confusion may be expected to follow the change; but we do not believe that it will be serious, or long continued. Such a condition is inevitable in any change of the kind, but common sense will reduce it to a minimum.

The objection as to text and reference books has, we admit, some weight. The same arguments apply to old books, however, as to old tools. Advances in knowledge and changes in practice are so frequent now, that new editions of even the best and most used standard books are constantly required, and the conversion of the rules and formulas to metric terms will only be a part of the required revisions. Moreover it must be remembered that in the important science of chemistry metric measures are already in general use, which is really an important step towards the change. The opinion of most scientific men is in favor of the change; so also is that of very many engineers. The action of the American Society of Mechanical Engineers against it, of which much has been made in some quarters, is not, we are convinced, that of a real majority of the Society, most of whose members are progressive men; it has been inspired by the narrow and obstinately conservative Philadelphia clique which has in this—as in other cases—dictated the official action of the Society, to its injury. It is a manifestation of the spirit which was shown by the assertion of one member that "we do not want foreign trade."

It seems to us that a considerable part of our correspondent's argument, if carefully considered, bears really in favor of making the change at an early date. The longer it is postponed, the greater the difficulties which will exist—or at least appear to exist.

We have endeavored briefly to sum up our correspondent's argument and to suggest the answers to it; and we believe that these, imperfectly stated as they are, will be found sufficient.

COMBINATION OF MINING COMPANIES IN COLORADO.

Following the trend of recent commercial policy, the consolidation of mines and mining corporations seems to be a natural sequence to that of the samplers and reduction works. For some time owners of successful producing mines in Colorado have been securing adjacent properties by purchase or through consolidation of interests. Prominent among the former of these is the Tomboy Mines Company of Marshall Basin, which has within the last year obtained by direct purchase the now famous Argentine, the Cincinnati and other locations on the adjacent Argentine vein.

Following these minor but significant transactions is the announcement of the most important consolidation yet consummated in the West, and which will doubtless be read with interest by other organizations similarly situated as to location and mutual relations. This consolidation, to which no official title has yet been given, has been formed on a basis of 5,000,000 shares, of a par value of $1 each, and includes all the properties and interests of the following companies, to which list is added the proportional shares of stock issued to each, after reserving 1,005,231 shares to be held in the treasury for future disposal or distribution.

	Shares.
Consolidated Mining Co.	1,908,000
New Zealand Consolidated Mining Co.	920,000
Damon Gold Mining Co.	200,000
Columbine-Victor Deep Mining & Tunnel Co.	200,000
Battle Mountain Consolidated Gold Mining Co.	485,160
Columbine Gold Mining Co.	29,709
Bonanza Queen Gold Mining Co.	25,000
United Mines Transportation Co.	226,900

At the present time the total number of stockholders in the several properties is 2,700, representing a total holding in the Cripple Creek District of 375 acres, which can now be developed in a systematic and economical manner with little waste in unheeded shafts, tunnels and surface improvements.

THE DIVERGENCE OF LONG PLUMB LINES AT THE TAMARACK MINE

By Prof. F. W. McNair, Michigan College of Mines.

In September last it was my fortune to be present together with Professor James Fisher of the College of Mines at a "plumbing" of No. 5 Shaft of the Tamarack Mine. The plumbing was under the direction of Mr. J. B. Watson, the chief engineer for the Tamarack Mining Company.

The method employed was the well known one of transferring an azimuth from surface to some underground level by means of two plumb lines hung in the shaft. The remarkable feature lay in between their lower extremities at the 29th level. The upper measurement was 16.32 feet, that below 16.43 feet, showing a divergence of the lines to the amount of 0.11 feet. As the west wire, which had been lowered in the center of the shaft compartment in which it hung, and had been moved to the east until it was about half a foot from the dividers between that and the next compartment, it was inferred that some projecting object might be interfering with its freedom. A careful exploration of the shaft, occupying between two and three hours, revealed no such interference. To make certain, however, this west wire was moved westward from the west bob to these pipes was something like 7 feet. The east bob being 24 or 25 feet away would of course be affected to a much less degree. The behavior of the west wire seemed to confirm such a theory. There was considerable torsional vibration in both wires, and it seemed that a slight horizontal polarity in the west bob, which would at times coincide with, and at others oppose the field created by the pipes, might account for the observed irregularity in the vibration of this wire when compared with the vibration of that hanging in the east compartment. The latter remained remarkably steady throughout the entire time it was under observation.

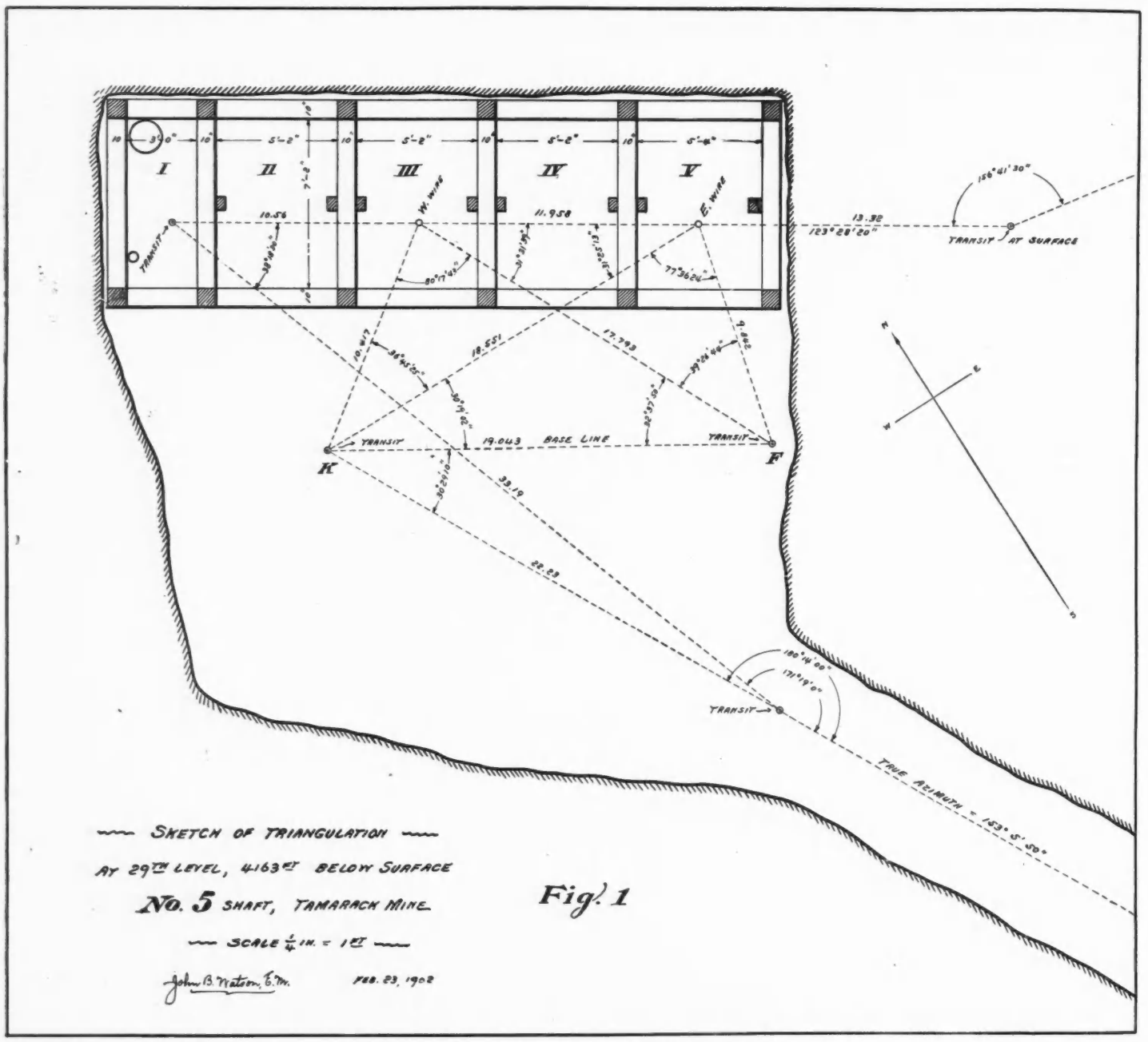


Fig. 1

PLUMBING DEEP SHAFTS IN THE TAMARACK MINE.

that the depth of the chosen level, and, consequently, the length of the lines was greater than in any previously recorded instance. The lines as hung were 4,250 feet in length; they were of No. 24 piano wire, and the bobs were of cast iron weighing 50 pounds each. The latter were swung in pails of cylinder oil for damping the vibrations. Great care was taken that the lines should be free, and that they should be protected at the bottom from dropping water, of which, indeed, there is not a great deal in the shaft. No attempt was made to completely stop vibration. Scales were erected behind each wire, and its mean position determined by observing the extent of the swing. When the wires had settled into a state as near quiescence as it was expected they would reach, a check measurement was taken between them at surface, and toward the center of the compartment 1.26 feet. When all was quiet again, measurements as before were taken, showing a distance at surface of 17.58 feet, and at the 29th level of 17.65 feet, there being yet a divergence of 0.07 foot.

Possible causes were at once freely discussed among those who were present. Gravitation being suggested, I drew attention to Newton's theorem of the attraction on a mass within a closed spherical shell, adding that the same must be true in a tube of great length. I was inclined to explain the divergence on the theory that the air pipes in the west end of the shaft (of which there are two, a 16-inch in the northwest corner and a 4-inch one near the southwest corner) were acting as magnets, and, because of its proximity, were attracting the bob on the west wire out of its normal position. The distance under the circumstances I advised the use of lead bobs in a plumbing of No. 2 shaft, which took place about a week after that at No. 5. I did not advise a change to wire of non-magnetic material for it did not appear to me that polarity in the wire, which would of course exist, could develop sufficient force to bring about the observed divergence.

To my surprise Mr. Watson reported that the wires hung in No. 2, although about 120 feet shorter than in No. 5, and although lead bobs had been used, yet showed a divergence of 0.10 foot, and, further, that from comparison with other surveys, he had reason to believe that the azimuth of the wires at the bottom was considerably greater than at the top. At the surface they were 12.60 feet apart. An examination of the magnetic conditions yielded a possible explanation of the greater azimuth in that

the air pipe in the southwest corner of the shaft terminated not far below the bob on the west wire. A repulsion between the lower end of this pipe and the lower end of the west wire, presumably of the same north polarity, might account for the increased azimuth. It could not however account for the divergence.

The publication about this time in the Portage Lake *Mining Gazette* of the fact that a divergence in the plumb lines had been observed, attracted considerable attention, and brought forth many attempts to explain its existence. Those most familiar with the conditions had no satisfactory theory to offer. To them it was evident that more data must be secured before the cause could be correctly assigned.

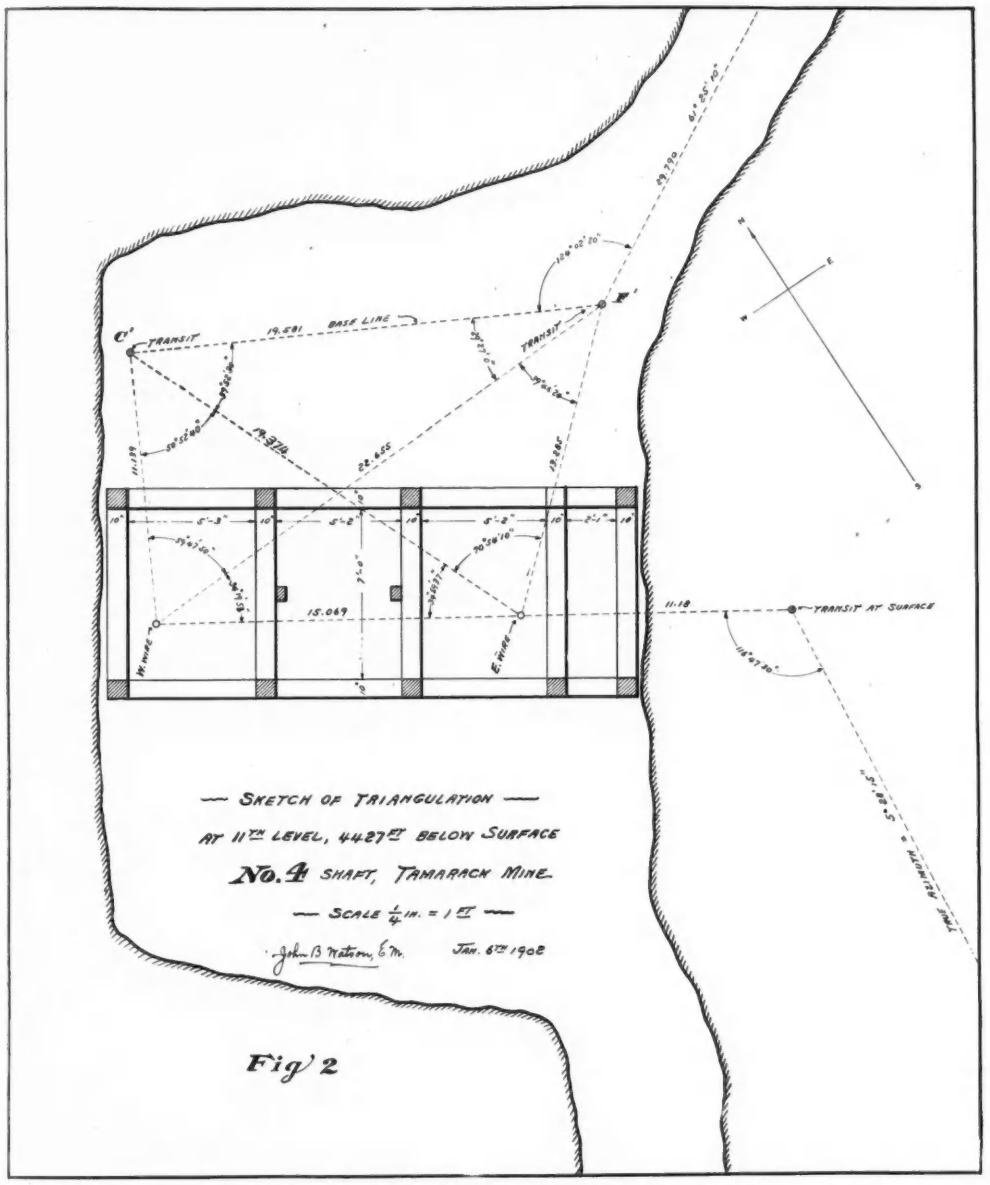


Fig 2

PLUMBING DEEP SHAFTS IN THE TAMARACK MINE.

Among the proffered explanations, two are worthy of notice. The first was that the divergence was due to the greater attraction of the material at the end of the shaft for the bob hanging nearest it. It is remarkable how many trained persons, engineers and others, held to this view. There seems to exist a general lack of appreciation of the forces of gravitation, except in the single instance of the force between the earth and objects upon it. It is, of course, true that the attractions on each bob toward the ends of the shaft are different, the stronger being toward the end nearest to which the bob hangs. Further, these differences tend to diverge the wires, but their amounts are so insignificant as to put them quite out of consideration. The sum in this case is only a few hundredths of a grain, and the consequent divergence about a thousandth of a foot.

The second explanation worth notice was offered by Professor William Hallock of Columbia University. This was that of mutual repulsion between like poles at the lower extremities of the wires. It was subsequently modified (see *Electrical World and Engineer*, February 8, 1902), to include as well repulsion between like consequent poles distributed along the wires.

Meantime the management of the Tamarack Mine, with its characteristic interest in scientific things, had granted me permission to carry on further experiments in No. 4 Shaft. This shaft is particularly adapted to experiments of this kind, especially as it is much freer from magnetic material than any of the others. Mr. Watson entered heartily into the project, and the experiments which were conducted were hardly less under his direction than mine. The actual work was shared by Professor Fisher and Instructors N. S. Osborne and E. D. Grant of the College of Mines, and by Mr. Slock, assistant engineer at the mine. Phosphor-bronze wire No. 20 B. & S. gauge was chosen for the lines; 60-pound lead bobs were hung at the bottom, first in oil, but subsequently in water, the latter being found by far the more satisfactory medium. These lines were hung as far apart as the conditions in the shaft would permit, and were approximately 4,440 feet in length from point of suspension to bottom of the bob.

Means were taken to locate the wires in a horizontal plane. At first a base line was laid off for each wire. The wire was observed by transits simultaneously from both ends of the line, and the two wires were under observation at the same time. This scheme was almost immediately abandoned for the simpler one of a single base line common to the two wires. A transit was mounted at either end of the base, and it observed alternately each wire. The method is exhibited in Fig. 1 which is a horizontal cross section of No. 5 Shaft at the 29th level, and also in Fig. 2, a cross section of No. 4 Shaft at the 11th level. In each figure W and E are the positions of the wires, while K and F in the one and F′ and C′ in the other are those of the transits. In each case the base line was tied to permanent marks in the neighborhood of the plat at which the observations were taken. Scales were erected behind the wires in a position perpendicular to the line of sight, and as near the wires as was convenient. Most of the time a scale in sixteenth inches numbered decimally was used. At first the wires were allowed to vibrate as they would, but for most of the observations they were set vibrating parallel to the scale on which it was desired to read mean position by drawing them aside from half to three-quarters of an inch, then allowing them to swing freely. An odd number of readings was taken, as in the method of determining the zero point of a balance by observing the vibrations of its pointer. Great care was taken to protect the wires as far as possible from disturbing influences, such as currents of air and dropping water.

As showing the constancy of the mean positions of the wires, it may be of interest to quote an example from observations at No. 4 Shaft, and one from No. 5. I quote, from the note book, observations at No. 4 Shaft, January 9, 1902:

Station C, east wire, McNair.		Station C, east wire, Watson.	
Left.	Right.	Left.	Right.
56.6	....	....	74.5
58.1	63.4	51.0	67.5
60.5	64.3	57.5	68.0
59.0	65.5	55.0	70.5
60.7	62.8	50.5	67.0
59.3	65.4	56.0	66.5
57.0	62.2	50.5	64.2
Mean position, 61.3.		57.3	66.8
		Mean position, 61.7	
Mean of the two sets, 61.5.			

The interval of time between the above sets is not recorded in the note book, but is remembered as being between one and two hours.

Again, from the note book, No. 5 Shaft February 23, 1902:

Station F, west wire, Osborne.		Station F, west wire, Fisher.	
Left.	Right.	Left.	Right.
44.5	....	....	58.3
45.3	60.6	47.3	57.8
45.9	60.2	49.7	56.2
49.2	58.7	49.9	54.6
49.0	56.6	52.0	54.7
49.1	56.4		
48.8	56.0	Mean position,	53.0
Mean position,	52.8	Time,	3.40 p. m.
Time,	11.40 a. m.		
Mean of the two sets, 52.9.			

It will be seen from these examples that the mean positions of the wires were very constant for considerable periods of time.

The angles in the figures were read by repetition to some mark of the scale near to the mean position. They were afterwards corrected for the difference between the mark chosen and the mean position of the wire assumed from the observations. Check measurements of distances from instruments to wires were taken, the wires being held as near as might be in the mean positions. It is thought that the distance between the mean positions of the wires was determined with an error not greater than 0.003 feet.

After hanging the bronze wires in No. 4 Shaft and finding a small convergence, it was decided to hang the steel wires in this shaft in the same position at the top as the bronze lines, and note their positions at the bottom, both with lead bobs, and with iron bobs. The bobs were first in oil, subsequently in water. The results for distances between the wires are exhibited in the following table:

Plumb Lines in No. 4 Shaft, Tamarack Mine.

Date 1902.	Wires.	Bobs.	Medium.	Dist. in feet. Surface.	11th level	Cov'nce. in feet.
Jan. 3	Bronze	Lead	Oil	15.089	15.061	0.028
6	Steel	Lead	Oil	15.089	15.074	0.015
6	Steel	Lead	Water	15.089	15.074	0.015
6	Steel	Iron	Water	15.089	15.062	0.027
9	Bronze	Lead	Water	14.607	14.611	*0.004

*Divergence.

Whatever might be the cause for the slight convergence observed, the results of these observations seemed to afford ample experimental proof that

neither gravitation nor magnetism could account for the divergence originally observed in No. 5 Shaft. The shorter distance between the bronze wires as hung the second time was due to the necessity for moving the western one to avoid contact with pieces of steel wire which were lodged in the west compartment on the breaking of the line which had hung in this compartment on January 6. After the compartment was supposed to be clear, the west wire was moved east to further ensure its freedom.

About the middle of January the bronze wires were hung in No. 5 Shaft as near as might be in the positions occupied by the steel ones in September. The distance between them at the top was 16.709 feet, while at the bottom the observations gave 16.850 feet, showing a divergence of 0.141 feet. This divergence it will be noted is greater than that observed in the case of the steel wires in September. We are now convinced that the behavior of the wires was to be explained by assuming that one or both of them were deflected from the normal position by the currents of air which circulated in the shaft. This suggestion of air currents had been made early in the work. It was treated with scant courtesy in the beginning, because it did not seem probable that the currents of air could be steady enough, both in volume and direction, to permit the constancy of mean position which had been observed. However, the hypothesis once admitted, it appeared that it might account for all of the observed phenomena. Desiring to make the proof as complete as possible, it was decided to hang the bronze wires once more in No. 5 Shaft, but this time to place the west wire in the compartment next the air shaft rather than in it.

It should be remarked here that during the sinking of this shaft, and until it is connected with some other portion of the mine, its ventilation is accomplished by dividing it into two parts by means of a tight casing between Compartments II and III, Fig. 1. Compartments I and II form the so-called air shaft. An up-draft is induced in this air shaft causing a down-cast in the other three compartments. At the time of the September and January plumbings there existed at different levels a number of openings in the casing. These openings permitted a rush of air from the downcast side into the upcast compartments. The effect of these currents of air would be to move the west wire toward the west. If these openings were closed off and the west wire hung in the compartment next the air shaft, No. III of the figure, it seemed that the divergence would disappear, provided it were due to the assigned cause. They were hung in these positions on February 23, the east wire hanging as near as might be in the position occupied in September and January, the west one as near as might be in the center of the compartment next the air shaft. The positions are shown in the figure. Communication between the air shaft and the downcast portion had been carefully stopped off as far down as the 29th level. Further, to prevent circulation as much as possible, the shaft was covered at the top as soon as the wires were in position. It was quickly evident that circulation could not be wholly stopped. There was yet a considerable convection current down close to the casing of the air shaft, and up in the two eastern compartments, the cause for this current being the difference in temperature between the top and the bottom of the shaft. Its distribution is explained by the fact that before the shaft was covered, the down-cast current was strongest close to the casing. As the covering failed to stop circulation, the strongest portion of the down-cast naturally maintained the position it already occupied. The measurements between the wires were, at top 11.944 feet, at bottom 11.962 feet, showing a divergence of 0.018 feet. This divergence was easily accounted for by the convection current above described.

The difference between the divergence of the steel wires in September and of the bronze wires in January is readily accounted for by the fact that the circulation in the warm weather of September was much less vigorous in January, and, further, that the steel wires afforded the smaller surface to be acted upon.

Consideration of the currents in No. 2 Shaft, which is downcast, accounts for both the divergence and the increased azimuth there observed. The small convergence in No. 4 may likewise be accounted for by the swirl of the currents as they enter this shaft, which is up-cast. Although an effort was made to stop these as far as possible during the actual observations, it was not practicable to entirely cut them off. The contour of the walls of the plats above the eleventh level in the shaft is such that the air currents from the cross cuts hugging the outside of the curve will on actually entering the shaft have a tendency from the western wall toward the center, and this tendency will apparently be stronger close to the western wall than a little distance from it. Consequently, when the west bronze wire was moved away from this wall the wires hung more nearly parallel than when it was close to the wall.

It seems, therefore, that a very simple cause was at the bottom of the divergence which attracted so much attention. The remarkable fact is that the currents of air should be so constant in their action. When, however, the great depth of the shafts is considered, also the constancy for considerable periods of time of the temperatures which may influence these currents, it seems after all reasonable that this steadiness should exist. The experiments have shown that the engineer who has before him the problem of plumbing a deep shaft has very considerable difficulties to overcome in the matter of the influence of the circulation of air in the shaft on his lines. He should study this circulation very intently before deciding where to hang them, and in order to estimate the dependence that is to be placed on his results when the lines have been hung.

NATURE OF WYOMING PLATINUM ORES.—The finding of platinum in the copper ores of the Rambler Mine, about 50 miles southwest of Laramie, Wyo., caused considerable comment in the mining world a few months ago, and there was considerable speculation as to how the metal occurred. In a recent number of the *American Journal of Science*, H. L. Wells and S. L. Penfield state that by alternate treatment of covellite ore from the mine with strong boiling nitric acid and caustic soda solution, a concentrate was obtained from which a few glittering, highly modified crystals were isolated, weighing approximately 0.00004 gram. These fused on heating gave a sublimate of crystalline arsenious oxide, and the residue when dissolved in aqua regia gave, on evaporation with ammonium chloride, yellow octahedral crystals of ammonium platinic chloride. The crystals, therefore, were doubtless sperrylite, $PtAs_2$, but the authors do not assert that platinum may not occur in some other form in the ore. Professor Wilbur C. Knight has published in the Engineering and Mining Journal and elsewhere reports showing that the Rambler ore is generally platiniferous, running from 0.06 ounce to 1.4 ounces per ton (0.0002 to 0.0048 per cent), and that it may prove of commercial importance. The authors express the hope that copper ores will hereafter be carefully examined for platinum, since the occurrences of sperrylite seem to show its association chiefly with ores of copper.

IRON AND STEEL EXPORTS OF GREAT BRITAIN.—Exports of iron and steel from Great Britain for the three months ending March 31 were valued by the Board of Trade returns as below:

	1901.	1902.		Changes.
Iron and steel....	£6,010,258	£6,146,769	I.	£136,511
Machinery	4,259,209	3,971,419	D.	287,790
New ships.....	3,572,457	1,733,604	D.	1,838,853
Total.....	£13,841,924	£11,851,792	D.	£1,990,132

A considerable increase was shown this year in the quantities of some important items, such as castings of all kinds, bar and merchant steel and tin plates.

MANUFACTURE OF BARIUM SALTS.

Barium occurs in nature as sulphate and carbonate, the former being the more common and consequently the source generally resorted to for the preparation of barium compounds. Barium sulphate being insoluble in all acids, the method heretofore employed for converting it into a soluble form has been to heat it, finely ground and mixed with coal slack, in a reverberatory furnace, whereby the sulphate is reduced to sulphide, which is soluble in water. The percentage of sulphate reduced is likely to be unsatisfactory, however, and the process is not free from difficulty in other respects. A noteworthy advance in the art appears to have been made by Mr. Charles B. Jacobs, who described his new process in the *Journal* of the Society of Chemical Industry, of March 31, 1902, this being the publication of a paper read before the New York section of the society, February 21, 1902. This process has passed beyond the experimental stage, being already in commercial application by the United Barium Company, of Niagara Falls, N. Y.

Mr. Jacobs found that at the high temperature obtainable with the electric furnace three molecular parts of barium sulphate are reduced by one of barium sulphide to barium oxide, with the evolution of sulphurous anhydride. This reaction is precisely analogous to that which occurs in heating a similar mixture of zinc sulphate and sulphide, but apparently requires a much higher temperature. In practice the barium sulphide is formed in the single furnace operation, by mixing with the charge sufficient coke to reduce one-fourth of the barytes. The reactions which take place are represented by the following equations:

$$4BaSO_4 + 4C = 3BaSO_4 + BaS + 4CO$$
$$3BaSO_4 + BaS = 4BaO + 4SO_2$$

The furnaces employed are of the continuously operating type, being tapped periodically. They have a maximum power consumption of 500 kilowatts and a maximum output of 8 tons of product per 24 hours. The product is purified by dissolving it in hot water (caustic baryta is much more readily soluble than caustic lime) and crystallizing out the hydrate, $Ba(OH)_2 + 8H_2O$. A small quantity of barium sulphydrate collects in the mother liquor, which is available for the production of other salts of barium. The crystals of barium hydrate, after a thorough washing with a spray of cold water and drying, are melted and run into thin iron drums, which hold 500 pounds. It contains less than 1 per cent of impurities.

Owing to the high degree of efficiency of this process, whereby 97 to 98 per cent of the barium sulphate in the crude mineral is extracted, and at relatively low cost, it can produce baryta and the salts of barium at a price which will doubtless result in a great increase in their consumption. Already it has been found necessary to increase the capacity of the plant to 60 tons per day, although it has been less than a year in operation. Hitherto the make of hydrate has been taken chiefly by the beet sugar industry, but besides that there are various other highly promising channels of consumption. Steps are being taken to utilize, for the manufacture of sulphuric acid, the sulphurous gas which is evolved during the smelting of the barytes, which would indeed make a well rounded process.

COST OF A SINGLE-FLOOR MILL.—A workshop, 120 by 180 feet, with a single floor at ground level, recently erected in Massachusetts, cost 65 cents per square foot. The framing conformed to the principles of standard mill construction. The roof was 3-inch plank, tarred and gravelled. The sides were closed in with windows of translucent glass, hinged from the top and swinging outward, each window filling a bay down to about 3 feet from the ground. Below the windows, the sides were concrete, laid on expanded metal. Additional light was provided by monitors in the roof. The floor consisted of 4 inches of concrete, surfaced smoothly, laid on 8 inches of clinker, well packed down.

THE BETHLEHEM STEAM HAMMER.

According to *Engineering News*, the great 125-ton steam hammer at the Bethlehem Steel Works, the largest tool of the kind in the world, is to be taken down. For six or seven years this great appliance has been standing idle, and a short time ago work on its demolition and removal was begun.

After the hammer was built, as part of a large plant for producing the heaviest class of steel forgings, there were put up in the same building some large hydraulic presses. In the subsequent competition between the two types of machines the presses have come out ahead. It was found that in the forging of large masses of metal by blows from a hammer, even though the ram weighed 125 tons, some undesirable effects were produced. As a definite amount of time is required for the molecules of the metal to flow, the action of the blow was so rapid that the compression could not distribute itself uniformly through the mass; as a result the outside of the forging was worked and stretched while the inside remained practically unchanged. Internal stresses were thus set up, and there was a tendency for the formation of flaws in the interior. Especially was this true of shafts for steam engines, which were one of the important products of the great forging plant. With the press, on the other hand, the force is applied slowly and is as strong at the end of the stroke as at the beginning, so that a forging is made absolutely homogeneous, the interior of the piece being as thoroughly and effectively worked as the exterior. Besides this, the press is a more convenient tool to operate and maintain than the hammer.

At the time of its construction the Bethlehem hammer was by far the largest and heaviest in the world—the only one approaching it being at the Creusot Works, in France—and we believe it has never been surpassed in this respect. Briefly described, it was a vertical single-acting steam engine, with a heavy ram attached to the piston rod. Steam admitted below the piston raised the ram, and its fall produced the desired blow. The steam cylinder had a bore of 76 inches, and the piston had a normal stroke of about 16 feet, which could be increased to nearly 20 feet. The total weight of the moving mass, piston piston-rod and ram, was 125 tons. The working steam-pressure was 120 lbs. per square foot. The hammer stood about 90 feet high above the ground, and measured 38 feet across at its base.

NEW COAL FIELDS IN BELGIUM.—At a recent meeting the Liege Geological Society discussed the question of recent discoveries of coal in the district known as La Campine, situated in the province of Antwerp. The existence of coal beds in Northern Flanders has for some time past been a matter of practical certainty; and expert opinion now inclines to the belief that there is an extensive coal-field in this part of Belgium which connects those of Yorkshire with the Westphalian deposits.

A BORAX MINE IN SOUTHERN OREGON.

By W. B. Dennis.

Borax has been mined from borate marsh deposits in Harney County, in Southeastern Oregon, for some five years past. The deposit covers about 10,000 acres of low land lying immediately south of Lake Alvord, a small lake between longitude 40° and 42° West and the 7th and 8th standard parallels, South. With the present transportation facilities not more than 25 per cent of this area is capable of yielding ore of sufficient high grade to pay for working. The richest portion of the deposit, consisting of some 2,000 acres, lies close to the lake and is owned by the Rose Valley Borax Company, of Reno, Nevada.

Topographically, this area is perfectly level and treeless. The ground is covered with a white incrustation several inches thick of borate of soda, containing sodium carbonate, sodium sulphate, sodium chloride, etc., in varying proportions. During the long dry summers of that region the loose surface deposit is carefuly shoveled by hand into small conical mounds or heaps set in regular rows and resembling a hay field at harvest time. After removing the original incrustation borates are again formed and in a comparatively short time a second incrustation covers the ground. It is claimed that this process will continue indefinitely, and the supply therefore will be inexhaustible.

BORAX LAKE, HARNEY COUNTY, OREGON.

Since no mining is done during the winter, sufficient material must be gathered during the summer months to supply the full annual capacity of the refining works, which are operated continuously summer and winter. The crude material carries from 5 to 20 per cent boric acid.

CRYSTALLIZING TANKS, BORAX WORKS, HARNE Y COUNTY, OREGON.

The refining process is one of simple determination. The crude borax is thrown into tanks of water heated to a boiling point, into which chlorine or sulphuric acid is introduced. In this heated solution the alkali salts are readily dissolved and the boric acid liberated. The hot solution is allowed to remain in the tanks 24 hours, after which the clear supernatant fluid is run off into recrystallizing tanks where it is allowed to remain until quite cool, when white pearly scales are formed which are washed with cold water before removing from the tanks. The mother solution is reused until sufficient salt has accumulated for separation.

A superior quality of boric acid is produced which commands the highest market price. The annual output of the Oregon works is 400 tons of refined borax. This is shipped by mule teams a distance of 130 miles to Winnemucca, Nevada, a station on the Central Pacific Railroad about half way between Ogden and Sacramento, from whence it is shipped to Chicago and St. Louis. Occasional shipments are made to San Francisco also.

THE AMERICAN INSTITUTE OF MINING ENGINEERS.

The following circular has been issued from the secretary's office in New York:

1. The Proceedings of Part 1 of the Eighty-second (being the Thirty-second Annual) Meeting of the Institute will be mailed next week to members. Part 2 of the same meeting will be held at Philadelphia, beginning Tuesday afternoon, May 13, 1902. Mr. John Birkinbine is chairman of the local committee, and the secretary, to whom all communications concerning the meeting (except as to papers and discussions) should be addressed, is Mr. Edward H. Sanborn, corner of Broad and Chestnut Streets, Philadelphia. Further particulars will be given in a later circular from the Institute office, or in the program of the local committee.

2. In connection with this meeting, opportunity will be afforded for the inspection of modern iron and steel plants, not ordinarily open to visitors; and special attention will be given at the meeting to the subject of the manufacture of iron and steel; one session, at least (to be designated hereafter), being set apart for this purpose. The discussion, at the Richmond meeting, February, 1901, of proposed specifications for steel rails, having not only brought forward, at that time, information of great professional interest, but contributed to a distinct advance in the views and practice of the makers and users of steel rails, it is now proposed to continue the subject by discussing the specifications (1) for steel forgings, and (2) for steel castings, prepared by the American Section of the International Association for Testing Materials. Copies of these specifications will be mailed by the secretary to those who desire to take part in this discussion. Papers on other branches of iron

and steel practice are also solicited, notice thereof to be sent immediately to the secretary. Similar immediate notice should be given of all other papers offered for acceptance and presentation at this meeting.

3. During the current year, two volumes of the *Transactions* will be issued: Vol. XXXI, containing the papers and discussions of the year not directly connected with the mineral resources and industries of Mexico; and Vol. XXXII, containing the papers and discussions so related to Mexico, and constituting a special Mexican volume. Both volumes will be delivered without charge to members and associates not in arrears for dues, but it will be necessary to charge $1 for the binding of each to those who desire to receive it in the usual half-morocco Institute style. Members who have already paid $1 for the binding of Vol. XXXI are hereby requested to remit, in addition $1 for Vol. XXXII, which will otherwise be sent in paper covers. At the time of sending out the bills for annual dues, it was not certain that two volumes would or could be issued in 1902, and, consequently, the item of binding for the extra volume was not stated in the bills. It is believed, however, that members will not object to the petty annoyance of this small extra payment, in view of their receipt, without other additional cost, of two volumes for the year, instead of one.

4. The special volume of the Genesis of Ore Deposits, containing the papers and contributions of Posepny, Le Conte, Van Hise, Vogt, Emmons, Kemp, Lindgren, Weed, Rickard, Blake and others, has been sent to all those who subscribed for it in advance of publication. Hereafter, the price of the volume, including the cost of delivery, will be $6, in cloth, or $7 in half-morocco.

5. The special volume on Mine Surveying Instruments is now in the binder's hands, and will soon be ready for delivery. Immediate subscriptions will still be received at $3 per copy in cloth, or $4 in half-morocco, including cost of delivery, as above. After the issue of the book, these prices will be advanced to $3.50 and $4.50, respectively.

6. The special volume containing a complete and carefully corrected analytical and alphabetical index of Volumes XXVI to XXX, inclusive, of the *Transactions*, is nearly completed. This volume will not be sent free to members. Copies of it can be had by those who subscribe therefor on the blank herewith enclosed, at $1 in cloth and $2 in half-morocco (including cost of delivery). Otherwise, the price will be $1.50 and $2.50.

7. As already announced in Circular No. 1, the price of Volume XXX and each succeeding volume of the Transactions has been advanced to $6 in paper or $7 in half-morocco, including cost of delivery—excepting, however, Volume XXXII (special Mexican volume), the price of which will be $5 in paper, or $6 in half-morocco.

8. As the result of recent enlargement of the Secretary's rooms, members desiring to consult the library (which has now been provided with a complete card-catalogue) can be accommodated with desk-room and other facilities, not heretofore available.

9. The Council has under favorable consideration the plan of a meeting of the Institute in British Columbia, with an excursion to Alaska, occupying parts of August and September, 1903. Cordial invitations have been received from resident members, together with assurances of encouragement and co-operation on the part of the governmental authorities. It is too early to submit, even provisionally, a definite statement concerning this proposed meeting; but the fact that it is contemplated, and, if the present promising conditions and prospects should be confirmed, may be finally approved by the Council, is published for the information of members.

PIG IRON IMPORTS OF GREAT BRITAIN.—Imports of pig iron into Great Britain for the three months ending March 31, were 50,257 tons, of which 3,598 tons were from the United States. For the corresponding period in 1901 the imports were 38,728 tons, of which 24,623 tons were from the United States.

THE WOLVERINE COPPER MINE.

By F. J. Nicholas.

The Wolverine Mine, or the "Little Calumet & Hecla," as it has oftentimes been called, occupies 280 acres of mineral land lying between the North and South Kearsarge properties, and is about three miles north of the Calumet & Hecla. It also possesses the surface rights on 40 acres of land which lie directly east of the main property. Three distinct copper-bearing lodes cross this little tract—the Kearsarge and Osceola amygdaloids and the Calumet conglomerate. The first named is the one on which the mine is opened, as the other two do not underlie enough of the land to warrant sinking shafts. In the ranks of producers, Wolverine has held sixth place for a number of years, and fifth place as a dividend payer since 1899.

This mine was first opened in 1882 by a few local men, but owing to lack of capital the company failed after having mined about 1,000 tons of copper. In 1889 the present organization was effected under the title, Wolverine Copper Mining Company, and the capital stock was increased to 60,000 shares, the present number. Work was started in the fall of 1890, and although the mine began operations during a season of general depression in the copper industry, sufficient money was raised among the shareholders to open the mine and install the necessary surface machinery.

The Wolverine has four shafts, only three of which are now in commission. No. 1 was started very near the northern boundary line and was of no use after having attained the depth of 400 feet. The three shafts now in commission, Nos. 2, 3 and 4, have reached the respective depths of 1,400, 2,100 and 1,800 feet. They are connected one with another by drifts at each 100-ft. level. Shaft No. 2 was the main shaft for a number of years after the mine started, but when No. 3, which is 600 feet south of No. 2, had reached a depth of 800 feet, it was seen that the richest deposit of copper lay in the southern part of the property, and therefore more attention was paid to that part of the mine. Then No. 4 shaft, 1,000 feet south of No. 3, was sunk, and all the rock was brought up through shafts 3 and 4, leaving No. 2 to be used for lowering and hoisting the men.

The underground openings never looked better than at present. Sufficient ground has been opened up to supply the new mill now in course of erection at Traverse Bay for a number of years, and until the latter is completed, to keep the two mills now working fully supplied with rock.

The mills of this mine will be the subject of a future paper; suffice it to say here that the rock from No. 3 shaft is stamped in a mill near the mine, in fact only 1,000 feet distant from the shaft, while the rock from No. 4 shaft is taken to the Allouez Mill, 4 miles distant. The new mill will be ready by next July.

One of the latest contrivances in modern economical mining is the double skip, having two skips in use at each shaft instead of one. When one is at the top the other is at the bottom, and vice versa. It can readily be seen that by this plan much steam power and time are saved. Double skips are used in each shaft.

The surface conditions at the mine present an appearance that would do credit to a much larger one. The buildings are of the best, both in plan and construction; the machinery, the latest and most improved; and last, but not least, the dwellings provided for the employees are commodious and attractive. During the past year five large double houses have been erected, and the year before a handsome residence for the superintendent and also one for the mine physician were built. Altogether there are about 75 company houses and as many private dwellings.

The plant at No. 2 shaft consists of a hoisting engine, with which the men are lowered into and hoisted from the shaft. All the other machinery previously at this shaft has been removed to other parts of the mine. At this end are also located the carpenter, machine and blacksmith shops, and the offices. At No. 3 shaft the plant is made up of an E. P. Allis hoisting engine, 38 by 72 inches, a battery of 3 Crown boilers, and a combination shaft and rock-house, the latter being just completed, but not yet in commission. Steam to run the machinery in the above-mentioned shops is also generated here. The No. 4 plant is composed of a 24 by 48-in. Bullock hoisting engine, a 25-drill Rand compressor, 2 Stirling water-tube boilers, aggregating 400 horse-power, and a combination rock and shaft-house, the latter being one of the finest on the lake.

The rock-houses at both plants are fully equipped with engines, rock crushers, steam hammers, etc., and are in every way prepared to perform the maximum amount of work with the minimum of expense. The fact that the best machinery and material are placed in every part of the mine explains why Wolverine can produce copper at a cost of less than 9 cents per pound laid down in New York. The average product for several years has been 230 tons of mineral per month, running from 87 to 88 per cent ingot copper. It is expected that this output will be doubled when the new mill begins stamping.

The carpenter, blacksmith and machine shops are each equipped with the latest machinery for performing the work in their several departments. Everything is strictly up to date.

The general office is one of the best and most convenient in the copper country. In the basement is the heating apparatus and a storage vault for old books and papers. On the first floor are the clerk's, assistant clerk's and superintendent's offices and vault. On the second floor is the mining engineer's department, consisting of draughting, assaying and blue-printing rooms. The interior work is finished in oak, and the furnishings are in keeping with the general beauty of the building. Opposite the general office are the mining captain's and mine physician's offices, each equipped with everything necessary for the work and comfort of the occupants.

The Wolverine is paying regular semi-annual dividends of $2 per share. Besides this, all the construction work, including the erection of the new mill, is being paid out of the surplus, which has reached over $500,000. The eastern offices of this company are in New York City. Mr. John Stanton, one of America's foremost mining men, is the president, and his son, John R. Stanton, is secretary and treasurer. At the mine Mr. Fred Smith is the superintendent, and to him a great deal of the credit for the present fine condition of the mine is due.

COMPOSITION OF SOUTHEASTERN MISSOURI LEAD ORE.—The galena concentrate which is produced by the mines of the Bonne Terre and Flat River districts in Southeastern Missouri frequently carries a little copper. It is the failure to remove all of that element by the process of refining ordinarily practised in the local smelting works that causes some of the lead to be "chemically hard." At one works the crude lead contains about 0.2 per cent Cu., which is subsequently reduced by refining to 0.02 per cent Cu., the eliminated copper being gradually accumulated in a matte. Sometimes the ore of these mines carries a considerable quantity of copper. An analysis of one car-load showed 62.10 per cent Pb, 0.61 Cu, 3.33 Fe, 5.85 Ca O, 3.08 MgO, 1.39 percent SiO_2 and 1.3 oz. Ag per 2,000 pounds. The results of some other car-loads showed that the aforesaid analysis was by no means unusual. The iron and the copper exist in the ore as pyrite and chalcopyrite. The lime, magnesia and silica represent the gangue of the ore. Calculating the lime and magnesia as carbonates the respective percentages are 10.45 and 6.78, indicating the presence of at least 18.62 per cent of gangue in the concentrate, which was however below the average in its lead content. The ratio between the lime and magnesia in the dolomite of the Southeastern Missouri lead-bearing formation appears frequently to be about 2:1.

A NEW DROP SHAFT.

By ANDRE FOOMIS, E. M., ISHPEMING, MICH.

A great deal has been said about the construction of the drop shafts and of sinking same successfully and quickly through formation of quicksand mixed with boulders and hardpan containing a large flow of water. It is well known that the more water there is present, the more difficult it is to sink a shaft, say, 200 feet to the ledge. Mining men of the Marquette iron region have often paid dearly for their experience in sinking drop shafts. The greatest trouble is caused by the boiling up of quicksand and water, filling the shaft sometimes 25 feet, causing loss of pumps, subjecting the whole structure to great stresses, and entailing considerable loss of time and money.

Experience has shown that when such a shaft, with its beveled bottom timbers, strikes a boulder of a few feet diameter, the great weight of nearly 100 tons per 75 feet of shaft will crush the beveled edge of the bottom set and hold the whole structure there until this boulder is removed. In working to the boulder, the sand around it is often washed in

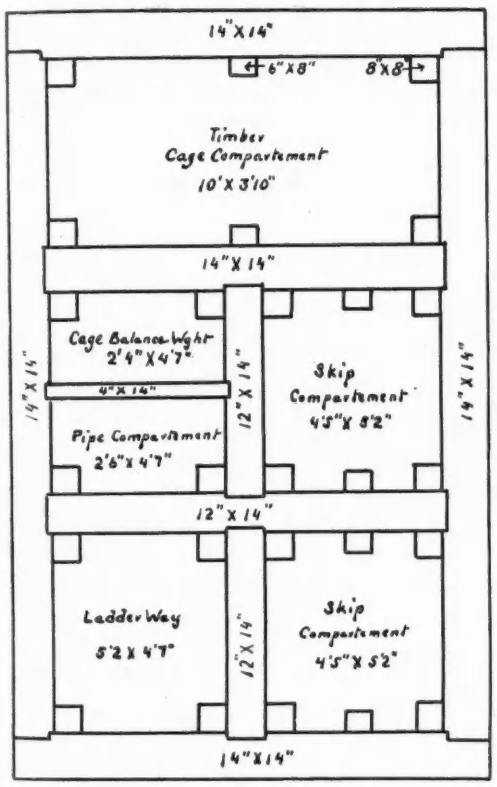


FIG. 1. PLAN OF SHAFT.

quite forcibly, flowing down on the outside of the shaft and up on the inside, filling the bottom. The pressure on the outside becomes unequal, and will cause twisting of the shaft. If such a boulder is large it must be blasted out, thus breaking the bottom timbers and endangering the shaft with the boiling of the sand. Weeks are lost in repairing the damage. Sinking under such conditions has in many instances cost as much as $500 per foot.

Captain Richard Roberts, a miner of wide experience, has designed and constructed a model of a drop shaft which I will briefly describe. The plans will supply any information not given.

The main feature of the new drop shaft is a chisel-shaped steel shoe, bolted to the bottom sets. This shoe will easily cut hard pan, and striking a boulder will either crush it or push it aside. But if too large it can be blasted out with no injury to the bottom sets. When the ledge is struck, the shoes may be taken off, one at a time, and shaft bearers put in their places thus doing away with cutting out the bottom sets of the ordinary drop shaft. These shoes may be used over again in other shafts.

Figure 1 shows the general arrangement of the shaft, providing for two skip roads and ladder way, pipe way, timber way and balance shaft. The shaft is 17 feet 4 inches by 10 feet inside timbers. The first 20 feet to be of oak, the rest of best pine. The shaft sets are bolted together, five sets deep with heavy bolts and the corner pieces 8 by 8 inches, are spliced and bolted to keep the shaft from pulling apart. To lessen the friction of the shaft descending through the sand, the outside may be sheathed with tank steel plates bolted to the sets. Every 15 feet should be a ladder platform, where also three sets of the dividings are left out to give access to the shaft for inspection. The timber cage will be large enough for 9-foot timbers placed horizontally on a truck. An independent track to the cage on the opposite side to the ore-pocket track will permit access at all times to the case, without interfering with the ore cars.

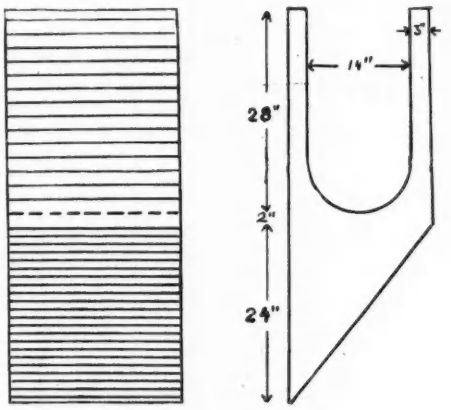


FIG. 2. STEEL SHOE.

Figure 2 represents two views of the steel shoe 64 inches long by 24 inches wide, which is fastened to the bottom sets by 1½-inch bolts. The sides enclosing the timbers are 3 inches thick, the inside being round, gives maximum strength.

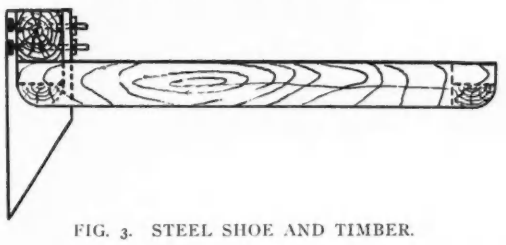


FIG. 3. STEEL SHOE AND TIMBER.

The principle of this shaft is now being made use of in one instance on this range. Any one interested can get detailed information from the writer.

IRON MAKING IN NEW SOUTH WALES.—The *Australian Mining Standard* says: "Mr. Enock James, the expert who recently visited Lithgow, N. S. W., at the instance of Mr. W. Sandford, to inspect and report upon the iron deposits of the western district of New South Wales, has finished his work, and has embarked for England. His impressions are very favorable. He has inspected the several deposits of ore, and has made careful analyses of each of them respectively. The suitability of the Portland limestone for flux and that of the Lithgow coal for fuel have been tested with equal care. Mr. James is of opinion that pig iron suitable for all kinds of foundry work and for the manufacture of steel can be produced in any quantity from the local ores. Mr. James is of opinion, however, that the manufacture of iron and steel could not be profitably carried on in New South Wales without a bonus from the Government for five years at least."

COAL IN IRELAND.—The Board of Agriculture has sent to Glin two experts for the purpose of ascertaining whether coal exists in the neighborhood of the culm pits at Clogough, which sixty years ago were successfully worked by the then Knight of Glin. Three years since, two Scotch mining experts visited the locality and satisfied themselves that anthracite coal was to be found in several places in the vicinity of the old culm workings.

THE ELKHORN MINING DISTRICT, MONTANA.*

By WALTER HARVEY WEED.

The Elkhorn Mining District is in the center of Jefferson County, in the central portion of the mountain region forming the western part of the State of Montana. The town of Elkhorn, picturesquely situated near the head of a mountain valley, 6,500 feet above sea level, lies in the center of the district, 18 miles west of Townsend, on the Missouri River and the main line of the Northern Pacific, about 12 miles east of Boulder, on the Montana Central division of the Great Northern Railroad, about 20 miles southeast of Helena and the same distance northeast of Butte. Crow and Elkhorn peaks rise to an elevation of 9,500 feet only a short distance to the north and northeast of the town, the highest peaks for many miles around.

The ore deposit, known as the Elkhorn Mine, was located as the Halter lode on January 2, 1875, and was worked nearly continuously from that time until November, 1899. In 1882, the mine was idle for the greater part of the time, though it yielded 4,285 ounces of fine silver during that year. The old Elkhorn Company worked the mine down to the 800-ft. level and then sold out in 1888 to the New Elkhorn Company, organized in London. In 1899 the cost of extracting the ore had risen to $15.60 per ton, and the expense of milling had increased to $9.50 per ton. Work was stopped; the pumps were withdrawn; the surface machinery dismantled, and the entire property, including such surface improvements as were of value, was sold early in 1900.

The development of the Elkhorn has played an important economic part in the settlement and development of the State. The former inaccessibility of the district in the heart of the mountains deterred active prospecting for a long time; moreover, in the early years of the Elkhorn Mine, supplies, particularly salt, were very expensive, so that the cost of treatment was heavy. In 1886 the Northern Pacific Railway built a branch to Wickes to get the ore-carrying business of the Alta and the Comet mines. About two years later the marvelous development of the Butte copper deposits induced the railroad company to begin an extension of this branch southward to that city. At the same time the Montana Central, now a part of the Great Northern system, was under construction, and a railway-building contest began, with Butte as the objective point. The Montana Central secured the more favorable right of way, and the Northern Pacific line after being built to Bernice, was not completed to Butte. Both roads pass through Boulder, the county seat, 12 miles west of Elkhorn. A year later the Northern Pacific built a branch line through the Boulder Valley and up the gorge of Elkhorn Creek. Thus a triweekly train service made it possible to ship the silver-lead ores which were found in great abundance in the deep workings of the Elkhorn Mine, and were found, also, to a limited extent, in other properties in the district.

The principal ore body of the district is that of the Elkhorn Mine, which has yielded 8,902,000 ounces of silver, 8,500 ounces of gold, over 4,000,000 pounds of lead, and nearly 7,000,000 pounds of copper. The mine was worked down to the 2,500-ft. level at the time it was closed down. The report shows that the district lies on the border of the great granite area in which Butte, Basin, and other mineral districts occur; that the Elkhorn ore body is a saddle deposit similar to those of Australia, save that it is steeply tilted; the ore occurring in crushed dolomite marble beneath an altered slate hanging wall. The cost of extraction and baseness of the ore caused the shut down in 1900, but the property has since passed into other hands, and an attempt will be made to reopen it. This report is a very full and comprehensive account of one of the great mines of Montana and will be read with interest by all students of ore deposits.

The monthly pay roll of the Elkhorn Mine aggregated over $15,000 for miners, mill hands and wood choppers. The town of Elkhorn, with a population of about 600, was built and maintained practically by

*Abstract of a paper contributed to Part III., of the *Twenty-second Annual Report*, United States Geological Survey.

this one mine, and the supplies shipped to the district for mine and town kept the railroad line busy for many years. The passing into history of this great property is felt not only at the town of Elkhorn, but in the ranches, for whose produce it furnished a market, and in other parts of the State from which it drew supplies. It is, therefore, a matter of great interest that the new owners have decided to reopen the upper levels of the mine and that in May, 1901, they were equipping it with the necessary machinery for operating. With improved facilities for mining and much cheaper smelting rates the mine seems to promise to become a producing property again.

The report of the Director of the Mint for 1884 mentions 12 mines, all close to the Elkhorn, which were said to show well-defined ore bodies, carrying good values in silver, and sometimes in gold and copper. These properties thus far seem to have proved disappointing to their owners and not to have developed into producing mines. An exception should be made of the Elkhorn Queen, situated beyond Queen Gulch and east of Queen Ridge, which has yielded much ore. On the north shoulder of Elkhorn Peak, on the northwest side of the peak, there are two workable deposits of iron ore, now owned and worked by the East Helena smelter to supply a flux for siliceous ores. The Jacquemin mines, in the gulch of Iron Creek, about a mile northwest of the town of Elkhorn, were worked in 1898 to supply low-grade iron ores as flux for the East Helena Smelter; but since the purchase of the above-mentioned properties the Jacquemin has been idle.

UTILIZING BLAST FURNACE GASES IN AUSTRIA

The first plant for the utilization of blast furnace gases in Austria has been installed at the Konigshof Furnace of the Mining Company of Bohemia. The plant consists of a gas engine rated at 300 horse-power, built by the Maschinenbau Actiengesellschaft of Prague. This engine is of the Delamarre-Debouteville type, like those used at the Cockerill Works in Seraing, Belgium. It differs from most of the engines built up to the present time, since the two cylinders are placed in tandem, both pistons being on the same piston rod. The cylinders are 700 millimeters in diameter and 800 millimeters stroke. The engine is run at 150 revolutions per minute, which corresponds to a piston speed of 4 meters per second. The fly-wheel is 4.25 meters in diameter and weighs 22 tons. The motor is coupled directly to a dynamo of the continuous current type.

The gas used has a calorific power of 800 calories to the cubic meter. Its analysis shows 13 per cent carbonic acid; 25.1 per cent carbonic oxide; 1.9 hydrogen; 60 nitrogen. The gas shows, after passing the cleaners, only 0.6 gram of dust to the cubic meter, an amount so small that it has caused no trouble in the engines.

In addition to this engine, which operates the electric plant, the Königshof Furnace has a blowing engine run by blast furnace gas. This engine is of the Cockerill type.

The blast furnaces at Kladno have under construction gas engines rated at 600 horse-power. This will consist of two engine of 300 horse-power each, and will be used to run an electric plant.

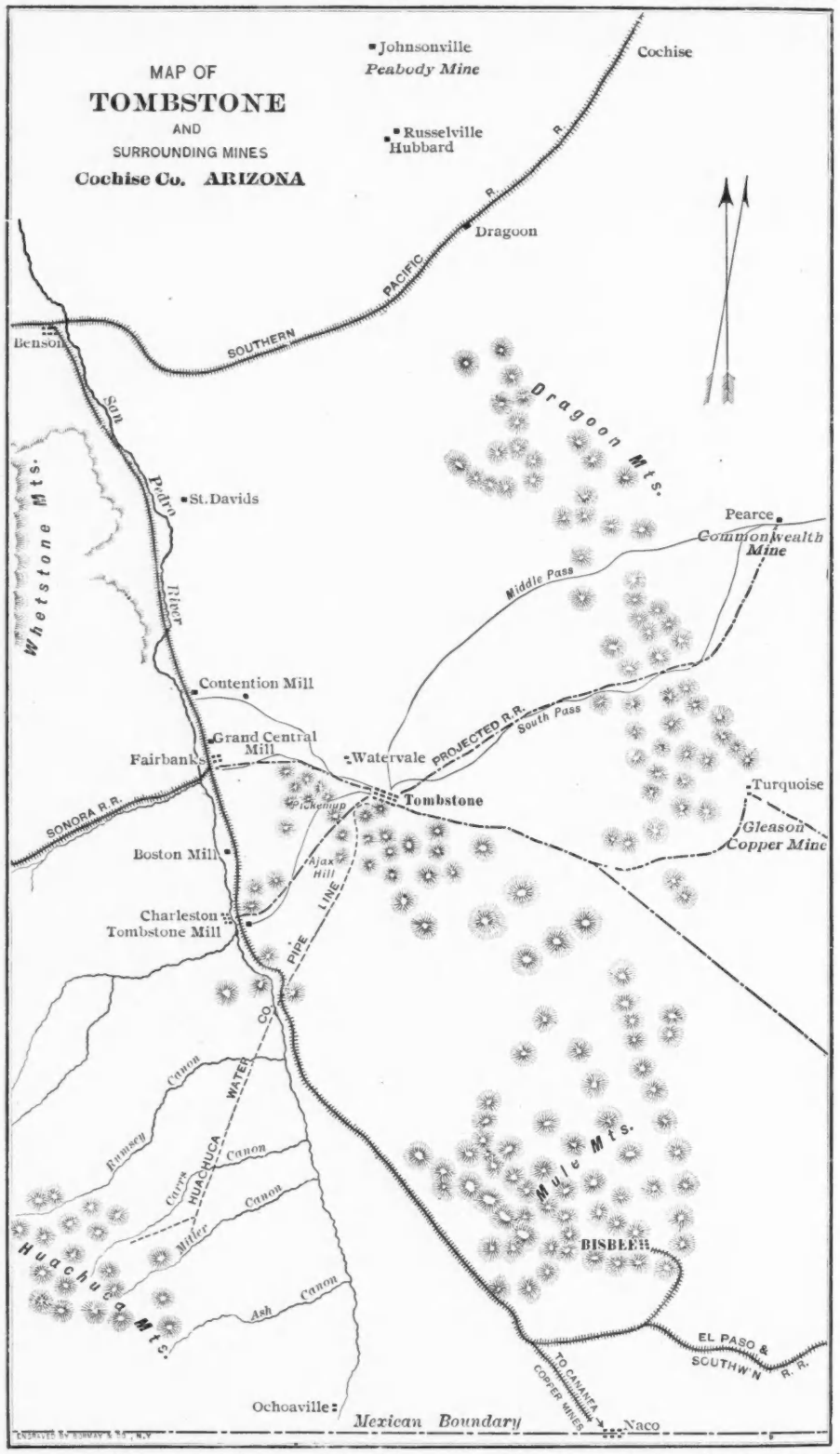
ALUMINUM - MAGNESIUM ALLOYS.—By treating fused mixtures of aluminum and magnesium in various proportions with ammonium chloride solution or dilute hydrochloric acid, Mr. Octave Boudouard has isolated three definite crystalline compounds of the two metals: $AlMg_2$, specific gravity 2.03, from a mixture of 30 parts of aluminum and 70 parts of magnesium; AlMg, specific gravity 2.15, from mixtures of 40 to 50 parts of aluminium with 60 to 50 parts of magnesium, and Al_2Mg, specific gravity, 2.58, from mixtures of 70 parts of aluminium and 30 parts of magnesium. All the fused mixtures of the two metals, except that containing equal parts of each, show dendritic crystals in considerable quantity.

TOMBSTONE, ARIZ., MINING DISTRICT.

By John A. Church.

The accompanying map, on a scale of 1 inch to 6½ miles, illustrates the important mining region in Southern Arizona of which Tombstone is the geographical center. It shows the town of Bisbee near the Mexican line, where the Copper Queen has been mining since 1879 in the interesting deposits which have been described by Dr. James Douglas, and which produced last year 34,382,309 pounds of copper. This will be increased no doubt by a large amount when the Calumet & Arizona and the Calumet & Pittsburg companies build their reduction works. These operations are made possible by the completion of the El Paso & Southwestern Railroad which will enable them to carry their ores by rail to a point where water is more abundant than in Bisbee, the point selected being Douglas, a station just east of the point where the railroad leaves the region shown on the map. Railroad building has been very active in this part of the Territory and the line running through Naco has lately been completed to the Cananeas, while from Douglas a branch runs down to Nacosari. These two Mexican mines represent the greatest results of the search for copper ores which has been so energetic during the past five years. Their ore bodies are large and the superior grade of the ore raises them above the British Columbia mines as sources of copper supply in the future.

Tombstone, with its large output of silver and gold in the past and the intelligent preparations for future work described by the writer in the issue of March 1, is the next important camp in this region. The map shows the railroad system that has not only been projected but authorized for this district. It will not be on a branch, but on the direct through line from El Paso to Benson, as it is the intention of the El Paso & Southwestern to build a cut-off from College Pass, east of the territory shown on the map, through Tombstone to Fairbanks, thus cutting out the long detour by Bisbee. The cut-off may run through the new copper camp of Turquoise and in any event will be very near it. Engineering parties are now in the field to locate the line.



Turquoise has shipped several thousand tons of ore and also has a small smelter for lower-grade ores.

The building of the railroads will undoubtedly be a strong stimulus to mining in this district. The ores of Tombstone have been shipped to smelters for the last 15 years and probably they will seek the same market in the future, no treatment being applied at the mines except upon low grade ores. There is a large supply of low grade manganese and iron-lime ores in the camp which will be of great value as flux to the aluminous ores of the Black Diamond and Middle March groups in the Dragoon Mountains as well as others.

Near Turquoise, or Gleeson, as the copper camp is called, the noted Commonwealth gold mine, with a 40-stamp mill and high grade ore, the most productive of its class in the territory. Just above the Southern Pacific Railroad in the Northern part of the map is the Peabody Mine, now closed but capable of further productiveness.

In the Dragoon Mountains are the Black Diamond and Middlemarch copper mines and the Whetstone and Huachucas are the scene of vigorous prospecting though no important mines have been opened in them. This country covers a series of sedimentary rocks connected with great masses of eruptive granite and at least one extensive surface flow of rhyolite. Altogether the map illustrates one of the most interesting and busy mining fields in the West.

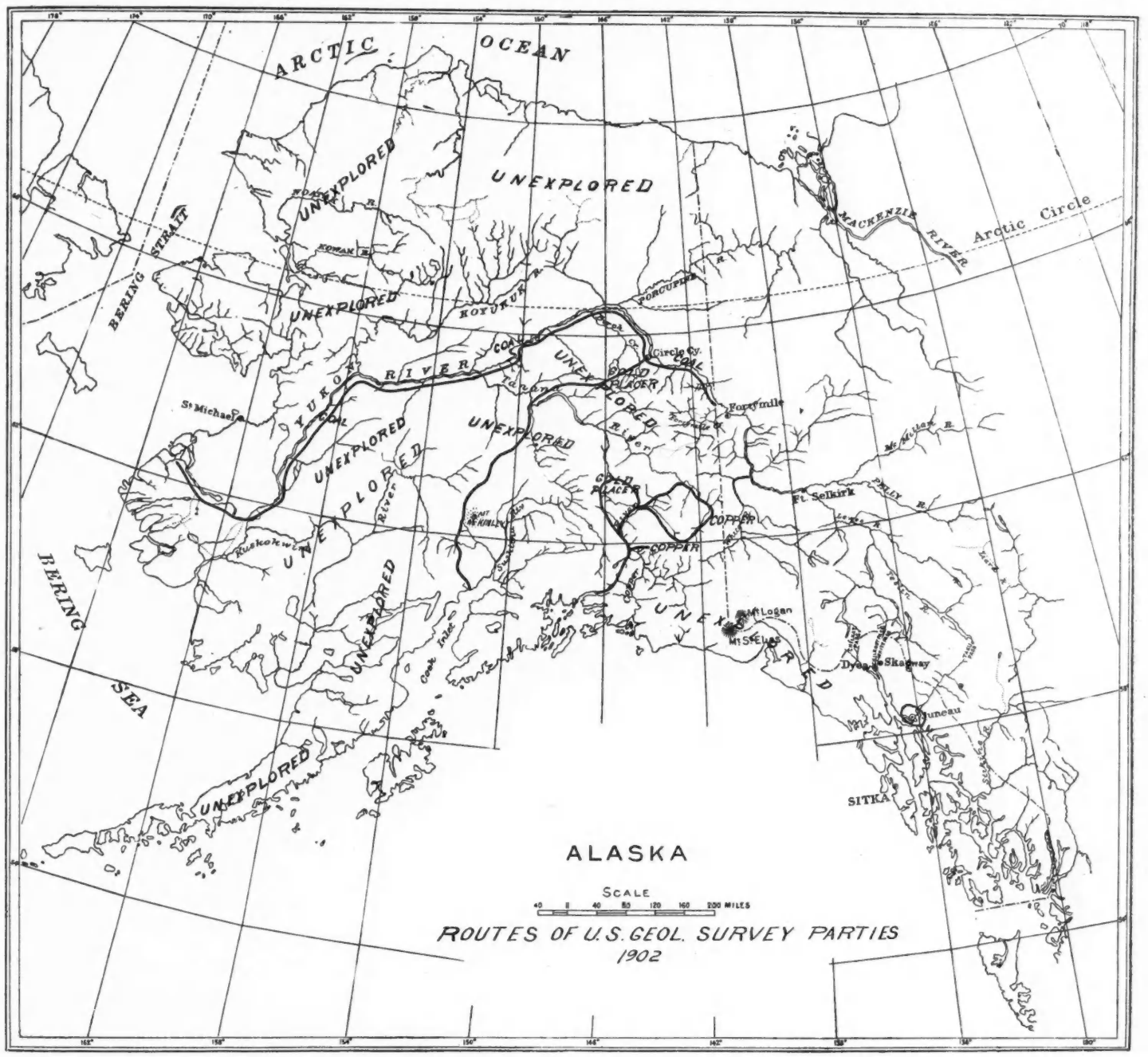
INVESTIGATION OF THE MINERAL RESOURCES OF ALASKA.

SPECIALLY REPORTED.

The production of gold and silver in Alaska during the past year was nearly $8,000,000, while in 1897 it was only $2,500,000. The slight falling off in production compared with 1900 is due largely to the inactivity in the Nome fields, which was brought about by the legal complications which have been so extensively advertised in the daily press.

In view of the development of new and the more systematic working of old placer fields and exploitation of the recently discovered copper deposits, together with the activity in quartz mining in southeastern Alaska, the rate of increase in the value of mineral products during the next five years bids fair to equal that of the past five years. Congress has, therefore, acted wisely in increasing the appropriation for the work of the United States Geological Survey in the Territory from $5,000 in 1897 to $60,000 in 1902. Even this sum, however, is small in view of the fact that the area to be mapped, both topographic and geologic, includes nearly 600,000 square miles, or about one-fifth of the area of the United States. Among the more important mineral resources of Alaska are gold, silver, copper, lead, zinc, marble, coal, and, possibly, petroleum and tin. The deposits of each one of these should be the subject of special investigation, but up to the present time the Geological Survey has been able to make only the most general reconnaissances. Under the present appropriation it is possible to put four, or at most five, parties in the field, and at this rate it will take about twenty-five years to complete the preliminary work.

While there are many demands for work from all parts of the Territory, it has been thought best to spend about half the appopriation this year in the Copper River basin. It is hoped at the close of this season that the reconnaissance of this basin will be completed. The most important results will be more definite information regarding the two copper belts of the region and the Chistochina gold fields. Mr. F. C. Schrader will have charge of the party in the northern half of the region, and will be accompanied by Mr. D. C. Witherspoon, topographer. The



southern party will be in charge of Mr. T. G. Gerdine, topographer, with Mr. Walter C. Mendenhall as geologist. Each party will be equipped with 10 or 15 horses, and will include 5 or 6 camp hands. The provisions have already been transported across the coastal range from Valdes during the past winter, and the party will begin work about the first of May.

Besides the investigation of regions of known mineral wealth, the Geological Survey is attempting the reconnaissance of unexplored regions, both for the purpose of obtaining general geographic and topographic data, and, if possible, of finding new mineral-producing areas. For this reason it is proposed to send a party to explore the northwest slope of the Alaskan Range. The region lying between the head-

waters of the Kuskokwin and the Tanana and Yukon is the largest unexplored area south of the Yukon. Mr. Alfred H. Brooks will have charge of the party, which will include Mr. D. L. Reyburn, toporgapher, and Mr. L. M. Prindle, geologic assistant, and four camp hands. Equipped with 20 horses, the party will land at Tyoneck, Cook Inlet, about May 1. The route will be to the northwest, through the Skwentna Pass, to the Kuskokwin waters; then in a northeasterly direction to the Tanana. Time permitting, the gold fields of the Chena River and Baker Creek will be examined.

As the accessible timber along the Yukon becomes exhausted the coal resources of this region become important. This will be the subject of a special investigation by Mr. Arthur J. Collier, who will be accompanied by Mr. Sidney Paige as assistant. Mr. Collier will also give attention to such of the placer gold fields as are accessible to his route of travel down the Yukon.

In southeastern Alaska, where vein mining requires larger investments of capital, surveys must be of an entirely different character from those of the interior. Maps must be of a large scale and of high degree of accuracy to serve the purposes of the prospector and miner. On account of the timbered condions of this coastal belt such surveys are very expensive. The Geological Survey will begin this work by surveying the important mineral region lying adjacent to Juneau. Mr. W. J. Peters will have charge of this topographic mapping, which will be done on a scale of 1 inch to 1 mile. The resulting map will be used next year as a basis for detailed geologic work.

MINERAL PRODUCTION OF NEW SOUTH WALES.

We are indebted to the courtesy of the Mines Department of New South Wales for an advance summary of the report of the Under Secretary of Mines for the year 1901. Mr. McLachlan says that the aggregate value of the mineral wealth produced in the State to the end of 1901 is estimated at £146,642,167. The value of the production for 1901 was £6,006,636, a net decrease of £564,184 on that of the previous year.

The total number of men employed in and about the mines of the State during the year under review is computed as 36,615, and shows a decrease of 7,130 persons on the year 1900.

The estimated total value of the machinery erected at the mines, other than coal or shale mines, and including the value of dredging plants, is £2,106,776. This is exclusive of the value of the plants of the various smelting companies, nor can the value of the plants at the coal and shale mines be stated at this period.

Gold.—The gold won to the end of 1901 is estimated at 13,475,633 crude ounces, valued at $49,661,815. The total yield for the year 1901 was 267,061 ounces, equal to 216,888 ounces fine, valued at £921,282, as compared with 345,650 ounces (281,214 oz. fine), valued at £1,194,521 for the year 1900, a decrease of 78,589 ounces and £273,239 in value. This is the lowest yield recorded since 1894, but is in excess of any yield previous to that year back to the year 1875. Cobar is still the chief gold producing center, the output being estimated at 42,299 ounces; the production of the next three centers being: Wyalong, 21,717 ounces; Hillgrove, 14,749 ounces; and Araluen, 12,380 ounces. The estimated number of men employed in this industry during the year is 12,064.

In the gold dredging operations a number of satisfactory and payable returns are recorded, but the year's operations have shown that some of the holdings on which plants were erected before a proper examination of the ground was made proved unsuitable for dredging and work has consequently been abandoned. It is pleasing to note, however, that some of the dredges which were erected on unprofitable or unsuitable areas will not be put out of use, but are being dismantled and re-erected on other sites where better returns are anticipated. The gold saved by the dredges during the year amounted to 23,585 ounces, valued at £89,625. In addition to those working for gold, two dredges are working for tin and another dredge is saving tin as well as gold. The number of dredging plants erected or in course of completion at the end of the year was 43 of a declared value of £289,333.

Silver, Lead and Zinc.—The gross value of the metallic contents of the ores raised is not at this date available, but the declared net value of the silver, lead, and zinc exported during the past year was as follows: Silver, silver lead, and ores, £1,854,463; lead (pig, etc.), £100,501; zinc (concentrates), £4,057; a total value of £1,959,021, showing a decrease of £828,429 on the value of the output for the year 1900. The bulk of the output is contributed by the Broken Hill mines, and the fall in the prices of silver and lead practically crippled the industry and caused the closing down of all but three of the principal mines. The drop in values also affected operations at other places where silver mining is follows. The total value of the silver, lead and zinc produced to the end of 1901 is estimated at £32,877,786. The number of men engaged in this class of mining during the year was 6,298.

Copper.—The value of the copper produced during 1901 was £413,302, showing a decrease of £14,734, for which the fall in the market value of this metal is responsible. The output to the end of 1901 is estimated at £8,506,959. The number of men engaged in this industry during the year is set down as 2,964.

Tin.—The production of tin during 1901 is valued at £77,315, which is a decrease of 43,617 on the previous year. Most of the tin is obtained from alluvial deposits, and the severe drought has greatly interfered with washing. The output to the end of 1901 is valued at £10,926,553. The number of men employed during 1901 is estimated at 1,428.

Coal, Coke, and Oil-Shale.—The most gratifying feature in connection with mining during the past year was the sustained activity in the coal trade. The quantity of coal raised during the year was 5,968,426 tons, valued at £2,178,929, being an increase of 460,929 tons and £510,018 in value over the previous year, and is the largest output yet recorded. The number of persons employed in the Northern District during the year was 9,157; in the Southern and Southwestern districts, 2,499; and in the Western district, 535; a total of 12,191.

The value of the coke manufactured during the year was £105,665; this shows a decrease of £3,955 as compared with the previous year, for owing to the fall in the price of metals the demand for this commodity was smaller than in the previous year, and consequently some of the coke ovens were forced to close down. The value of the coke manufactured to the end of 1901 is estimated at £586,391.

The value of the kerosene shale raised during 1901 was £41,489, showing an increase of £20,838 on that of the previous year, which is due chiefly to the activity of the export trade. The total production to the end of 1901 is estimated at 1,073,468 tons, valued at £1,970,623. The number of miners employed getting shale during 1901 was 224.

Iron.—Considerable attention is still being directed toward the question of establishing iron works in this State capable of supplying the requirements of Australia. Two important schemes are being advocated, one to smelt ore at Lithgow from the Carcoar, Cadia, and possibly other deposits in the Western district, and the other to bring ore over the sea from the Blyth River, Tasmania, and smelt it in the vicinity of Sydney or elsewhere upon the seaboard. The indications all point to the fact that extensive iron smelting works will, at no distant date, be established in this State, and employment found for a great number of hands. The value of the ironstone raised for flux during 1901 was £3,765.

Diamonds.—It is estimated that diamonds to the value of £9,756 were won during the past year, the stones obtained have commanded a ready sale, and an increased output is anticipated for the present year. The total production of diamonds to the end of 1901 is estimated at 109,425 carats, valued at £65,291.

Opal.—The output of opal is still confined to the White Cliffs Field, and the value of the production for the year 1901 is estimated at £120,000. This shows an increase of £40,000 on the previous year, and is due to the large number of men who were attracted to the field as the result of the depression in the Broken Hill and Cobar divisions, and it is satisfactory to note that good results have been obtained, and that the field has most opportunely supported a large population.

Other Minerals.—In addition to the minerals already mentioned the value of others raised during the year is as follows: Alunite, £9,438; antimony, £1,183; bismuth, £6,665; chrome, £7,774; cobalt, £1,051; limestone (for flux and lime making), £22,041; platinum, £779; sundry minerals, etc., £125,151; bringing the total value of all minerals for the year 1901 up to £6,006,636.

ZINC AND LEAD IN IOWA.*

By S. W. Beyer.

The production of zinc in the Dubuque region has been reduced to inconsiderable proportions. This has been brought about largely by the sharp decline in the price of zinc, and to a less extent through the exhaustion of the ore bodies in sight. The weak demand and low price have held out no inducements toward the active prospecting and development of new properties as in the year 1898 and 1899. Ore was sold during the year at a price which would not cover the cost of production, let alone yielding a reasonable return to the operator. The entire output for the Iowa field scarcely reached 350 tons, principally carbonate—dry bone—and sold at an average of $7.70 per ton. The most select stock sold for $12 per ton, yielding fair returns to the labor and capital employed, while certain low-grade ores were disposed of at $5 per ton, entailing a considerable loss to those concerned. Almost the entire output was shipped to Mineral Point, Wisconsin. La Salle, Illinois, may be considered as a competing market, but rarely affords active competition. The two largest companies remained practically closed or were only worked in a desultory way on account of legal complications.

The Alpine Zinc Company has abandoned the old workings, at least temporarily, on account of water, but has sunk a new shaft on the same vein several hundred yards to the westward, which promises well. A good body of high grade ore is in sight, and will be marketed as soon as the price warrants.

The zinc industry in the Dubuque region gives little promise for the future unless prices strengthen materially. The plant of the Dubuque Ore Concentrating Company lay idle during the year because of the intermittent and insufficient supply of crude ore and the general decadence of the industry.

The falling off in the demand for zinc has not materially affected the demand for lead. Most of the energy and capital formerly occupied in the development of zinc properties is now devoted to the opening of lead properties. Prospecting has been vigorously prosecuted during the past year, and several rich bodies of mineral have been brought to light. The demand ruled firm and the price steady throughout the year, and those employed in the production of lead ore were able to secure good returns for their labor and capital. Practically all the ore produced was galena and all of it was sold to the local smelter, owned and operated by William G. Waters of Dubuque. The ore smelted during the year amounted to 1,500,000 pounds, purchased at an average price of $23 per thousand pounds, and cleaning up an average of 72 per cent lead.

The production of zinc and lead for Iowa may be recapitulated briefly as follows: Zinc, 350 tons, value $2,700; lead 600,000 pounds, value $13,800; total value $16,500.

The lead smelted in the Waters smelter was 1,500,000 pounds, contributed by the following States: Iowa, 600,000 pounds; Illinois, 700,000 pounds; Wisconsin, 200,000 pounds. The total value was $34,500.

*From the *Iowa Engineer*, March, 1902.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

CONSTITUTIONALITY OF LAW REQUIRING COAL TO BE WEIGHED BEFORE IT IS SCREENED.—The law of Arkansas (Act of 1899, page 165) requiring a coal mining corporation engaged in mining and selling coal by weight to weigh it before it is screened, does not abridge the right of a laborer to contract; and he cannot complain that the powers of the corporation are limited and less than those of a natural person. Nor is it unconstitutional as restricting the power of a corporation to contract.—Woodson v. State (65 *Southwestern Reporter,* 465) Supreme Court of Arkansas.

REQUIRED LABOR ON MINE MUST BE "REALLY WORTH" $100.—Under the laws of the United States (Revised Statutes, Section 2324) permitting miners of each mining district to make regulations, not in conflict with the laws of the United States, etc., governing the amount of work necessary to hold possession of a mining claim, and providing that until a patent has been issued therefor, not less than $100 worth of work shall be performed each year, 20 days' work, which according to an arbitrary rate allowed for same by a regulation of a local mining association, would amount to $100, is insufficient to hold a mining claim for one year, unless such work is really worth $100.—Woody v. Barnard (65 *Southwestern Reporter,* 100); Supreme Court of Arkansas.

QUESTIONS AS TO NEGLIGENCE IN MINING OPERATIONS FOR THE JURY.—One employed in a coal mine, while in the discharge of his duty was riding on a train of cars being drawn out of the mine, when the cars jumped the track, and while running to a place of safety he was struck on the head by a broken piece of timber projecting from the roof and injured. Witnesses testified that the timbers were decayed and there was testimony that each of several of the timbers there were marked unsafe, and the injured man testified that prior to this day he had called the attention of the superintendent to them. It was shown on behalf of the operator that the cars in jumping the track had displaced the upright timbers supporting the roof, and it was claimed that no notice of defects had been given. The court on appeal held it was a question for the determination of the jury.—Webster v. Monongahela Consolidated Coal and Coke Company. (50 *Atlantic Reporter,* 964); Supreme Court of Pennsylvania.

One who was working under an elevated railroad track was struck by a piece of ore falling from the car above as the engine was moving along the trestle. The ore had fallen from the brake-beam of a car, where it had probably lodged when the ore was being dumped into the car. The employees had been notified not to lay any ore on the trestle where it could fall on the men below. It was held on appeal that the question of whether the employee had been furnished with a safe place in which to work was for the jury.—Virginia Iron, Coal and Coke Company v. Hamilton (65 *Southwestern Reporter,* 401); Supreme Court of Tennessee.

DUTY ON IRON SHEETS OR PLATES.—Sheet iron valued at more than 3 cents per pound is subject to duty at 45 per cent ad valorem, under paragraph 193, and to the additional duties of 0.2 cent per pound, provided in paragraphs 133, respectively, according to whether the article is cold rolled, smooth only, not polished, or whether it is galvanized, or both.—Treasury decisions 22929 and 23333 cited and followed.—Circular of Treasury Department.

DUTY ON BOILER FLUES AND FURNACES.—Welded, corrugated, or ribbed, iron and steel cylinders, so called, invoiced as "boiler flues" or "Purve's ribbed steel boiler flues," must be returned for assessment of duty at 2½ cents per pound, as "welded cylindrical furnaces, made from plate metal," under the second clause of paragraph 152, act of 1897, and not at 2 cents per pound as "boiler tubes," "pipes," or "flues" not thinner than No. 16 wire gauge, under the first clause of said paragraph.—Circular of Treasury Department.

ABSTRACTS OF OFFICIAL REPORTS.

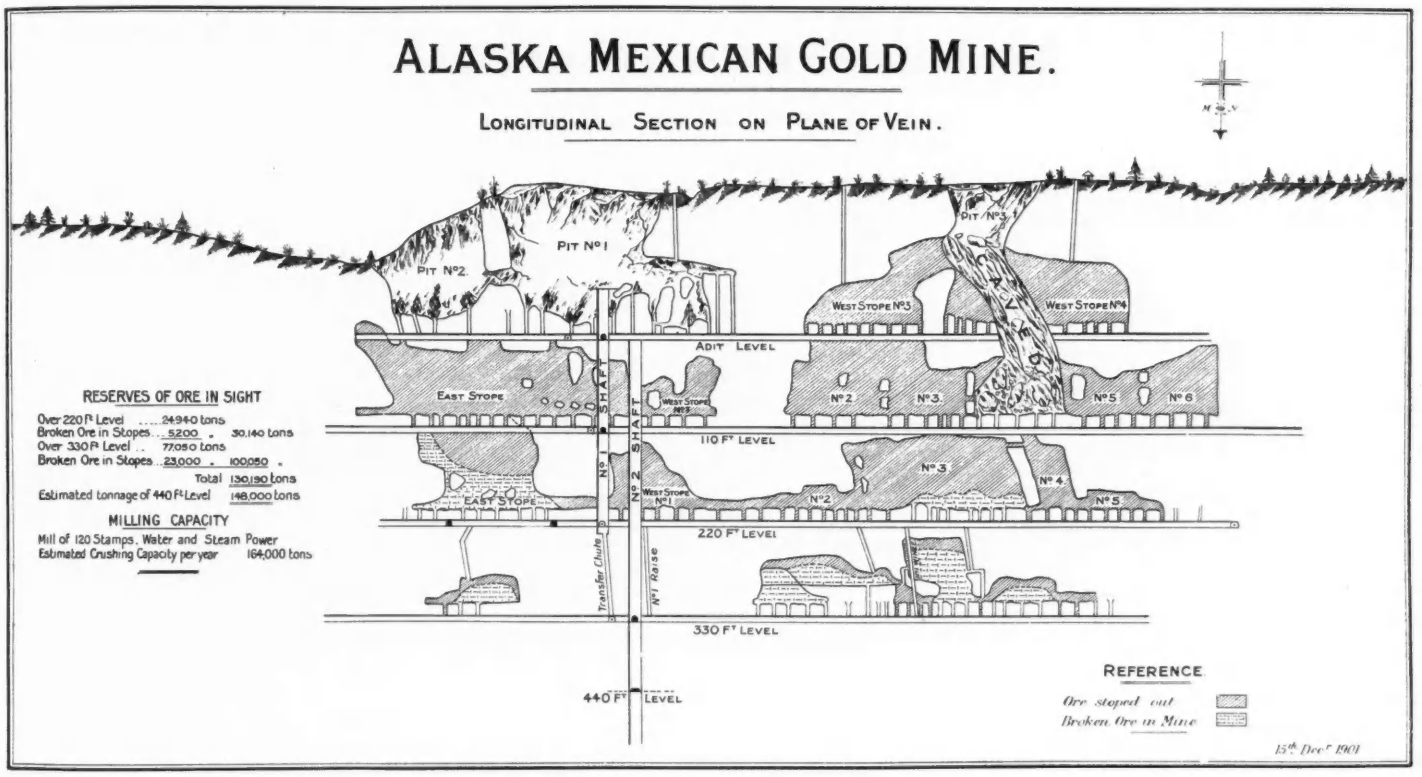
Alaska Mexican Gold Mining Company, Alaska.

This company owns a large property on Douglas Island, Alaska. The capital stock authorized is $1,000,000, of which a total of $900,000 has been issued. The net profit for the year, as shown in the table below, was $24,709; balance brought forward from previous year, $11,796; total surplus at the close of the year, $36,505.

Owing to a change in the method of keeping the accounts, the bullion receipts are for only 11½ months, while the expenses are for the full 12 months. The ore treated in the mill was 178,960 tons, and 3,194 tons of sulphurets were saved from the tailings by concentration. The earnings and expenses for the year were as follows:

	Total.	Per ton.
Yield in free gold from mill	$213,923	$1.1968
Yield sulphurets treated ($39.30 per ton)	125,529	0.7000
Total gold	$339,452	$1.9968
Mining and developing	$213,371	$1,1923
Milling and concentrating	53,839	0.3008
Treating sulphurets	25,372	0.1418
General expenses, Douglas Island	4,234	0.0237
San Francisco office	2,283	0.0127
London office	479	0.0027
Paris office	51	0.0003
Consulting engineer's expenses	888	0.0049
Bullion charges	1,987	0.0111
Total working expenses	$302,504	$1.6903
New construction	12,239	0.0684
Total expenses	$314,743	$1.7587
Net earnings	$25,709	$0.1381

The total development work done during the year was 5,441 feet, chiefly on the 330 and 220-foot levels. The ore taken out was 178,960 tons, of which 29,532 tons—16.5 per cent—were obtained from development work. The ore in sight and available for the mill on December 31, 1901, was 130,190 tons; in addition to which there is an estimated amount of 148,000 tons on the 440-foot level. The condition of the mine is shown on a map accompanying the report, which we reproduce herewith.



The mill of 120 stamps ran for 337 days, 11½ hours, using water-power 148 days, 10½ hours, and steam 189 days, 1 hour. The average duty was 5.79 tons per stamp per day, against 4.92 tons in the previous year. The repairs included 300 shoes, 325 dies and 191 stems broken and replaced. The mill has been thoroughly overhauled; a bin for sulphurets added and a tramway built to carry off waste rock.

The report of Superintendent Joseph McDonald says: "The barge *Colorado,* loaded with sulphurets from the Douglas Island Mines, went ashore in Wrangel Narrows on April 22, 1901, resulting in a loss to the Douglas Island properties of over $18,000. Of this amount the Alaska Mexican Gold Mining Company's proportion was $3,911. The *Colorado* was being towed to the smelter at Tacoma, Wash., and in passing through Wrangel Narrows the pilot of the tug boat lost his bearings and ran the barge on a reef. It was impossible to float the vessel, and nothing remained but to discharge her cargo into sacks, which were subsequently sent to the smelter in steamers. The barge was owned by R. Dunsmuir & Sons, Victoria, B. C., and our direct loss was the sulphurets and the expense of recovering them. Indirectly it has been a very expensive accident to

us, inasmuch as we were left with but one barge to transport our sulphurets in bulk to Tacoma. We have been compelled since April, by lack of barge transportation, to ship a large portion of our concentrates by steamers, at double the barge freight rate, and on account of not being able to get steamers to take our product when we wanted them were often compelled to sack a large tonnage, which is also an extra expense we would not have had to stand had the wreck not occurred. I estimate the extra expense we have been put to on this account to be $1,696. Dunsmuir & Sons have purchased another barge to put into this business, to be in commission in less than a month. For the coming year, therefore, we can look for a corresponding decrease in the cost of handling our sulphurets.

"Four accidents occurred during the year, of which two were fatal. Of the fatal accidents, one occurred by a miner going into an abandoned stope and falling into a chute, and the other was caused by a slab of rock falling from the roof of a stope, both men being killed instantly. Both accidents were caused by carelessness on the part of the deceased, as the first mentioned had no right in the abandoned stope, and the last mentioned had been taken away from the dangerous place by the shift boss but went back again. Of the other two accidents, one man was badly bruised, but is again at work, and the other sustained a broken arm caused by fall of rock.

"I find that in order to keep the mine properly developed and the mill running on a good grade of ore, it will be necessary to run from 15 to 17 machine drills per shift of 10 hours. Our air compressor only has a capacity of from 10 to 12 drills, and we are therefore somewhat handicapped by lack of compressed air power. At the present time we are buying air from the Alaska United Gold Mining Company sufficient to run four drills, for which we are paying them at the rate of $5 per machine per day of 24 hours, or $20 per day for the four machines.

"By comparing the mill record, month by month, for the year, you will note an increased duty, per stamp, for the last few months. For the first eight months of the year it was difficult to find sufficient ore to keep the mill running, but as soon as the 330-ft. level was opened up we had plenty of ore for the mill and began to increase the tonnage. I hope to put 18,000 tons of ore through the mill per month hereafter, or a duty of 5 tons per stamp per day. If the ore bodies hold out on the 440-foot level, as they have on the upper levels, this output can be maintained, and the outlook is good for a resumption of dividends."

Boston Quicksilver Mining Company, California.

This company's report for the year 1901 shows receipts follows: Net proceeds of sales, $54,159; quicksilver on hand, $14,310; increase in supplies, interest, etc., $4,172; total, $72,641. The expenses were $86,428, showing a deficit of $13,787. Deducting surplus from previous year, a debit balance of $9,033 remained at the close of the year. There was expended for construction and repairs to property $11,626, which was charged to expense account.

New Idria Quicksilver Mining Company, California.

This company's report covers the year ending December 31, 1901. The total receipts for the year were: Sales of quicksilver, $211,484; increase in supplies, $104; interest, $416; total, $212,004. The total expenses were $155,649, leaving a net balance of $56,355. The dividends paid were $60,000, leaving a deficit of $3,645. The balance brought forward from previous year was $44,574, and the surplus at the close of the year was $40,929.

There was expended for construction and repairs on the property during the year and charged to expense account $40,883, and there was expended on the San Carlos plant $10,602. Timber purchased charged into plant account amounted to $17,400.

Central Mining Company, Michigan.

This company's report for the year 1901 shows that expenses at the mine were $19,174; office expenses and interest $1,042; total, $20,216. Rents received were $432, leaving a balance of $19,784. Adding a debit balance of $3,369 from preceding year, an indebtedness of $23,153 remained at the close of the year.

The directors' report says: "At the time of writing our last report, it seemed advisable to continue exploration work by sinking a shaft at a proper point to a depth that would be well below the overburden, and then to crosscut the formation. With the advent of Spring weather, a party was employed in test-pitting at various points in search of a convenient location for such a shaft or of favorable points for boring with a diamond drill, and in view of the quantity of water met with and other conditions, it was finally decided that an exploration by use of diamond drill would be more expeditious, would involve much less expense, and therefore cover more ground in the same period of time and with a given amount of money than by the method at first proposed. A complete diamond drill outfit with boiler on wheels was therefore procured, and boring was begun early in November. Up to this time no deposit of value seems to have been met with, but the work is proceeding and it is proposed to make this exploration as thorough as practicable.

"An assessment of $2 per share ($40,000) on the capital stock, was levied, payable January 15, 1902, for the purpose of liquidating the indebtedness, and providing means for continuing the exploration named."

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.

British Columbia of To Day—Bulletin No. 2, Bureau of Provincial Information. By Hon. J. H. Turner, Agent-General. Victoria, B. C.; Public Printer. Pamphlet, 16 pages.

Skeena River District and Bulkley Valley Settlement. Bulletin No. 3, Bureau of Provincial Information. Victoria, B. C.; Public Printer. Pamphlet, 16 pages.

City of Providence, R. I. Annual Report of the City Engineer. Otis F. Clapp, City Engineer. Providence, R. I.; printed for the City. Pages, 82; illustrated.

City of Minneapolis, Minn. Annual Report of the City Engineer or the Year 1900. G. W. Sublette, City Engineer. Minneapolis, Minn.; printed for the City. Pages, 96; illustrated.

Gradation for Mine Management. By Myles Brown. Wigan, England; Thomas Wall & Sons. Pages, 112. Price (in New York), 75 cents.

Sumpter Gold-fields, Oregon. Their History, Mines and Opportunities. By Charles Liebenstein. Sumpter, Oregon; published by the *Blue Mountain American.* Pages, 48; illustrated.

Safety Appliances and Accident Reports. From the *Fifteenth Annual Report* of the Interstate Commerce Commission. Washington; Government Printing Office. Pages 76.

State of Michigan. Nineteenth Annual Report of the Bureau of Labor and Industrial Statistics. Scott Griswold, Commissioner, Lansing, Mich.; State Printers. ages, 540.

The British Railway Position. By George Paish. With an introduction by George S. Gibb, London, England; reprinted from the *Statist.* Pages, 336. Price (in New York), $2.50.

Sixteenth Annual Report of the United States Commissioner of Labor. Strikes and Lockouts. 1901. Carroll D. Wright, Commissioner, Washington; Government Printing Office. Pages, 1,054.

Common Errors in the Determination of Silica. By W. F. Hillebrand. New York; reprinted from the *Journal* of the American Chemical Society. Pamphlet, 12 pages.

Logarithmic Tables of the Measures of Length. Extending from 0 to 50 feet, at intervals of 1-16 inch. By Thomas W. Marshall. New York; *Engineering News* Publishing Company. Pages, 106. Price, $2.

BOOKS REVIEWED.

Easy Lessons in Mechanical Drawing and Machine Design. By J. G. A. Meyer and Charles G. Peker. In two volumes. New York; the Industrial Publication Company. Volume I, 406 pages; Volume II, 274 pages; illustrated. Price (for both volumes), $10.

The author of this book had much practical experience as a draftsman in construction shops, and, it may be presumed, thus acquired a good, general idea of what a student needs to fit him for shop work. In these two large volumes he has given a large number of illustrations of the design of various tools and machines and of the general and detail drawings necessary in the shops where they are constructed. These illustrations are generally good, though we think the author is inclined to put too much unnecessary work—such as shading and the like—upon his drawings. The sections on the design of machines are generally elementary, but will be useful to students, and are perhaps as far advanced as was required by the general design of the work. The mechanical execution of the volumes—including the engravings, text and printing—is very good, and the student who tries to repeat or reproduce the drawings given will do well if he can approach their excellence. The rules, formulas and tables given are generally practical and useful.

The Mineral Wealth of the Black Hills. Bulletin No. 6, South Dakota School of Mines. By Cleophas C. O'Harra. Rapid City, S. Dak.; published by the School of Mines. Pages, 88; illustrated.

This monograph describes briefly the economic mineral deposits of the Black Hills in South Dakota, and includes also a general summary of the history, conditions and apparent possibilities of their development. The structural materials and water resources are not included, as they are to be reviewed in a separate paper. The information given is based largely upon personal inspection and field work, but free use is made also of the work of previous writers. After a brief introduction and condensed chapters on the general geology and history of the district, the mineral products are taken up in succession. Gold is, of course, the chief one and has the greater part of the space given to it. The list includes also copper, iron, manganese, silver, lead, tin, tungsten, graphite, mica, spodumene, and some minerals of minor importance. The writer seems to claim the existence of tin in the region, notwithstanding past experience. The book closes with a statement of recent production and a brief account of the present conditions which affect mining. It is illustrated by a number of half-tone reproductions of photographs, and by several geological sections.

The monograph is a serviceable one, containing in a condensed form much information about a rich and interesting region. It has evidently been prepared with care and with a view to giving the latest facts in a brief and readable form.

Review and Test of the American Standard Specifications for Steel, Adopted by the American Section of the International Association for Testing Material. By Albert Ladd Colby. Second Edition, Bethlehem, Pa.; published for the Author. Pages, 104; with diagrams.

The author in his introduction refers to the first attempt to standardize specifications for steel in America, which was made by the Association of American Steel Manufacturers in 1895. These specifications were criticized, but gradually met with approval, as the advantages of standards were appreciated. The American Section of the International Association for Testing Materials was formed in

June, 1898 and early in the next year began the work of preparing the standard specifications which were given in this book. These have been fully discussed at two meetings of the American Association, and have been approved and adopted by ballot of the members. They were presented, with the German and French standard specifications at the meeting of the International Association at Budapest, in September, 1901. At that meeting a committee was charged with the duty of considering the question of preparing international specifications; this committee is to report at the next meeting, which will be held at St. Petersburg in 1903. This, briefly is the history of the specifications which are submitted to the public in this book.

The full text of the specifications, as given in the book, includes those for steel castings; steel axles; steel forgings; steel tires; steel rails; steel splice-bars; structural steel for buildings; structural steel for bridges and ships; open-hearth boiler plate and rivet steel. It will be seen that they cover the ground almost completely. This text is preceded by a review of the requirements of the specifications, with statements of the reasons which influenced the committee in making its different decisions. The reasons are discussed in detail, so that every reader can understand not only the requirements made, but the reasons why they were made, and why they were approved by the experienced engineers who composed the committee.

As these specifications will doubtless become the accepted standards for this country, it would be well for every maker and user of steel to understand them and become familiar with them. Mr. Colby has therefore done good service in putting them in an easily accessible and convenient form, and in adding the discussion, which is a valuable part of the work.

CORRESPONDENCE.

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

Buyers of Molybdenum and Chrome Ores.

SIR:—We have noticed upon several occasions in your replies to correspondents through your "Questions and Answers" column, names of concerns who purchase molydenum, chrome and other special ores, in which our firm was not included. For your information, and also for the information of the readers of the ENGINEERING AND MINING JOURNAL, we beg to state that we have been handling chrome ore for upward of 50 years, and are large buyers of molybdenum ores. We are also buyers of vanadium ores.

GEO. G. BLACKWELL SONS & CO.

Liverpool, England, April 8, 1902.

A Uniform Monetary Standard.

Sir: Mr. Johnston's note with regard to the letter of A. C., on the subject of a uniform monetary standard has a certain amount of force and pertinence. Of course there will always be differences of exchange, as long as commerce is carried on among nations, and there are trade balances and variations in demand for money, and consequently in interest rates. Such variations exist in our own country, and there are frequently exchange differences as between New York and Chicago, San Francisco, etc. This, it seems to me, would not affect the value of the proposed reform. On all transactions involving exchange the calculations would be very much simplified; and on the great amount of business where rates of exchange do come in the gain would be very great. I agree with Mr. Johnston that bankers ought to welcome such a change. If they would exert their influence for it—instead of against—it would be carried out.

We are all in favor of promoting trade and intercourse among nations. Would not anything which tends to promote such trade and make it easier be a benefit to the world? J. F. R.

New York April 20, 1902.

Silver in Africa.

Sir: Allow me to propound a question not only to your able journal, but also to its readers in all parts of the civilized world. In any considerable deposit of silver ore known to exist in Africa?

A few words may suggest the propriety and importance of the interrogatory. Africa has been noted for its gold deposits from the most remote times. In the North the ancient Egyptian mines, in the South the old diggings of Mashona land, give evidence of great production in the past and greater in the future. The washings of the natives caused a large region of West Africa to be called the Gold Coast, and the ledges from which the gold came are still untouched. From the interior caravan trade, gold was brought as early as the times of Herodotus. In the course of a few years these sources of supply will be opened. The Transvaal will resume its activity, and that may be but a drop in the bucket. Before long Africa will lead the world in gold production; and may surpass the rest of the world combined. On the other hand, so far as my information extends, Africa is as barren of silver as North America is of tin. In some regions the natives have mined copper in large quantities. Almost everywhere they have mined iron. They have mined silver nowhere. Is it there?

If my conjecture is correct an important change is about to occur in the ratio of production of the two metals. It was long ago shown by Adam Smith that the ratio of production and the ratio of values of gold and silver do not strictly correspond. Still no one can doubt that there is a tendency toward a rough correspondence.

GEO. W. SHAW.

Geneseo, Ill., April 18, 1902.

The Metric System in the United States.

Sir: The recent report of the committee on weights and measures of the House of Representatives in favor of the pending bill for the adoption of the metric system in the United States called forth in your issue of March 22 a reiteration of your indorsement of that proposal. Your views upon this subject are well known to your readers. Permit one of them to inquire, however, if you have fully considered all the results that would follow such a change; it is assumed that the pending bill, with the provisions of which I am unacquainted, contemplates a change, inasmuch as the metric system is already legal in the United States and any law that would lead to the co-existence of two systems, by permitting the survival of the old one, would only be a step from bad to worse. Such an unfortunate contingency would be warded off only by making the old system illegal, allowing of course a fair time in which to make the multitudinous alterations that would be necessary.

The advantages of the metric system are obvious; it is a pity that the United States and the other English speaking nations do not enjoy them. There can be no difference of opinion on that ground. The only material difference of opinion I conceive, is as to the expediency of its adoption at this late date. It was introduced generally in the European countries, which use it, during the early part of the last century. Commerce and industry had not at that time attained a great development. It should have been adopted in Great Britain and the United States then, or at least previous to 1860. It was feasible to introduce it in Mexico almost at the end of the nineteenth century, because Mexican industries were even then in their infancy. Very likely it could now be put into effect in Russia without causing grave consequences. But the results that can be directly foreseen of forcing it upon the English-speaking countries, industrially the greatest of all countries, may well cause us to hesitate and consider if the advantages to be gained are likely to be worth the cost.

All of our past work and construction is based upon feet and pounds. Our experience falls back upon the same measures. Our manufacturers have an enormous capital in their drawings and patterns. The people at large have a vast outlay in appliances for weighing and measuring by the existing system. Consider for a moment what would be the cost of replacing our weighing scales with new beams, if not in whole; or our yard sticks. What would be the the expense of refiguring our working drawings and substituting new patterns and how would it be done? Would an inch pipe for example become a 25.4 millimeter, or would we become tired of remembering such odd figures and establish new standards? The latter would be unthinkable; the former would be highly awkward, if not impracticable. Reflect upon the bearing a change to the metric system would have upon the everyday experience of the American mechanic and the people at large; the carpenter knows how many nails of a certain size go to the pound; how many square feet of one inch board can be laid in a day's work; the mason knows how many standard brick are required for a cubic foot of wall and can estimate the cost of laying on that basis. Has this all to be relearned, or has the mechanic to carry a pencil and pad of paper to make the conversions? Our books of reference would remain as printed. Should we have to buy new editions, or should we have to resort to individual mathematics? Take for example Trautwine's pocket-book, and consider how much its value would be diminished if our present system were abandoned; consider the cost of converting its tables and what it would amount to if every engineer who now owns a copy of it had to buy a new one. Reflect upon the expense that would fall upon thousands of manufacturers in bringing out metric catalogues, and revising the valuable and frequently indispensable engineering tables that many of them contain. The more questions of this kind one asks himself, the more convincing becomes the idea that the introduction of the metric system in any way, save as a natural and gradual development, would be but little short of a national calamity.

On the other hand what would be gained? International business would be facilitated no doubt; so it would also by a uniform system of decimal coinage; but who can say to what extent? We appear to be expanding our foreign trade rapidly enough, in spite of our present system. Oftentimes the metric system is sufficiently labor-saving to lead engineers to make their computations by it and convert back the results to English weights and measures. In general, however, we do fairly well with the English system alone, which is capable of a good deal of decimalization and is frequently used in that manner. However, this is not to argue against the superiority of the metric system.

I dare say that the objections herein raised to the adoption of the metric system by the United States were urged in other countries when the change was made. My point is simply that the price to be paid has increased in about the same ratio as the increase in knowledge, experience, and industrial capital, and appears now to be too high. There may be no danger that the pending bill will pass this Congress, in spite of the favorable committee report, since the efforts of manufacturers, who consider that their interests would suffer, have defeated bills of almost equal promise at previous sessions, but on the other hand there is the chance that it may slip through. It is to be hoped, however, that the matter will at least receive the most careful consideration, because it is one that affects the interests of the whole people in many vital ways. It would therefore appear to be wise to reinaugurate a serious discussion of it in the press, which is the only way to arrive at the popular opinion of such a subject. Such a discussion should be directed toward throwing light upon the practical results of an adoption of the system and leave aside

the academic arguments that it is more scientific and convenient in use than our existing system, which we all admit. J. B. R.

New York, March 31, 1902.

QUESTIONS AND ANSWERS.

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

Jaspar Magnetic Separator.—Do you know of this separator? Can you tell me if it is in use anywhere?—C. S. V.

Answer.—We are informed that the Jaspar system of magnetic separation is in use at the works of the Vieille Montague Company at Angleur, Begium.

Cost of Niagara Falls Power Plant.—Can you tell me what it cost to develop the 50,000 electrical horsepower at Niagara Falls?—J. H. M.

Answer.—Careful inquiry and examination fails to show the cost of the Niagara Falls power plant. No general statement has been made by the constructors or managers of the plant. Descriptions of the work have been published, but fail to give even the approximate total cost.

Openings for English Mining Engineers.—What mining camp in the United States would you advise a young Englishman, with technical education in mining, assaying and surveying, to proceed to next July? Used to underground work and prepared to take the first job that offers.—W. W. C.

Answer.—The openings offered in this country to a young man willing to work and to learn are so many and varied, that it is impossible to indicate or recommend any one camp. A great deal depends on the line which the young man wishes to follow—whether coal, iron, lead, copper or gold, for instance. His decision on this point would determine whether it would be best for him to try Pennsylvania, Ohio or Illinois; Missouri, the Lake Superior country, Montana, Colorado, California, or some other State. In all will be found active mining districts and opportunities for work.

Cold Blast Pig Iron.—Have you a work on hand that will give me any information of the process of making cold-blast pig iron? If not could you tell me if there have been any papers published on the subject and where I might secure them? I would also like to get the names of some plants where this process is in work.—C. H. H.

Answer.—We have no special book or paper on making cold-blast iron. Such information on the subject as can be obtained is given in the works on iron smelting and metallurgy, such as those of Greenwood, West and others.

Comparatively little pig iron is now made in this country with cold-blast. Those furnaces using it are chiefly charcoal furnaces which make special brands for car-wheels and similar purposes. Among these may be mentioned some in the Hanging Rock region in Ohio; the Vesuvius Charcoal Iron Company, Gray, Lawrence County, O.; the Hecla Iron and Mining Company, Hecla, Lawrence County, O. There are a few charcoal furnaces in Central Pennsylvania using cold-blast—the Eagle Iron Company, Roland, Center County, Pa.; the Logan Iron and Steel Company, Burnham, Mifflin County, Pa.; McCoy and Linn, Milesburg, Center County, Pa. The Lobdell Car Wheel Company, Wilmington, Del., owns and controls several furnaces using cold-blast. The use of hot-blast in coke furnaces is almost universal, there being very few exceptions.

The Cyanide Process.—I would esteem it a great favor if you would tell me the name of the man to first introduce cyanide; also if the American Cyanide Company of Denver can claim a royalty on all ore that is worked by the cyanide process and if parties wishing to erect cyanide mills must obtain permission from that company.—F. U. H.

Answer.—To answer fully the questions given would involve a discussion altogether too long for this column. The first use of cyanide and its introduction in a practical commercial process were treated by Dr. Henry Wurtz in *The Mineral Industry*, Volume V, and by Mr. Louis Janin, Jr., in *The Mineral Industry*, Volume I. You might consult also Bosqui's *Cyanide Practice*.

As to the patent question it is a matter for the courts to decide. Broadly speaking, there is no patent which can cover the use of cyanide solutions for dissolving gold in ores. There are, however, many patents on various methods of applying it, and on details of the process, such as the recovery of gold from solution, which are valid. The right of any patent owner to prevent the operation of a cyanide mill would depend upon the special methods used in that mill. Upon this point your best course is to consult an expert.

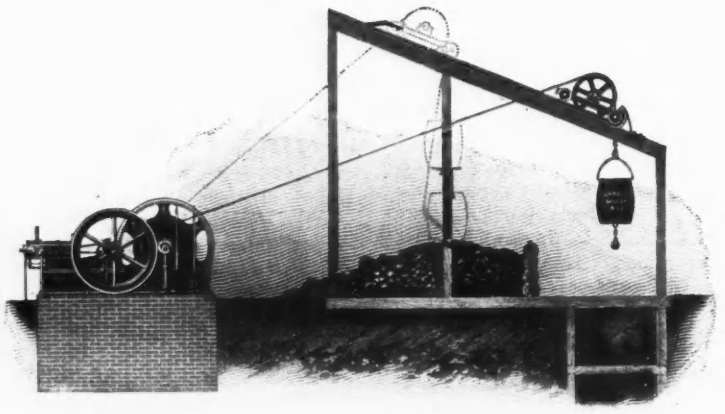
FAIRBANKS-MORSE AUTOMATIC ORE DUMP.

The automatic ore dump illustrated herewith constitutes an improved method of dumping ore buckets. This device accomplishes the dumping of the bucket in a simple, reliable manner. It also obviates the possible danger of the bucket falling back into the shaft, and disposes of the man ordinarily required for dumping the bucket.

It will be noticed from the illustration that the cable runs over a movable sheave instead of the customary fixed sheave used in the ordinary gallows frame. With this device, when the bucket reaches the proper position the carriage or trolley carrying the sheave moves up the track, which is inclined, until it is caught by the hook, as shown by the dotted lines. The movement of the trolley up the incline with the bucket is arranged to land the bucket on the platform, as shown on the middle upright post. This platform is provided with a slot into which the chain on the bottom of the bucket passes. Then by releasing the clutch mechanism of the hoist the drum is allowed to slacken the cable, and the platform on which the bucket rests automatically dumps. The bearings carrying the platform being off of the center, the weight of the bucket immediately overbalances the dump as soon as the hoist is lowered. The ball on the end of the chain, attached to the end of the bucket, holds the bucket while it is being dumped. When the bucket is empty the hoist again pulls it back until it reaches its trolley, when the hook which holds the trolley and bucket puts it back in its position over the shaft, and the bucket is lowered. This arrangement permits the setting or adjusting for various positions of the shaft and hoist, and the dumping into different compartments, while by means of chutes under the control of the man at the hoist, or by the use of tram cars, the dump can be placed at almost any desired point.

By using the Fairbanks-Morse automatic ore dump in connection with the Fairbanks-Morse gasoline hoisting engines, one man can perform all the overhead work, including tool sharpening, hoisting, dumping and tramming.

It will thus be seen that a saving of one man ordinarily used for dumping buckets is made. At the same time the liability to accidents which frequently occur from running the bucket into the sheave is much reduced, and much less time is required in this operation than is necessary to dump the bucket by hand.



FAIRBANKS-MORSE AUTOMATIC ORE DUMP.

No more timber is required in constructing the gallows frame than would be used in the common frame.

Further information on working or drawings of this outfit will be cheerfully supplied by the makers, Fairbanks-Morse & Co., Chicago.

PATENTS RELATING TO MINING AND METALLURGY

UNITED STATES.

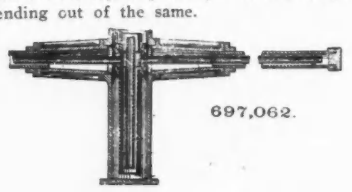
The following is a list of patents relating to mining and metallurgy and kindred subjects, issued by the United States Patent Office. A copy of the specifications of any of these will be mailed by the Engineering and Mining Journal upon receipt of 25 cents.

Week Ending April 8, 1902.

696,923. MACHINE FOR FORMING BARS OR SIMILAR ARTICLES.—Wilhelm Baisch, Stolberg II, Rhineland, Germany. In a machine for forming bars or similar articles by pressing plastic metals simultaneously through dies, a press-cylinder open at both ends, two dies working in opposite directions to each other and capable of entering said press-cylinder to act upon the plastic metal from opposite sides, and ducts in said dies arranged at points between the perimeter and the rod of each die through which the forming articles simultaneously leave the inside of the press-cylinder.

696,941. MANUFACTURE OF ARMOR-PLATE.—Georges Charpy, Montlucon, France, assignor to Compagnie des Forges de Chatillon, Commentry et Neuves-Maisons, Paris, France. An armor-plate of steel containing about 5 per cent of nickel and from 0.1 to 0.15 per cent of carbon cemented on one face only, and hardened at a temperature of about 750° to 800° C. without subsequent annealing, whereby after hardening the cemented face has a porcelain-like texture and hardness, and the remainder of the mass has a non-fissile texture.

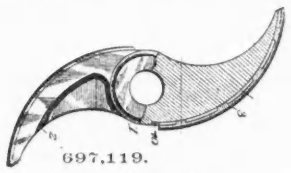
696,987. FURNACE.—John MacCormack, Bayonne, N. J., assignor to Royal C. Peabody, Brooklyn, N. Y. In a furnace, the combination with an air-supply box, of a hollow perforated rotable tuyere partially surrounded by said box, but extending out of the same.



697,062.

697,062. ROASTING-FURNACE.—Lewis T. Wright, Keswick, Cal. The combination, with a series of floors, of a central hollow shaft, hollow arms carried thereon over the respective floors, an open-bottomed pipe inserted in said shaft, a second open-bottomed pipe in said shaft into which the first pipe discharges intermediate to said first pipe and

shaft, open-ended pipes leading from the intermediate pipe into the hollow arms, and feed and exhaust pipes connected to the first pipe and hollow shaft.



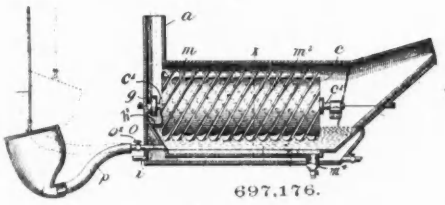
697,119.

697,119. CAM FOR STAMP-MILLS.—James C. H. Vaught, Phillipsburg, Mont. A cam provided with dovetailed recesses, and a shoe having lugs or enlargements arranged on its inner face and detachably interlocked with the dovetailed recesses.

697,138. PROCESS OF TREATING METALLIC SULPHIDES.—Antonin Germot, Asnieres, and Henri E. L. Fievet, Paris, France. A process for the conversion of sulphides into sulphates consisting in subjecting them to the action of ozonized air by holding them in suspension in a liquid in the presence of an acid and blowing a current of ozone into the liquid.

697,157. ELECTROLYTIC APPARATUS.—Frank McDonald, Rumford Falls, Me. The combination of a metallic tank, spaced perforated metallic plates electrically connected with the tank and subdividing the tank to form anode and cathode compartments, asbestos diaphragms lining said plates, a layer of acid-proof cement covering the inner surface of the bottom and end walls of the tank between the diaphragms, a cover hermetically sealing the anode compartment, a cover sealing the cathode-compartments, positive electrodes carried by the cover to the anode-compartment, and negative connections to the plate and the tank.

697,171. COMPRESSED-AIR-WATER-ELEVATOR.—James R. Ricketts, Kingfisher, Okla., assignor of one-half to George W. Wilson, Kingfisher, Okla. The combination with a water vessel, of an air-pipe connected therewith, a liquid-discharge extending from the lower portion of the vessel, an escape pipe extending from the upper portion of the vessel, an inlet-valve having a stem extending upwardly therefrom, and an escape-valve movable simultaneously with said inlet-valve and adapted to reciprocate upon said stem to close said escape-pipe before the seating of the inlet-valve.



697,176.

697,176. AMALGAMATING-MACHINE.—Gerard C. Scott, Columbus, Ohio. The combination with a casing having an inlet-opening at one end and outlet-opening at the other, of an amalgamating-body rotatably supported within said casing and adapted to run in a body of mercury contained within the casing, of a pipe-section leading outward from the body of mercury, a mercury reservoir or holder, means for raising said holder to a higher level than said pipe section and lowering the same to a level below that of said pipe-section and a flexible connection between said outlet-pipe and reservoir.

697,177. AMALGAMATING-MACHINE.—Gerard C. Scott, Columbus, Ohio. The combination with a casing having inlet and outlet openings, said casing adapted to contain a body of mercury in the lower portion thereof and rotatably mounted independently arranged ore-pulp conductors within said casing, said conductors being so arranged as to insure one of their ends being retained at a higher plane than the opposite end during their passage through the lower arc of their revolutionary cycle, and amalgamating material within said conductors.

697,178. APPARATUS FOR THE TREATMENT OF ORES.—Eliel L. Sharpneck, Chicago, Ill. As a means for facilitating the dissolving of the values in ores, the combination of a leaching-tank, a conduit leading from and discharging directly into the tank, and means in the conduit connected with a heating-medium supply for agitating, circulating and heating the liquid contents of the tank.

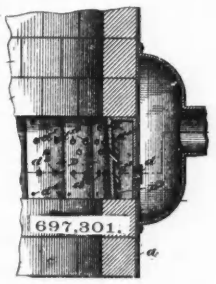
697,213. APPARATUS FOR MAKING IRON OR STEEL.—Eduard Meininghaus, Dusseldorf, Germany, assignor to Joseph Leinberger, Darmstadt, Germany. In a furnace for producing wrought iron or steel direct from the ores in combination with a crucible having an opening in its enlarged top, a self-closing valve upon said opening, a screw-spindle guiding said valve, an outlet-pipe near the upper end of the crucible for letting out slags and also molten metal from the crucible, an opening at the bottom of the crucible, said opening communicating with two channels, the first one of which serving for opening or closing said opening by a plug at the end of a spindle passing through said channel, the other one, serving for letting out fluid metal out of the crucible or for blowing air and gases into the crucible.

697,234. FUEL BLOCK AND BRIQUETTE.—Francois Chailly, New York, N. Y., assignor to Standard Briquette Company, a corporation of New Jersey. A fuel block or briquette composed of comminuted fuel and a binder containing as ingredients calcium sulphate, sodium silicate and dextrine.

697,244. TOOL FOR MAKING, MENDING, AND SHARPENING ROCK DRILLS.—Gilbert J. Glossop, Leeds, England. The combination of a holder or block having a vertical opening through it and an opening through the front side, a bottom die having a vertical recess with parallel sides and inclined bottom chisel-forming faces and taper-side forming faces inclined in the opposite longitudinal direction to the incline of the faces and a top die having chisel-forming faces, taper-side forming faces inclined in the opposite longitudinal direction to the incline of the faces and edge-forming surfaces co-operating dies and fitting freely in the said vertical opening.

697,249. BLAST-FURNACE.—Gerard P. Herrick, New York, N. Y. Apparatus for preventing escape of dust from blast-furnaces, comprising in combination with the furnace and concentric hopper and an outwardly-directed stock-distributer situated at the top of the furnace, a dust-chamber situated between the stock-line and the offtake-pipe enlarged transversely to the direction of natural flow of the gases and prolonged upwardly, said dust-chamber opening downwardly and freely into the furnace below the hopper, and an offtake-pipe leading to a place of use and situated at such distance from the stock-line that the particles of dust to be retained in the furnace shall be checked before reaching said offtake-pipe.

697,296. COMPRESSED-AIR WATER-ELEVATOR.—George R. Tyler, Pomona, Cal. In a compressed-air water-elevator, an eduction-pipe having its bore diminished in diameter from its intake to its discharge end, and means disposed below and spaced from the lower end of the pipe for discharging a current of air concentrically of the pipe.



697,301.

697,301. TUYERE FOR CUPOLA-FURNACES.—Stewart Watt and Forrest H. Watt, Barnesville, Ohio; said Forrest H. Watt assignor to said Stewart Watt. In a cupola-furnace, a series of tuyeres adapted to form part of the lining of the cupola, each consisting of a hollow body having an air-inlet in its back and its inner or front end open, and a removable changeable face or front plate secured to and closing the inner end of each body, each plate being provided with jet-apertures.

697,307. PREPARING ASPHALT.—Augustus Wolskel, Kew, Victoria, Australia. In the preparation of asphalt, roasting sand grit or particles of silicious or like matter at not substantially less than 800° F., cooling the mass to its normal temperature, then reheating to about 350° F., and mixing therewith melted bitumen or asphaltum until each particle is completely coated.

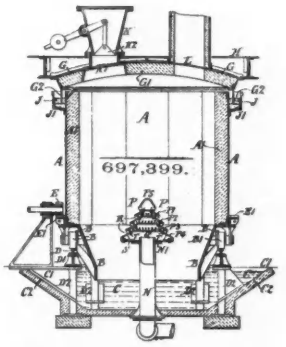
697,311. DRIVE MECHANISM FOR CRUSHING-ROLLS.—Alfred M. Acklin, Pittsburg, Pa. The combination with a driving-shaft, and a crusher-roller geared directly therewith, of a second roller, yielding means for pressing said second roller toward the other roller and permitting it automatically to recede therefrom, as described, and gearing connecting said second roller directly with said driving-shaft and comprehending and endless belt and a tension-regulator for said belt, said tension-regulator serving automatically to take up slack in said belt when the second roller approaches the other and yielding automatically to the pull on said belt when said second roller recedes from said other roller.

697,319. PROCESS OF MAKING DOLOMITIC SANDSTONE.—Herman E. Brown, Coldwater, Mich. The process consists in calcining the alkaline earths contained in dolomite, hydrating the calcined product, mixing with silicious combination, and molding and heating the mixture.

697,351. ORE-SEPARATOR.—James M. McClave, Frank H. Kirby and Ernest R. Cumbe, Denver, Colo. An electromagnetic ore-separator, comprising opposite electromagnets, a drum of non-magnetic material movable between the poles of the magnets, projecting pole-pieces on one of the magnets, a carrier movable over the lower magnet, a hopper adjacent to and discharging directly onto said carrier, and bands of magnetic material supported on the drum.

697,353. APPARATUS FOR SCREENING CRUSHED ORES OR OTHER MATERIALS.—Walter McDermott, London, England. In a screening device, a main tank subdivided into reception and discharge chambers separated by a screen, the chamber below the screen being closed against inflow of water except through the screen, the upper chamber being provided with a restricted discharge-pasage on a level with the upper surface of the screen and leading into a water-chamber, a water-supply for said water-chamber adapted to maintain a head of water therein substantially the same as that in the main tank, so as to prevent interflow, a discharge for the water-chamber, a separate discharge in the main tank for the slimes and water which have passed through the screen, and means for feeding the material under treatment into the chamber above the screen and for causing it to move thereon.

697,370. PROCESS OF TREATING COPPER-NICKEL-SULPHIDE ORES.—Darius P. Shuler, Sudbury, Canada. The process of treating ores containing nickel-iron sulphides with copper-iron sulphides, which consists in subjecting the comminuted ore to magnetic separation so as to produce therefrom headings and tailings, the headings being richer in iron and sulphur than the tailings, but generally poorer in nickel; thus bringing about, by the magnetic separation, a variation or readjustment of the relative proportions of iron and nickel, so as to produce the proportions which are proper for the making of nickel-steel, then roasting the headings, and finally smelting them to produce pig-iron containing a proportion of nickel which makes it suitable for the direct manufacture of nickel-steel.



697,399.

697,399. GAS-PRODUCER.—Edward J. Duff, Liverpool, England. Improvements in gas-producers comprising a rotating shell or casing the contour of the internal surface of which is polygonal in plan, the shell having a lower depending piece dipping into a water-sealed ash-trough, the upper end of the shell or casing being closed by a cover suspended from the charging-platform, a depending annular plate on the cover dipping into a liquid seal in a trough encircling the top end of the casing.

694,414. AIR-COMPRESSOR.—Frank L. Reeder and Albert B. Freville, Louisville, Ky., assignor to the National Foundry and Machine Company, Louisville, Ky., a corporation. In an air-compressor, the combination with a taper threaded valve-chamber, having an annular interior groove, and a passage connecting chamber and cylinder, of a taper-threaded double, valve-seat bushing, having a projecting threaded end portion, the valves in said bushing, the perforated jam-nut engaging said projecting portion of the bushing, and the threaded plug engaging a threaded opening in the end wall of the valve-seat chamber.

GREAT BRITAIN.

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

Week Ending March 22, 1902.

4,231 of 1901. OIL-BURNING FURNACE.—J. Ward, Newcastle-on-Tyne. A furnace for metallurgical purposes, heated with oil fuel.

5,235 of 1901. GAS PLANT.—P. Naef, New York, U. S. A. Plant for obtaining a gas from bituminous fuel free from tar and ammonia.

6,857 of 1901. ELECTROLYZING ZINC CHLORIDE.—J. Swinburne and E. A. Ashcroft, London. In the process for electrolyzing fused zinc chloride, submitting the chloride to a preliminary electrolysis, so as to get rid of the water.

7,397 of 1901. SODA PRODUCTION.—A. Brochet and G. Ranson, Paris, France. An electrolytic process for producing sulphur and soda from sulphide of soda.

7,921 of 1901. PURIFYING GRAPHITE.—H. Langbein, Dresden, Germany. Removing silica from graphite by treating the ground graphite with ammonium, fluoride and sulphuric acid and recovering the fluorine by taking the silicon fluoride produced to ammonia water.

8,752 of 1901. COPPER PRECIPITATING TANK.—A. Berry, Leeds. An improved tank for precipitating copper from solutions obtained by treating burnt cupreous pyrites.

22,834 of 1901. ELECTRIC ROCK-DRILL.—H. D. Crippen, G. S. Maxwell and G. White, New York, U. S. A. An electric percussive rock drill with motor encased.

25,596 of 1901. BLAST FURNACE.—C. J. Rader and E. E. Smeeth, Chicago, U. S. A. An improved water jacket blast furnace.

25,788 of 1901. MINER'S SQUIB.—H. J. Richards, Wilkes-Barre, U. S. An improved squib for blasting purposes.

26,689 of 1901. HOT-BLAST STOVE.—G. Teichgraeber, Marchienne-au-Pont, Belgium. Improved plant for heating air for blast furnaces.

1,146 of 1902. SULPHIDE ORE TREATMENT.—C. V. Potter, Victoria, Australia. Treating fine ground sulphide ores with a weak solution of sulphuric acid and heat, so causing metallic compounds to float on the surface and separate from the gangue.

PERSONALS.

Mr. James I. Long, manager of the Hidalgo Mining Company, Parral, Mex., is in California.

Mr. A. L. Wisker has left Sedalia, Mo., where he spent the winter, and is now at Tonopah, Nev.

Mr. Willard F. Snyder returned to Salt Lake, Utah, last week after a 5 weeks' visit to Eastern cities.

Mr. R. A. Campbell, of the Miocene Gold Mining Company, at Harpers, B. C., has been in Rossland, B. C.

Mr. M. W. Dinchester, representing the Ingersoll-Sergeant Drill Company, at Salt Lake, Utah, is in Arizona.

Mr. Solon J. Vlasto, a leading New York importer of minerals, has been in Washington, D. C., on a short vacation.

Mr. Charles Davies has gone to West Africa, where he will be assistant manager of the Ashanti Gold Corporation.

Mr. Victor M. Braschi, engineer and contractor of the City of Mexico, is spending a few days in San Francisco, Cal.

Mr. F. R. Thomas, secretary of the San Francisco Mining Company, of San Francisco, has been in Los Angeles, Cal., on business.

Mr. A. F. Wuensch, mining engineer of Denver, Colo., is at present in New Mexico, engaged in the examination of copper properties.

Mr. N. F. Leopold, of Chicago, Ill., general manager of the Arcadian Copper Company, recently visited the mine near Hancock, Mich.

Mr. Pablo Vermehren, of Torreon, Mex., is on a trip to Germany via New York City. He will probably return about the middle of August.

Mr. Philip Argall, of Denver, Colo., has gone to Mexico on professional business. He expects to be absent from Denver about two months.

Mr. Victor Beutner has severed his connection with Julian Kennedy, of Pittsburg, to become consulting engineer for Sprang, Chalfant & Company.

Mr. J. G. Rower, of Chicago, Ill., a traveling representative of the Pressed Steel Car Company, recently visited the Michigan copper district.

Mr. W. C. Watson, assistant superintendent of the Osceola Mine in the Lake Superior copper district, has left on a two-months' tour of Europe.

Mr. Kasaku Asano, of Tokio, Japan, a representative of the Ashio Copper Company, has been at Clifton, Ariz., investigating methods of treating copper ores.

Mr. Irving M. Palmer, of Pueblo, Colo., has accepted the position of chief chemist for the Durango, Mex., plant of the American Smelting and Refining Company.

Mr. J. G. Puterbaugh has resigned his position as assistant general sales-agent for the Missouri Pacific Coal Companies of St. Louis, Mo., and this office has been abolished.

Mr. Henry Coates, of Perth, Scotland, has been inspecting the Haseltine group of claims near Central City, Colo., in company with Mr. William Weston, his consulting mining engineer.

Mr. William Watts and a crew of 15 carpenters, who have been constructing a gold dredger at Wheatland, Cal., have gone to Sonora, Mex., to remain about 4 months, constructing dredgers.

Mr. Robert D. Evans, of Boston, Mass., president of the United States and Centennial-Eureka mining companies, was in Utah recently visiting the Bingham and Tintic holdings of these two organizations.

Mr. Hugh Caldrowood, who has been manager of the Collingwood Shipbuilding Company of Ontario, has accepted the position of manager of the Risdon Iron and Locomotive Works of San Francisco, Cal.

Governor F. W. Hunt, of Idaho, has been in New York City stopping at the Waldorf-Astoria. It is stated that Gov. Hunt is interesting capital in a large concern to operate in the Thunder Mountain District.

Mr. J. Madill has resigned as superintendent of the Cochran Mining and Milling Company, at Lead, S. Dak., to take up the management of his own properties. Mr. C. D. Ridgeway, late of Telluride, Colo., succeeds him.

Mr. Glenn R. McClintock, assistant superintendent of the yards of the Illinois Steel Company, Joliet, Ill., has resigned to accept the position of superintendent of all the yards of the Crucible Steel Company of America, of Pittsburg, Pa.

Mr. Harris K. Masters, who has had charge of the converter department of the Nichols Chemical Company at Laurel Hill, N. Y., has gone to Bingham Junction, Utah, to take charge of the new smelter of the United States Mining Company.

Mr. J. S. Jones, of Chicago, Ill., president of the Jones & Adams Company, the Catlin Coal Company, and the Millers Creek Coal Company, has been in the East for the past week on business in connection with the various companies he represents.

Mr. W. H. Crawford, who has been superintendent of Ella Furnace of the Lacey-Buek Iron Company, at Trussville, Ala., has resigned, and has accepted a position as manager of the Hillman Land and Iron Company, at Grand Rivers, Ky.

Mr. E. H. Williams, formerly general manager of the blast furnaces of Pickands, Mather & Company, at Sharpsville, Pa., and West Middlesex, Pa., will have charge of construction of the new blast furnace to be built by Pickands, Mather & Company at Toledo, O.

Mr. Leslie Hill, consulting mining engineer, of Vancouver, B. C., has been appointed consulting engineer and manager of the Hastings (B. C.) Exploration Syndicate, which operates the Arlington Mine at Erie and other properties. Mr. Hill will make his headquarters at Nelson, B. C.

Mr. J. Z. Risch, of Delft, Holland, a recent graduate of the electrical engineering course of the American School of Correspondence, Boston, Mass., has been appointed instructor in electrical drawing and design in a technical school at Leyden. Mr. Risch is also a graduate of the American School's marine engineering course.

Mr. Montagu T. Barney, mining engineer of London, England, is in San Francisco, Cal., where he has placed with the Risdon Iron Works of that city, an order for one of its largest dredging plants to be shipped to the West Coast of South Africa. After installing this plant Mr. Barney will visit Madagascar.

Mr. R. F. Maroney, formerly general superintendent of the Baltimore & Ohio Railroad has been elected vice-president of the Pittsburg, Shawmut & Northern Railroad Company. He will also have charge of the interests of the Shawmut Mining Company, which owns 50,000 acres of coal and coaking lands located in Elk, Clearfield, Jefferson and Armstrong counties, Pa.

Mr. Isidor Davidov in consequence of the virtual end of the revolution in Colombia, and the bright outlook for gold mining in that country, will leave New York City May 3rd, taking a large quantity of machinery with him to the Santa Barbara Mine in the Department of Antioqua for additional development and working of some new mines in the vicinity, which promise to be unusually rich.

Mr. Reuben Miller, of Pittsburg, chairman of the executive committee and treasurer of the Crucible Steel Company of America, will retire from active participation in the affairs of the company on May 1 on account of ill health. The chairmanship of the executive committee being largely an honorary position will probably be abolished. Mr. Julius Bieler, assistant treasurer, will succeed Mr. Miller as treasurer.

Mr. Charles E. Finney, formerly manager of the Consolidated Kansas City Smelting and Refining Company, for two years general manager of the smelting and mining interests of M. Guggenheims' Sons and for the past year a member of the managers committee of the American Smelting and Refining Company, New York City, has severed this connection and associated himself with Mr. Benjamin Guggenheim in various enterprises.

Lord Kelvin, one of the most prominent inventors and electrical experts of our time is on a visit to this country. A reception in his honor was given at Columbia University on April 21. The reception was arranged jointly by Columbia University, the American Institute of Electrical Engineers, the American Association for the Advancement of Science, the American Physical Society, the American Mathematical Society, the Astronomical and Astrophysical Society of America and the New York Academy of Sciences. Dr. Francis Bacon Crocker, past president of the American Institute of Electrical Engineers, who presided, presented Dr. Nicholas Murray Butler, who made the address of welcome for the university.

Prof. Elihu Thomson, for the American Institute of Electrical Engineers, saluted the guest as the father of electrical engineering, and said that nearly all of the progress of the last 25 years had been due to Lord Kelvin's theories, work and calculation. Dr. Arthur Gordon Webster spoke for the American Physical Society, and Dr. Robert Simpson Woodward for a number of societies, including the New York Academy of Sciences.

OBITUARY.

Col. W. H. Hoskins, president of the Union Bank, of Knoxville, Tenn., and also of the Elk Valley Coal and Iron Company, died suddenly April 18 of heart disease at his home. He was 63 years of age.

George R. Bentley died at his home in Oskaloosa, Ia., from dropsy on April 18 aged 70. He was one of the builders of the Iowa Central Railroad, was largely interested in the development of Iowa commercial laws and later successfully operated in Colorado Springs and Cripple Creek mining properties.

George H. Tong, one of the best known early pioneers of Montana, died at Butte, last week, after a lingering illness. He was born at Toledo, O., on June 14, 1844. At a very early age he removed to Iowa with his parents, where he acquired his early education. In 1864, at the age of 20 years, he went west, and for several years devoted his attention to placer mining near Helena and Blackfoot, Mont. He acquired wealth rapidly and was at one time during his early career the owner of the Vulcan Mine. Later he came into possession of the Goldsmith Mine and other properties, and for a long time was associated with Patrick Largey in numerous mining ventures. In 1885 he realized a fortune from the Goldsmith property, and retained an interest in it at the time of his death. For the last 5 years Mr. Tong paid but little attention to practical mining. He leaves a widow and 4 children.

Archibald Angus McLeod, who 10 years ago was one of the most conspicuous figures in railroad and financial circles in this country, died of heart failure in New York City on April 19. He had a remarkable career. He was born of poor parents on a farm in Compton County, Quebec, in 1848, came to this country when a boy, and at one time was clerk in a store in Marquette, Mich. In 1869 he was clerk in a bank in Duluth, Minn.

While a young man, as a rodman on the Northern Pacific Railroad, he attracted the attention of Austin Corbin, then connected with the affairs of Jay Cooke, and through Mr. Corbin's influence his subsequent career was possible. Mr. Corbin later made Mr. McLeod general manager of the Elmira, Cortland & Northern, a small railroad in New York State. He managed that property well. When Austin Corbin became president of the Reading in 1886, Mr. McLeod became general manager, and, later, its vice-president, and made an excellent record as an operating manager. He had been elected a director of the Reading, and when Mr. Corbin retired as president, in 1890, was made his successor. Almost immediately he developed the great schemes by which he hoped the Reading would obtain the mastery of the anthracite coal trade.

On February 11, 1892, announcement was made that the Reading had obtained control of the Lehigh Valley and Jersey Central for a term of 999 years. The plan embraced the consolidation of the officers engaged in the anthracite coal trade under one general management, and the executive head of that management was to be President McLeod. It was his expectation to save $11,000,000 annually in economy of traffic, and this was to be divided among the railroads interested. Details of the manner in which the plan was to be carried through and the reasons for its sudden failure are given elsewhere. When the Reading went into bankruptcy in 1893 Mr. McLeod was president of the Boston & Maine Railroad and of the New York & New England. He became one of the 3 receivers of the Philadelphia & Reading Railway Company and of the Philadelphia & Reading Coal and Iron Company. Of late years Mr. McLeod had passed out of the public eye. At his death he was connected with the American Air Power Company and was a director of the American Railway Company and of the Hartford & Connecticut Western Railway Company. He left a widow and a son.

SOCIETIES AND TECHNICAL SCHOOLS.

American Chemical Society—New York Section.—At the regular meeting on April 7, the following papers were read:—

E. B. Voorhees: "A Study of Denitrification by Means of Cylinder Experiments." John A. Mathews: "Upon the Electrical Conductivity of Alloys." M. T. Bogert and W. F. Hand: "The Synthesis of Ketodihydroquinazolines from the Nitriles of O-Amino Acids." W. O. Atwater: "Metabolism of Matter and Energy in the Living Organism."

The "Electrical Conductivity of Alloys" and the "Metabolism of Matter and Energy in the Living Organism" were received with much interest and were freely discussed. Attention was called to the fact that only two more meetings remain for the present season and the number of papers to be disposed of is unusually great. Authors desiring to have their papers included for these meetings should communicate with the chairman or secretary at once.

Engineers' Club of St. Louis.—At the meeting on April 16 there were present 33 members and 6 visitors. Mr. J. J. Kessler, Jr., was elected to membership.

The president introduced Mr. R. H. Klauder, who presented a paper entitled: "Present American Storage Battery Practice." While America was not first in the adoption of the electrical accumulator it has surpassed European countries in successful methods of its application. Fundamentally the necessity for the use of a storage battery depends on the fact that the loads on generating stations vary, resulting in requiring investment in machinery which may have the opportunity, during only a short por-

tion of its life, of earning a return. The variation in the load also results in low economy. The ideal condition for a station would be to have generating machinery run through the entire 24 hours at a uniform load. This is not possible as a battery large enough for this costs more than the saving to be obtained from it. All that it is practicable to do, therefore, is to install a battery large enough to take care of the sharpest part of the peak and to carry the entire load during minimum hours. In railway work a storage battery may be applied either as an auxiliary to the generating machinery or the distributing system. In the generating stations it increases the economy of the engines, reduces the depreciation and repairs on the machinery and increases the capacity of the station. When applied to a direct current feeder it increases its capacity, reduces the loss in the copper, reduces the fixed charges per kilowatt hour delivered and maintains the pressure. In rotary sub-stations the equipment, including batteries, costs no more than that without them and is much more economical. In isolated plants a battery permits electric elevators to be supplied from the same generators as furnish light besides giving current at all hours of the 24 without the necessity of running the machinery.

The paper was discussed by Messrs. Reber, Zeller, Langsdorf, Roper and others.

INDUSTRIAL NOTES.

The Clot Company, Pacific Coast agents of the Mietz & Weis kerosene engines, recently shipped a 20-h.p. engine from San Francisco to Honolulu, H. I.

The Globe Iron Works, of Stockton, Cal., reports good sales of Truax automatic ore cars, and last week made one shipment of 51 cars to Spokane, Wash.

The Universal Automobile Company, of 137 First street, San Francisco, Cal., has purchased the patents and will begin the manufacture of the Lightner mill.

The American Diamond Rock Drill Company has moved into larger and more commodious offices, and its address will be hereafter 95-97 Liberty street, New York City.

The New Jersey Zinc and Iron Company, of Palmerton, Pa., is to build additions to its plant. Two 70-ft. furnaces to operate on spiegeleisen are to be built and 96 oxide furnaces.

The Harrisburg Foundry and Machine Company has obtained the order for the 225-h.p. engine to be installed in the new plant of the Chrome Steel Works, at Carteret, N. J.

The Ashton Fire Brick and Tile Company, of Salt Lake, Utah, has received 2 car-loads of machinery for its new plant and is putting it in place. The works will be running in about 2 weeks.

The new rock drill invented by A. C. Bates, of San Francisco, Cal., is now placed on the market by Griffitts & Howlett, manufacturers of mining machinery, 85 Fremont street, San Francisco.

The Kent Mill Company, of New York City, is to remove its offices on May 1 to 170 Broadway, opposite Liberty street. The growth of its business made necessary the removal to secure more commodious quarters.

The Vulcan Crucible Steel Company, of Pittsburg, Pa., that recently built a crucible steel plant at Aliquippa, Pa., is drawing plans for a rolling mill and open-hearth furnace to be added to the works. The concern now manufactures crucible tool steel.

The Carborundum Company, of Niagara Falls, N. Y., reports that while the increase in sales for the first quarter of 1901 was 35 per cent greater than that of 1900, the increase during the first quarter of this year was 41 per cent over that of the corresponding quarter of 1901.

The Bullock Electric Manufacturing Company, of Cincinnati, O., has decided to erect another building to its big plant at Norwood to be called a service building. This is to accommodate the pattern shop, general store room, and large dining room for the employes of the works.

The H. W. Johns-Manville Company, of New York and Milwaukee, has received an order from the Pacific Coast Oil Company, to cover about 250 miles of 8-in. pipe, which is to be laid from Bakersfield to Port Richmond, Cal. This is reported to be the largest order for pipe covering ever placed.

Jones & Laughlins, Limited, of Pittsburg, Pa., will soon have the Talbot open-hearth furnace at the South Side mills ready. It is expected that this furnace will start early in May and will turn out about 300 tons of steel per day. Should the steel prove satisfactory Jones & Laughlins will probably install a second Talbot furnace.

The S. Obermayer Company, of Cincinnati, O., recently made a shipment of foundry supplies and foundry facings to be used in the new plant of the British Westinghouse Electric and Manufacturing Company at Manchester, England. The S. Obermayer Company reports a good business and a large demand for all kinds of foundry supplies.

The Denver Engineering Works Company, of Denver, Colo., has secured a contract for a large plant to be installed at the Candelaria Mine, State of Zacetacas, Mex. The plant will consist of two 125-h.p. engines to be direct-connected to 75-k.w. generators of the Crocker-Wheeler Company's manufacture, together with switchboards, regulating apparatus, etc.

The Acme Mining Machinery Company, of Salt Lake, Utah, has booked an order from Charles Balbock for boilers, rolls and feeders for the Washington Mine, in Boise Basin, Idaho. The Acme Company is putting up a 25-ton jigging plant for the Chicago Lode Mine, at Bingham, Utah, the plant to be a duplicate of the plant being built by the company for the Mono Mine, near Ophir.

Randolph Brandt, of New York City, manufacturer of the "Selden" packing has just returned from a Western trip. He reports the number and size of the orders for the "Selden" were the largest in his experience. The battleship *Illinois* uses as large a size as 1⅜ "Selden" packing and has recently had some delivered by the manufacturer. The fastest torpedo boats use this packing on their engine rods.

The plants of the Savage Fire Brick Company, at Hyndman, Keystone Junction and Williams, Pa., having a combined capacity of 15,000,000 brick daily, and the company's coal and fire clay lands, have been purchased by Scott Dibert and John H. Waters, of Johnstown, Pa.; W. S. Ravenscroft, of Ridgway, Pa.; Francis J. Torrance, of Pittsburg, and others. Mr. Dibert is president, and Mr. Waters vice-president and treasurer.

The entire plant of the Mexican National Iron and Steel Company, near the famous "Iron Mountain," at Durango, Mex., except the rolling mill and blast furnace, was destroyed by fire recently. The loss is placed at $300,000, with no insurance. There was a lack of water and adequate facilities for fighting the fire. The works had been idle for 2 or 3 weeks on account of a shortage of pig iron. It is feared the plant will not be rebuilt.

The Denver Engineering Works Company, of Denver, Colo., recently shipped a car-load of sheet steel jackets for the copper matte furnaces at the Bingham Copper and Gold Mining Company's plant in Utah. This shipment will be followed by several car-loads of similar jackets. The large number of sheet steel jackets manufactured by this company has warranted the purchase of special machinery for this class of work.

The Scott-Strevell Hardware Company of Salt Lake, has sold 2 car-loads of the Western Wheel Scraper Company's scrapers to a prominent railroad contractor. The firm reports an unusual heavy demand for powder and fuse, and has booked contracts for heavy sheet iron work for the United States Mining Company, for the Murray plant of the American Smelting and Refining Company, and for the Portland Cement Company of Utah.

The amalgamation has been announced of 10 iron manufacturing firms in British Columbia. The concerns are in Victoria, Vancouver, Ladysmith, Nanaimo and Westminster. The firms are the Vancouver Engineering Company and the Albion Iron Works, Victoria: Albion Iron Works, Vancouver; the Victoria Machinery and Depot Company; the Andrew Gray Iron Works, the Schaake Iron Works, the Dobson Iron Works, Nanaimo, and the Wilson Iron Works.

The compressor for the United States Mining Company, at Bingham, Utah, is from the works of the Allis-Chalmers Company. The size of the machine is as follows: Steam cylinders, 22 and 40 ins. in diameter; air cylinders, 36 and 22 in. in diameter, all 40-in. stroke. The compressor runs condensing and compounds the steam used and air delivered, delivering about 3,400 cu. ft. of free air per minute. The engines for the smelter at Bingham Junction are beginning to arrive from the Allis-Chalmers shops.

The Ames Iron Works, of Oswego, N. Y., recently secured contracts through the American electric engineering and contracting firm of Bagnall & Hilles, Singapore offices, for a 100-h.p. high-speed engine to be direct connected to a 50-k.w. generator built by the Sprague Electric Company, to be installed in an electric lighting plant at Singapore. An American electric light plant has been ordered for installation in the palace of the Sultan of Linga, Malay Archipelago.

E. E. Erikson, of Pittsburg, Pa., has closed contracts to erect 2 acid open-hearth furnaces of 15 tons capacity for the Chrome Steel Company, of New York City, which will locate at Carteret, N. J. The contracts also call for 3 plate heating regenerative furnaces, with gas producers. Mr. Erikson has also closed contracts to build 2 regenerative heating furnaces for the Burden Iron Company, Troy, N. Y., and 2 continuous billet heating furnaces for Henry Disston & Sons, New York City.

Charles H. Besley & Company, of Chicago, Ill., have recently made shipments of the Gardner grinders to Oregon, Wisconsin, Connecticut, New York and Massachusetts. They are further receiving numerous orders from agricultural implement manufacturers for their "Badger" and "Bonanza" oil cups, and are making liberal shipments of "Helmet" oil to all parts of the country. The company reports its small tool business very good, the trade in tools and supplies coming from every section of the Union.

The Salt Lake, Utah, branch of the General Electric Company, S. A. Benson, manager, has been awarded the contract for 2 electric locomotives for the United States Mining Company, of Bingham. In addition, it has been awarded the contract for a 400-h.p. electrical plant for the Clark Electric Power Company, of Tooele, which will furnish light and power for Senator W. A. Clark's Ophir Hill mine and mill, and also light and power for Stockton and Tooele City. The plant will be supplied with 2 pipe lines, the motive power to be impulse wheels.

The Foster Engineering Company, of Newark, N. J., has received orders from the Republic Iron and Steel Company, of Youngstown, O., for 1 12-in. Class W. pressure regulator, and from the Pennsylvania Iron Works Company an order for 2 5-in. Class W. pressure regulators. Among other important orders received recently were one for an 8-in. Class W. pressure regulator, from Armour & Company; 4 2-in., 2 3-in., 2 3½-in. and 5 2-in. Class W. pressure regulators for the Burlee Dry Dock Company; 8 7-in. Class W. pressure regulators for the Westinghouse Machine Company, and 6 large valves to be installed in the various mills of the American Thread Company.

The Vulcan Metal Refining Company, of Sewaren, N. J., and the Vulcan Western Company, of Streator, Ill., have been acquired by a syndicate formed by Messrs. G. Sidenberg & Kraus, bankers, of New York City. The 2 companies acquired convert tin plate scrap into steel and pig tin. The syndicate will form a new corporation, the Vulcan Detinning Company, under the laws of New Jersey, with a paid-up capital of $3,500,000, to operate these plants. The board of directors of the new company will be: Samuel R. Beardsley, Joseph B. Bloomingdale, Lyman G. Bloomingdale, Stephen A. Ginna, Meyer Hecht, Adolph Kern and Harry Kraus.

The Reeves Engine Company, of Trenton, N. J., recently elected these officers: Clifton Reeves, inventor of the Reeves compound engine, president; William M. Muschert, vice president; A. C. Reeves, treasurer; William A. Buckman, secretary. The Board of Directors comprises: Wallace Buckman and Owen Moon, Jr., of Trenton, and Richard H. Reed, of New York City, besides the officers named. The executive committee is made up of A. C. Reeves, Owen Moon, Jr., and R. H. Reed. Among the principal stockholders are E. H. Buckman, of Chester, Pa.; Charles A. Parsons, Penn Valley, Pa., and I. V. W. Buckman, of Trenton, N. J. An office and sales department will be established in New York City. The company was recently incorporated with a capital stock of $400,000.

A large blast furnace is to be built at Cleveland, O. One million dollars of capital has been subscribed; the engineering work is to be in charge of Julian Kennedy, of Pittsburg. Rogers, Brown & Company will manage the enterprise. They already control the Tonawanda Iron & Steel Company, Buffalo; Punxsutawney Iron Company, Western Pennsylvania; Hanging Rock Iron Company, Southern Ohio, and Iroquois Iron Company, South Chicago. D. B. Meacham, of Rogers, Brown & Company, is president, and David T. Croxton, manager of the Pennsylvania Iron and Coal Company, of Canal Dover, O., general manager. S. W. Croxton, of Cleveland, is also interested, as are William G. Park, of New York City; J. G. Battelle, of New York City, and Cleveland parties. Contracts are being let for the first of the 2 furnaces, each to be of 400 tons daily capacity. Bessemer, basic and foundry pig will be made. The office will be in the Perry-Payne Building, Cleveland.

Among the orders received within the past few days by the Colorado Iron Works Company, of Denver, Colo., are: A rubber top Bartlett table for the Helena & Livingston Smelting and Refining Company, of Helena, Mont.; a 10-in. by 20-in. Blake crusher for the United States Mining Company, of Salt Lake City; a Bartlett automatic slimer for the Bunker Hill & Sullivan Mining and Concentrating Company, of Kellogg, Idaho; a 36-in. by 20-in. lead matte blast furnace for the Ohio & Colorado Smelting and Refining Company, of Salida, Colo.; a 38-in. by 120-in. copper matting furnace with accessories for the Coahuila Mining and Smelting Company of Monterey, Mex.; a 100-ton pneumatic cyanide plant complete, to be erected ready for operation, for the Tobasco Gold Mining and Milling Company, of Lake City, Colo.; 2 Bartlett automatic slimers for the Batopilas Mining Company, of Batopilas, Mex.; 2 iron top Bartlett tables for the Stearns-Roger Manufacturing Company, of Denver.

The charcoal blast furnace of the Pioneer Iron Company, at Presque Isle, near Marquette, Mich., which will cost about $1,000,000, is now half done. The plant, which is to be one of the largest and best equipped in the world, is expected to be in operation by January 1, 1903. It will occupy 15 acres of ground. Among the buildings to be constructed are the furnace building proper, a chemical building, a boiler house, a pumping station, a cast house and a stock house, besides 50 charcoal burners and 3 hot blast stoves. The furnace and the stoves are about completed. Work on the stand pipe is nearly done. Construction on the other buildings will begin almost immediately. The charcoal burners are expected to be finished by the last of July. The boiler house will be 60 by 175 ft., and will contain 20 boilers, 8 of which are already installed. The building for the chemical works will be 90 by 150 ft., and the pumping station will be in a building 50 by 125 ft. The iron work for the different buildings is furnished by the W. B. Pollock Company, of Youngstown, O. It was started last October and is about half completed. A force of 35 men is employed, which will soon be increased to 200. The Robert Engineering Company, of Philadelphia, has the contract for installing the furnace and machinery. The Pioneer Company will employ 200 men around the furnace and 500 more will be engaged in the woods near Marquette in getting out the hardwood for charcoal. The company also expects to manufacture wood alcohol. The capacity of the furnace plant will be 200 tons of charcoal iron a day. The ore will come from the mines of the Cleveland Cliffs Company, at Ishpeming and Negaunee.

TRADE CATALOGUES.

The Harrington & Richards Arms Company, of Worcester, Mass., issues a 28-page illustrated pamphlet describing its revolvers and single-barreled shot guns.

Golding & Company, of Boston, New York, Philadelphia and Chicago issue a little 8-page pamphlet of hand printing presses designed for printing titles on the tracing cloth of maps, drawings, etc., doing quickly what would require some labor by an expert draughtsman. For use with these presses the company recommends a particular ink.

The Buffalo Forge Company, of Buffalo, N. Y., manufacturer of Buffalo forges, has just issued its new catalogue for distribution. This is a handy little book, envelope size, illustrated with half-tone engravings, describing in detail the many different types and sizes of portable blacksmiths,' machinists', boilermakers', toolmakers', riveting and jewelers' forges; bench forges for light work; railroaders' and prospectors' forges, bellows forges, foot power, brazing and melting forges and folding forges for marine service, and includes descriptions of Buffalo hand blowers, power and hand drills, punches, shears, bar cutters, tire benders and tire upsetters.

The Thew Automatic Shovel Company, of Lorain, O., issues circulars No. 1 and No. 2, 12-page pamphlets describing the company's steam shovels. Circular 1 tells about single truck steam shovels for ore and fuel docks, blast furnaces and steel works, brick yards and clay working plants, placer mines and for general contracting work. These shovels are made in 2 sizes, with a capacity for handling from 50 to 150 tons of material per hour. Circular No. 2 tells of heavier shovels for railroad and mining purposes. These are made in 4 sizes, weighing from 38 to 70 tons and having a dipper capacity of 1½ to 3 cu. yd. The company sends copies of these circulars to any one interested upon application.

Modern methods of handling raw and manufactured products and transmitting power are described in a 240-page booklet published by the Link-Belt Machinery Company, of Chicago, Ill. This is No. 28 of the company's price lists and maintains in its illustrations and descriptive matter the high standard of its predecessors. The Link Belt Company manufactures for coal and metal mines elevators, conveyors and carriers, breakers and disintegrators, shaking and revolving screens, steam and gravity operated weigh boxes, picking-tables, etc., the Luhrig coal washer and also machinery for cement mills and gold dredgers. The pamphlet gives specifications and prices of various types conveyors with their attachments. Of power transmitting machinery the company manufactures pulleys, belting, sheaves for manilla rope transmissions, also spur, bevel, mitre, core and friction gearing, friction clutches, shafting, bearings, hangers, etc.

Pawling & Harnischfeger, of Milwaukee, Wis., have issued Bulletin No. 7 of their series of illustrated pamphlets describing their products. This pamphlet tells about traveling electric hoists having a capacity of from 1½ to 5 tons. These hoists are furnished with 1 or 2 motors as desired. The motors used are built by the company and are said to be especially designed for traveling electric hoist service combining large starting power with low speeds. Voltages of 110, 220 or 500 volts, it is stated, can be arranged for. The hoisting motor brake is described as simple, powerful and automatic and capable of sustaining the full load on the drum independently of the load brake if necessary. The load brake is said to be located so that the fewest number of parts come between it and the hoisting drum, while the load is automatically sustained and cannot run down through interruptions of current or the operator's carelessness, but must be pushed down by reversing the hoist-motor. The company's cranes are installed in some of the largest industrial plants in this country.

A cloth-bound book of 175 pages that contains much information not found in the ordinary run of trade catalogues, is published by R. D. Wood & Company, of Philadelphia, Pa. The book describes the water and gas works appliances and pumping machinery that the company makes. It is not a treatise, but is intended to answer some of the questions often asked by persons contemplating the building of new water and gas works and will not only be interesting to such but also of assistance to those in charge of established plants. A valuable feature of the book are the numerous tables and formulae given. Under the head of gas works are discussed gas works appliances, distillation, water gas retorts, coke oven gas, gas purification, meters, gas holders, iron pipe, etc., while that part of the book devoted to water takes up water supply, cast iron pipe, culvert pipe, flexible joint pipe, castings of various designs, hydraulic valves, Eddy valves, check and foot valves, relief and air valves, tanks, steam pumping engines, centrifugal pumps and the Geyelin-Jonval turbine for driving water power pumps, electrical generators and mill machinery.

GENERAL MINING NEWS.

ALABAMA.

BIBB COUNTY.

(From Our Special Correspondent.)

Galloway Coal and Coke Company.—This company is preparing to ship coal from its new mines at Garnsey.

BLOUNT COUNTY.

(From Our Special Correspondent.)

Lehigh Coal Company.—Mines are being opened on properties of this company and others. Indications point to the development of much coal land in this county as soon as the Louisville & Nashville Railroad constructs its new branch, a distance of 7 miles.

WALKER COUNTY.

(From Our Special Correspondent.)

Globe Coal Company.—The new mines along the Flat Top Mountain branch of the Southern Railway, have started work and by the time the railroad is finished it is believed that regular shipments of coal will be made. Employment will be given to about 200 miners.

Sloss-Sheffield Steel and Iron Company.—This company is rushing work on its Flat Top Mountain mines.

ARIZONA.

COCHISE COUNTY.

Copper Queen.—Work is proceeding actively in preparation for the new smelter at Douglas. The smelter is to be controlled by a separate corporation to be known as the Douglas Reduction Works. The company has acquired title to 650 acres of land, extending up to the western boundary of the Douglas townsite. The smelter is to be 235 by 150 ft., the power house 270 by 100 ft. and the boiler house 200 by 40 ft.

The ores received by rail will be put in 3 pits, instead of ore bins. The pits will be 38 by 100 ft. in size, excavated 12 ft. deep. The 3 pits will be parallel to one another, and lined with concrete. In each pit will be a traveling steam shovel that will hoist the mixed ore into cars on trestles 18 ft. above. At the smelter the ore supply tracks will be 50 ft. high.

CALIFORNIA.

AMADOR COUNTY.

(From Our Special Correspondent.)

Amador & Calaveras Reduction Company.—T. A. Nelson, E. H. Clary, N. W. Mahaffey and John Marshall, of Jackson, and F. H. Cordway, of Lodi, have incorporated this company to exploit the Wiest process. Some experiments have been made with the process at Jackson, but they were too crude to be conclusive.

Bay State Mining Company.—The creditors of this company, at Plymouth, Martin Jones, superintendent, have given an extension of time for the Rhetta Mining Company to purchase the property.

Keystone Consolidated Gold Mining Company.—At the mine, at Amador City, Chas. E. Bunker superintendent, and M. J. McDonald, Mills Building, San Francisco, president, the old 40-stamp mill has been remodeled and 20 stamps added. An electric motor runs the mill and the hoist will shortly be operated by compressed air. The present lowest working level is 900 ft, the 1,000-ft. level being filled with water. The ore, while low grade, is profitable.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Angels.—This mine, at Angels, Thos. H. Fullen superintendent, James V. Coleman, of San Francisco, owner, will soon have the 20 stamps of the California-Ophir Mine removed to its property and 40 more stamps are to be erected.

Bernasconi Ranch.—Frank Bernasconi, of Fourth Crossing, is prospecting a large ledge on his home ranch by a shaft. The gulches in the vicinity were rich in the early days of mining.

Guiffra.—This mine, near Mokelumne Hill, which has been bonded to Col. Robinson, of Los Angeles, has started up again.

Fanny Marie.—This company, at Glencoe, Chas. H. Blake, superintendent, is about to erect a 20-stamp mill and other machinery. The recently struck shoot on the 300-ft. level holds out well.

Lightner.—This company, at Angels, Alex. Chalmers superintendent, has made a rich strike recently. The mine has been paying well for some time.

Sugar Pine.—At this mine, near Angels, owned by the San Joaquin Mining Company, H. F. Stewart superintendent, the 5-stamp mill has been running on good ore for the past 4 weeks.

Utica.—This company, at Angels, is about to enlarge its electric plant just east of Murphys. A new ditch will be dug. An increased demand for power for mining all along the line has prompted the improvements.

MADERA COUNTY.

(From Our Special Correspondent.)

Daulton.—C. Van Timmons and Jackson Orr, of Denver, Colo., have bonded some mining ground on the Daulton Estate, at Daulton, and are sinking shafts to develop copper deposits.

MARIPOSA COUNTY.

(From Our Special Correspondent.)

Jones.—Ed. Jones, of Whitlock, has taken a number of nuggets from his pocket quartz mine. The vein averages 2 ft., and some nuggets worth $43 and $85 have been found.

Mariposa Commercial and Mining Company.—This company, at Mount Bullion, C. C. Derby manager, has almost completed its new electric power line from the river to Mariposa, a distance of 16 miles.

MONO COUNTY.

(From Our Special Correspondent.)

Blue Vein.—This mine, formerly the Boston Consolidated, at Bodie, owned by D. McDonald, A. P. Cameron, R. McInnis, S. Tokio and O. Gallagher, has been bonded to A. Volkman and others, of San Francisco. The first payment of $20,000 is to be made on June 1, when 20 men will be set at work and hoisting works, etc., put up. There are 9 claims in all, and on the Blue Vein proper there is a 520-ft. shaft with drifts.

White Mountain Mining Company.—Fifty mining claims near Benton have been deeded by S. P. Lines and J. B. Cowan to this company, of Delaware, together with water rights and mill sites. Preliminary work is being done. The values are in copper and silver. Reduction works will be put up as soon as developments warrant.

NEVADA COUNTY.

(From Our Special Correspondent.)

Blue Tent Mining Company.—This property, at Nevada City, is shipping in machinery, including a 3-stamp mill for crushing gravel. Twenty men are at work, and the tunnel is in about 500 ft. The superintendent is Clifford Graham.

Champion.—This company has elected the following directors for the year: H. Mohr, C. J. Schuster, Jos. Fetz, M. Nonnerman, F. Zeitler, I. Rosenthal and J. Ott. The offices are in the Crocker Building, San Francisco; E. R. Abadie is superintendent at Nevada City.

RIVERSIDE COUNTY.

(From Our Special Correspondent.)

Red Cloud Mining Company.—The mines are near Salton. S. P. Creasinger, of Los Angeles, is president and E. N. Gould, of Salton, is superintendent. C. W. Bennett is at present acting superintendent. Work is starting, the machinery not being all up yet. Some experimental runs have been made on ore to find the best way to work it. Twenty-five men are employed in development.

SACRAMENTO COUNTY.

(From Our Special Correspondent.)

Fassler Ranch.—For this ranch, under bond to Preston Woods and L. McDonald, machinery for gravel mining has been ordered.

Gold Dredgers.—Work on the two dredgers at Teats Flat and Mississippi Bar progresses rapidly.

Natoma Grant.—On this grant the Natoma Mining Company at Natoma continues prospecting. At the bottom of the shaft coarse gold is found and the gravel prospects 25c. per pan.

White Wings.—This new company is operating near Folsom on the Perrazo ranch. Engines and boilers are being put up and active mining will shortly start.

SAN BENITO COUNTY.

(From Our Special Correspondent.)

Aurora.—On this mine, near San Benito, H. B. Hunsacker and B. I. Potter, managers, 17 men are developing a body of cinnabar ore.

Cerro Benito.—Kennedy Brothers are working this quicksilver mine near Panoche with good indications. The mine has been idle for some years.

Monterey Quicksilver Mining Company.—The mines of this company near New Idria are being developed. Ore is being taken from the short tunnel.

Stayton.—This quicksilver mine, after a shut down of many years, has resumed operations. Extensive prospecting is under way.

SAN BERNARDINO COUNTY.

(From Our Special Correspondent.)

Antimony Discovery.—John T. Reed, S. S. Thomas, and E. Swarthout have struck a 12-ft. ledge of antimony ore 12 miles north of Randsburg.

SAN DIEGO COUNTY.

(From Our Special Correspondent.)

Stonewall.—This old mine at Cuyamaca is to be reopened, after some years idleness, by Col. S. H. Lucas, representing Eastern purchasers. The property is equipped with a fine mill and other machinery and once was a large producer.

SHASTA COUNTY.

(From Our Special Correspondent.)

Minnesota.—The 10-stamp mill at this mine, near Fielding, has been sold to be removed to a mine near Hornbrook. The Mountain Copper Company's railroad runs past the Minnesota and the ore is shipped to the smelters at Keswick.

Mount Shasta Gold Mines Corporation.—The new mill and concentrating plant at Shasta, F. E. Ware, manager, have started. A large hoist has been installed, also an air compressor for drills.

Oro Fino.—This group of 3 claims, near Shasta, has been bonded by Wm. Moran, who is organizing a company to operate it. The claims are near the Mount Shasta group.

TRINITY COUNTY.

(From Our Special Correspondent.)

Dorleska.—Notwithstanding the heavy fall of snow since February 1 at this mine, near Abrams, work underground has gone on steadily. The vertical shaft has been sunk to 200 ft., and a third level started. Tunnel No. 2 was started in September to connect the shaft with this third level. It will be 1,300 ft. long, of which about 400 ft. is cross-cut, and the remainder a drift on the vein. The first contract for 500 ft. has been completed, and a second contract for 500 ft. closed and the tunnel is now in about 600 ft. A 3 1-2-ft. Huntington mill was run until the heavy snows compelled it to close. It will start up as soon as teams can haul ore and fuel. Last season, with a small prospecting mill, over $35,000 it is said, were extracted from ore. Sufficient ore is now blocked out to supply the mill during the coming season. Twenty men are employed, under Superintendent M. H. MacIlwaine, of Abrams. The Union Consolidated Gold Mines Company, of Los Angeles, is owner, and H. Z. Osborne, general manager.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

Black Oak.—On this property, at Soulsbyville, W. P. Scott, superintendent, a new hoist has been installed.

Dead Horse.—The mill at this mine, owned by the Consolidated Eureka Mining Company, has started again. The property is owned by the Hayward, Lane and Hobart estates, San Francisco.

Draper.—This mine, at Soulsbyville, is supplying the mill with good ore. The shaft is to be sunk another 100 ft. Oil is to be used as fuel.

Galway.—John Daly has sold to J. F. and F. H. Baker, of Carters, his half interest in the Galway, Old Glory, Little Johnnie, Never Sweat and River View claims, south of Carters.

Jumper Gold Syndicate of California, Limited.—This property at Stent, P. Geo. Gow, general manager, yielded last year $417,300, according to the report of the manager at the annual meeting in London. The 60-stamp mill ran 11 months, crushing 54,344 tons of ore at a cost of $10,427. The ore reserves in sight are estimated at 155,575 tons, an increase of 51,575 tons for the year.

Prudhomme.—On this mine, near Carters, J. Prudhomme superintendent, a lot of new machinery is being put in.

Republican.—This mine, at Chinese Camp, B. F. Deleray superintendent, is to have 10 stamps added to its mill and a chlorination plant is projected.

Santa Ysabel.—This Boston, Mass., company, at Stent, has a small crew at work on its mine adjoining the Golden Rule.

Sunnyside.—On this group of claims, near Carters, a 10-stamp mill is to be erected.

Sweeney.—This property, adjoining the Dutch Mine, at Quartz, has been sold by the Piedmont Gold Mining Company to Henry Brunner, of San Francisco.

Table Mountain.—The machinery for this claim, near Columbia, bonded to Stanford and Estee, has arrived and will be put in at once.

COLORADO.

BOULDER COUNTY.

Boulder Oil Wells.—Oil is reported struck in the Republic well. The Martin well is down about 2,730 ft. The Alamo is putting in a new steel cable. A new steel cable is to be put in also at the Boulder Basin, now down 2,325 ft. The Phenomenal is down 1,260 ft. The King has not recovered its bailer. The Me-Edma Oil Company has bought from Charles Page, Charles H. White and F. E. Brooks a tract of 20 acres in section 21 of the oil belt, paying for the land $4,000 cash.

(From Our Special Correspondent.)

Ward Rose.—This mine, near Wall Street, now in the hands of lessees, is reported producing ore of good grade.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

Kokomo-Pioneer Mining and Milling Company.—This property has closed, including the mill at Dumont, the Pioneer, Milton and Kokomo mines. A re-organization is said to be under way. The company has opened up considerable mineral but one man has been paying most of the expenses for the past year. There was dissatisfaction over the management as too many men were required. At the mill it was stated by the bookkeeper 14 men were employed treating only 50 tons of ore per day. Some of these were employed in overhauling the machinery. At the 3 mines the company was drilling by hand when it should have installed air compressors. The Kokomo has from 6 to 10 ft. of mill ore; the Milton from 2 to 3 ft. and the Pioneer 6 in. of smelting and 18 in. of mill ore.

Marshall-Russell Tunnel.—The new 12-drill compressor has started and the tunnel is being driven into Miller Mountain. A postoffice and telephone station are being established probably under the name of Marshall Park, and the railway station now known as Empire, will have the new name.

Newhouse Tunnel.—While cross-cutting has ceased, drifting is under way. The company is drifting near the heading on a gold vein it owns. The Sun & Moon Company is drifting east to reach a point where a raise will be made to the surface workings. The Bertha Company is also doing a lot of work in the tunnel and the Abbandwal Company which is consolidating with the Cleveland-Boston Company has started work at the surface and soon will be working drifts on its vein in the tunnel. Work on the Gem vein in the tunnel is slow, but it is stated that a consolidation of various interests is under way when a big force of drill men will be put at work in the drifts and the 200-ft. raise. The heading is in about 13,750 ft. and much nearer the Saratoga vein than is generally supposed. The Saratoga made a contract for working its vein but never signed it.

GILPIN COUNTY.

(From Our Special Correspondent.)

Mining Deeds and Transfers.—Etta M. Baldwin to the National Tunnel Mining and Milling Company, the Gold Trust group of 14 lodes, Lake and Gregory District; Fred E. Davies to G. B. Wilkinson, 1-2 interest Dolomite and Hepmatite lodes, Silver Lake District; J. H. LeMoyne et al to R. H. Hastie, Waltham lode, Russel District; S. C. Hayes to J. T. Clymo, the Big Lead lode, Mountain Home District; E. W. Clymo et al to Alton Hopkins, the Big Lead, Red Bug and Red Bug No. 2 lodes, Mountain House District; W. Smith to the Benzie Investment Company, the Elizabeth lode, Lake District.

Edinburgh Gold Mining and Milling Company.—This company, with head office in Denver, capital stock, $30,000, incorporators E. M. and V. Messiter and J. S. Ferguson, has been formed to operate the Centennial Mine in Russell District and will soon start work, with E. M. Messiter, Central City, as manager.

Egyptian.—C. P. Collins, of Bradford, Pa., who is working the Scandia Mine in Illinois-Central District, has secured a lease and bond on this adjoining property, and connections are to be made for increasing operations. M. Weisbeck, Bald Mountain, is in charge.

Elizabeth.—The Benzie Investment Company has purchased this claim in Lake District and will erect top buildings and install machinery. The main shaft is only down 90 ft. but the grade of the top ore has been good. Lon Drake, Central City, is to be in charge.

Justice Leasing Company.—Denver parties have formed a pool to operate the Justice Mine in Lower Lake District, and are preparing to sink the shaft 75 ft. T. Irvine, Central City, is in charge. The property has a good record.

Lombard.—The first cash payment on this group of claims in the Yankee District has been made, the total price being $60,000. The owner is Dr. Abe Ashbaugh, of Central City, while the purchasers are the Yankee Consolidated Mining, Milling and Tunnel Company, of which Capt. H. I. Seeman, Equitable Building, Denver, Colo., is head. The property consists of 5 lode claims and a mill site on which there is a 5-stamp mill. The average grade of the milling ores has been $13 per ton, while the smelting ores averaged $65, these ores carrying good lead values. The new owners intend to enlarge the stamp mill and make the property a steady shipper.

Oranoke Gold Mining and Milling Company.—A special meeting of this company will be held at its office, 628 Mining Exchange Building, Denver, on May 6, to consider selling the entire property to the Consolidated Nevada Gold Mining Company, organized under the laws of Wyoming. The company has secured under lease and bond for 3 years the King Mine, which has been idle for a number of years. G. Moore, Central City, is superintendent.

Russell Gulch Mining and Development Company.—Idaho Springs parties have taken a lease and bond on the Warfield group of 4 claims in Russell District and are erecting a shaft building 20 by 50 ft. and will put up a 25-h.p. plant. G. K. Kimball, Jr., Idaho Springs, is manager. The Robert Fulton, on which the main work will be done, is reported to be the extension of the well-known Old Town vein.

Waltham.—Idaho Springs parties have taken a lease and bond on this mine in Russell District, for 2 years, in the sum of $15,000. They are preparing to install a 40-h.p. gasoline hoist and will put up a new shaft-house. This lode is only a prospect, but all the top-dirt has given good values at the concentrators. R. H. Hastie, Bald Mountain, is manager.

GUNNISON COUNTY.

(From Our Special Correspondent.)

Mineral Point Mining Company.—This company is pushing work on the Laura Tunnel, in Marble District.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Leadville Ore Output.—The output averages 2,100 tons daily of all classes of ores. The increase is due principally to the 250 tons added by a resumption of the A. M. W. combination and a slight increase of the Home Company. Simon Guggenheim, of the American Smelting and Refining Company, says a very good market for all classes of ore is opening. He declares that the next few months will see improvements made by his company which will enable the handling of a much larger tonnage of low-grade ores, and he also states that plans are now being completed for largely increasing the capacity of the Arkansas Valley Smelter at Leadville.

Alicante.—Legal difficulties have been settled and the new lessees resume operations at once. Good ore has been opened up.

A. Y. & Minnie Leasing Company.—Arrangements are under way to develop the lower contacts. The company is tearing down the old mill and will put up its new mill at once at a cost of $25,000.

Caribou Mining Company.—Operations in virgin ground from the 570-ft. level have opened up a richer iron ore and shipments are to be increased 50 tons daily.

Cora Placer.—New lessees, headed by R. E. Cruzon, of Leadville, will operate this property, lying in a lake bed, at the head of the Arkansas River. Indications are reported good.

Evelyn Mining Company.—The new Evelyn shaft which encountered good sulphide bodies at 930 ft. is being sunk to 1,200 ft., where the diamond drill shows a strong sulphide ore shoot.

Gold Basin Mining Company.—This new shaft on the old Big Four property is searching for the main Big Four vein and a large amount of development work is being done. Smelter returns on recent shipments averaged over 7 oz. gold and 145 oz. silver. Sufficient ore is being mined to pay expenses. Drifts at 235 and 310 ft. are both in ore.

Home Extension Mining Company.—At the annual meeting, 300,000 shares were represented. Much of the stock is held in Boston, Mass., and these interests

were represented by E. K. Dunbar. Boston was given 3 and Leadville 2 directors. The new plan is to bond the property for $100,000 to the International Trust Company, and it was stated that $40,000 could be raised in Boston at once to push work. The Leadville committee secured $9,000 in subscriptions immediately after the meeting and an effort will be made to resume. The property lies in the Leadville Basin near the Home Company and closed down for lack of funds some months ago. A large body of manganiferous iron is exposed.

Homer Placer.—After prospecting with a diamond drill President Higgins of the Leadville Tunnel and Development Company is putting down a shaft on the Homer combination of 150 acres of virgin territory west of the city limits.

Keystone Mining Company.—This company has resumed operations on the Rex after getting its new machinery in. It is lowering the water rapidly.

Nayr Mining Company.—This company is operating the lower levels of the old White Cap shaft which is down to 800 ft. Several large bodies of low-grade sulphides have been cut. The main work is a new drift from the 800-ft. level to cut the old Imes gold ore shoot supposed to extend into the White Cap ground. The upper levels are to be operated under sub-lease.

Nevada.—The new strike in the new workings of the Nevada Tunnel has opened sufficiently to permit of shipments at once. The shoot is growing better as developed.

Ohio Mining and Leasing Company.—Work has been temporarily suspended owing to surface water. The main shaft is now 400 ft. deep. Ore has been followed on 2 levels, in one place widening to 18 in. of material averaging over 1-2 oz. gold.

Two-Bit Mining Company.—The new shaft is down 175 ft. It will go to 300 ft. Some very good ore is being taken out of the old workings.

United States Smelting Company.—This company, recently organized to take over the holdings of the American Zinc-Lead Company, has been formally incorporated, and the following officers elected: President, Charles L. Tutt; vice president and general manager, Charles M. MacNeill; secretary and treasurer, Spencer Penrose. D. C. Jackling is manager of the Canon City plant.

Valley Leasing Company.—The new shaft is down 100 ft. on the Valley and sinking has stopped to permit putting in new machinery. Meantime the working force is busy in the old shaft 300 ft. distant to run a drift to connect with the new shaft. Springfield, Mass., people head this company working under the direction of J. W. Deane.

Yak Mining, Milling and Tunnel Company.—The output is 3,500 tons a month from the various workings. The extension into Ibex ground of over 1,300 ft. has started.

PARK COUNTY.

(From Our Special Correspondent.)

Placer Mines.—Preparations are under way for placer working during the coming summer. Manager Rowe, of the Snowstorm, Hydraulic and Beaver Park, is reported as having abundant capital for immediate service. Manager John Fortune, of the Alma Placers, is also preparing for active work on these properties.

PITKIN COUNTY.

Argentum-Juniata Mining Company.—President J. A. Hayes, of this company, has issued to the stockholders a circular under date of April 11, calling for an assessment of 8c. per share.

A profit of $2,229 was realized in February and the property is producing a small profit over running expenses at present, but the reserves in the upper levels are rapidly approaching complete exhaustion, according to the circular, and it has become evident that unless the shareholders furnish immediate assistance, the mine at Aspen must be closed down soon. The money needed is for the exploitation of the 10th level south.

The plan proposed is to increase the capital stock of 1,300,000 shares to 1,600,000 shares and to borrow $100,000 from the stockholders, $50,000 for 1 year and $50,000 for 2 years, giving the company's notes at 8 per cent interest. For every dollar loaned, the company will give a stock bonus of 3 shares of the increased capitalization.

It is pointed out that several years ago the organization, with a capital stock of 1,000,000 shares, was in precisely the same dilemma, and that after an increase of 300,000 shares, and a loan from the stockholders, the amount was paid back with interest, and the company netted a neat sum from its exploitation.

The closing statement emphatically declares that in event of failure of stockholders to respond, the property must be closed down within a few weeks.

SAN MIGUEL COUNTY.

Nellie.—The North American Exploration Company has sold this mine at Telluride to the San Miguel Consolidated Mining and Milling Company, of which L. L. Nunn is general manager and Cooper Anderson resident manager. The consideration is not made public, and details as to the extent the property will be worked are not at present known. The Consolidated Company owns a fine concentrating mill of 125 stamps near the Nellie.

(From Our Special Correspondent.)

Japan Mining Company.—This company will, as soon as necessary arrangements can be made, start work on the lower tunnel. The buildings and compressor plant were blown up by a premature explosion of dynamite during February. Since then nothing has been done at the mine on account of inability to get lumber to the tunnel, and the impossibility of installing a new compressor.

TELLER COUNTY—CRIPPLE CREEK.

(From Our Special Correspondent.)

Mining Conditions.—On the whole, mining conditions in the Cripple Creek District appear to be improving. One or two of the large mines have laid off men and considerably more leases are now in operation. The Anaconda has closed all company work. The Portland has laid off some of its men temporarily, and the Elkton has also laid off some of its men, but probably as many men are at work in the district as 6 months ago.

Anaconda Gold Mining Company.—This company recently suspended operations on company account, but a large number of men are leasing and it is understood that a number more will soon start in. The company has a large amount of ground which has produced some very good ore mostly extracted by lessees, but the property has never paid on company account. F. J. Campbell, of Denver, is general manager and Milo Hoskins, of Anaconda, is superintendent.

Elkton Consolidated Gold Mining Company.—It is understood that a circular will be issued by the management saying that the next dividend will be passed. It is understood that the mine has been losing money for several months, but every effort is being made to return it to a paying basis. The main difficulty is the large amount of water that has to be handled, as the mine has to depend more and more on the lower levels.

Isabella Gold Mining Company.—The company's affairs are reported in better shape than for some time. A new ore shoot was recently opened on the 5th level, and a number of leasers are also taking out ore. Mr. Le Camp and associates recently started a shaft on the old Buena Vista claim and are down 18 ft. with some very fair ore in sight and have already shipped a carload. A number of leases have been granted since the new management took hold. E. M. De La Vergne, of Colorado Springs, is general manager and A. G. Campbell, of Cripple Creek, superintendent.

Laura Lee.—This property on Mineral Hill is again a scene of excitement. Some time ago a strike was made and a few pieces of very good ore were taken out. Lately but little has been heard of the find, and it was thought it was merely a rich pocket, with no lasting qualities. Development is watched with interest.

Pharmacist Gold Mining Company.—It is understood that McFarland & Ownbey will soon sink a large 2 compartment shaft to 800 ft. This leasing company has a lease on the north 400 ft. on the Burns claim of the Acacia Gold Mining Company and the north 650 ft. on the Pharmacist claim belonging to the Pharmacist Gold Mining Company. Some good ore is being taken out. The leasing company has applied for an extension of time and should this be granted work will start very shortly on the new shaft. The leasers have done a large amount of developing and prospecting, both on the Burns and Pharmacist claims. Some very good ore has been encountered in the winze on the 625-ft. level on the Pharmacist, and a shipment recently ran to $82 per ton.

IDAHO.

IDAHO COUNTY.

American Eagle.—At this property, on Siegel Creek, owned by R. A. Sherman, of Spokane, Wash., 2 tunnels, 200 and 300 ft. long, respectively, have been run. The ledge is said to be from 8 to 18 ft.

Buffalo Hump Syndicate.—It is reported that the mill at Buffalo is to be increased from 10 to 20 stamps.

Buffalo Queen.—At this property, on Crooked River, a 10-stamp mill is on the ground and a good force of men is at work.

Crackerjack.—The 10-stamp mill for this mine at Buffalo is being hauled in from Grangeville. A 35-h. p. boiler and engine with a saw mill form part of the machinery. The saw mill will be set up to get out lumber for the mill house.

Dewey Company.—It is stated that this company has ordered 100 stamps more and has located another mill site on Mounmental Creek, 3 miles from its mine in the Thunder Mountain District. The ore will be transported to the new mill by a wire tramway.

Gold Bug.—This property, in Big Creek District, near Dixie, is owned by John D. Glover and associates of St. Paul. During the past winter the shaft has been sunk 100 ft. and 200 ft. of drifting done. The ledge was cross-cut several times, showing ledge matter 25 to 30 ft. wide. The company has let a contract for sinking 100 ft. deeper, and is making arrangements to erect a large mill this summer.

Jumbo.—This 4-stamp mill at Buffalo has been running all winter. It is now connected with the mine by a wire tramway. The mill may be enlarged to 10 stamps this summer.

SHOSHONE COUNTY.

Alice.—Work is suspended on this group. The group is situated on Reddy Gulch midway between Wallace and Mullan, and a fine showing of carbonate ore was discovered on it 2 or 3 years ago. Col. W. H. Dewey last fall set a force of about 12 men at work under Martin Curran, of Boise, Ida. J. H. Foss and H. J. Rice of Mullan are the principal owners.

INDIANA.

CLAY COUNTY.

Coal Miners' Wages.—After holding a joint session for about 6 weeks, the block-coal miners on April 16 by a large majority vote accepted the operators' proposition, which is about the same as last year's, as the blacksmiths receive no advance.

The strike of the mine engineers has been settled by the operators granting a 9-hour day. The engineers had been working 12 hours and demanded an 8-hour day.

GREENE COUNTY.

Green Valley Coal Company.—This company is sinking three-quarters of a mile northwest of Jasonville, on a tract of 800 acres of leased land. Machines will be installed in the new mine, and when it is in full operation 200 men will be given employment. The officers and largest stockholders in the new company are David Engle, Oakland City, president; Joseph Martin, Rosedale, vice president, and Job Freeman, Linton, secretary, treasurer and general manager.

MARYLAND.

ALLEGANY COUNTY.

Niverton.—The fire in this mine of the W. K. Niver Coal Company, north of Frotsburg, is worse. This mine has a 4-ft. vein on top of the 9-ft. seam, and it is almost impossible to extinguish the fire. The fire has been burning 18 months.

MICHIGAN.

COPPER—HOUGHTON COUNTY.

(From Our Special Correspondent.)

Arcadian.—This company has granted the Copper Range Railroad a right-of-way through its property for the extension from Houghton to Calumet, via Lake Linden and Dollar Bay.

Atlantic.—The company has increased its capital stock from $1,000,000 to $2,500,000, divided into 100,000 shares of a par value of $25 each.

Baltic.—A 2,500-lb. mass of copper has been encountered in the 7th level of No. 3 shaft. Shaft No. 3 is down about 750 ft.; No. 4, 725 ft.; No. 5, 600 ft. Drifting at all three shafts is under way on the 6th level and the drifts will be holed through from one shaft to another within a few months. The mine is shipping 800 tons of rock to the mill daily.

Calumet & Hecla.—The Red Jacket shaft is shipping 600 tons of rock per day to the mills with only 2 compartments in commission. A Baldwin locomotive, with cylinders 18 by 24 in. and 8 drivers, has been received at the mine. Four car-loads of electrical machinery were recently received at Calumet from the General Electric Company, of Schenectady, N. Y., and shipped to Lake Linden for the addition to the Hecla Mill and the new power house. The foundations for the engines are completed and the work of installing the machinery will start at once.

Elm River.—There have been no important developments lately. Work in the cross-cut west from the bottom of the exploratory shaft continues.

Franklin.—A cross-cut east at the 10th level has encountered the Albany & Boston conglomerate lode at the old branch of the mine. The lode is wide and said to be well mineralized.

Isle Royale.—A mass of copper weighing 2 tons was hoisted from No. 2 shaft recently. The 3rd head at the mill is in commission.

Osceola.—Improvements at No. 1 shaft on the Kearsarge amygdaloid lode are about completed and the shaft will go into commission July 1. It is being cut down to 3-compartment size and retimbered. The South Kearsarge branch is shipping 575 tons of rock per day and the North Kearsarge branch 850 tons.

Tecumseh.—No. 1 shaft at this property is down about 1,850 ft. and sinking at the rate of 65 ft. per month. The lode carries some fine copper and it is expected that the rich copper shoots diping south from the Osceola No. 6 shaft will be penetrated.

Trimountain.—This company has purchased from

the Arcadian Copper Company the No. 4 rockhouse and equipment at the Arcadian Mine. The rockhouse is equipped with duplicate sets of jaw crushers, with 17 by 24-in. and 13 by 20-in. openings, also a steam hammer for handling masses and a 10 by 24-in. Corliss engine. The 70-drill compressor at No. 4 shaft, Arcadian, is being moved to the Trimountain.

Wolverine.—A spur track from No. 3 shaft to No. 4 shaft will be completed shortly. Work is under way on the foundations for a new compressor house at the south end of the mine. As soon as the building is completed a 25-drill Rand compressor will be installed.

Wyandot.—Diamond drill work continues. Operations are difficult owing to a 150-ft. overburden of sand. Two drills are in use.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Ahmeek.—Outside parties are negotiating for this property, just west of the Mohawk. It consists of 920 acres on the mineral belt. In the late 70's 2 shafts were sunk to 200 ft. each on the Kearsarge conglomerate. In the advent of a resumption of activity work will be confined to the Kearsarge amygdaloid, which outcrops on the southern portion of the property.

COPPER—ONTONAGON COUNTY.

(From Our Special Correspondent.)

Mass.—Thirty-five tons of mass and barrel copper have been shipped to the Quincy smelters this month and other shipments will follow. The yield of heavy copper this month has been large.

Victoria.—No. 2 shaft is sinking to the 16th level and hoisting from the 15th level is in progress. The lode in the lower workings carries considerable copper and numerous small masses are encountered. Work on a new shaft 2,000 ft. west of No. 2 will start as soon as the drift west of No. 2 shaft at the 13th level is in that distance.

MINNESOTA.

(From Our Special Correspondent.)

April will break all records in ore shipments for so early a month. The Duluth & Iron Range road alone will ship about 400,000 tons before May 1, and others are sending all possible. The Eastern Minnesota is shipping about 15,000 tons a day.

IRON—MESABI RANGE.

(From Our Special Correspondent.)

Ore has been found on the n. e. ¼ of section 17, R. 58, R. 19, northeast of the Sharon, on lands belonging to the State of Minnesota. Drills are working on the n. ½ of section 16, adjoining. Drills are also working on the north part of the s. ½ of 16, and on the northern part of section 15, adjoining to the east.

New exploring crews are starting in almost every day for the Itasca County lands on the western end of the Mesabi Range. Of the work so far done some has been satisfactory, and, as elsewhere, much has been fruitless.

Extensive drill exploration on section 8, T. 57, R. 21, close to the Stevenson Mine, has proven fruitless.

M. L. Fay, as an individual, and the Fay Exploration Company, have some 15 drills going, most of them on the Mesabi Range. They are working in T. 56, R. 24, and clear through to the eastern townships and are opening a mine near Hibbing. They are also drilling for gold-bearing rock in Carlton County, southwest of Duluth, and Mr. Fay is exploring some Idaho properties.

Biwabik Mining Company.—This company will do a large amount of stripping this year, and has started work. Its mining shovels start in a week.

Chicago Iron Company.—Fee-holders of the old Chicago property, near Biwabik, are exploring and have sunk several holes, most of them in rock. It is understood they will continue.

Columbia Mining Company.—This company, owning a property near Hibbing, has sunk a shaft about 100 ft. and is putting in machinery for extensive work. The mine will be a small shipper this year.

Day Lands.—Options are out on the North and South Day forties and on the Webb property, close to Hibbing, and the 3 may be sold soon. The 2 Day forties are already opened as mines, and the Webb is being explored. One hole there was sunk through 100 ft. of taconite and found a good deposit of ore under it—an unusual occurrence. These options run to the Eastern Minnesota, which has customers for the properties and is interested merely in the ore haul.

Kenney-Hawkins.—The deal for the purchase of this exploration in section 32, T. 57, R. 22, has been closed, the cash bonus for the lease amounting to $520,000, having been paid this week. The deal is through the Eastern Minnesota Railway, which puts up a part of the purchase price and gets the ore haul. There are about 30,000,000 tons of ore on the land, but most of it is low grade. It is claimed there are about 8,000,000 tons of good merchantable ore.

Minnewas.—The shaft house and head works of this mine, a State lease in the hands of the Minnesota Iron Company, are being shipped to the Clark Mine, another of the company's Mesabi properties.

Monroe.—A very large body of ore has been found in this property on the east part of section 28, T. 58, R. 20, and explorations are continuing steadily. Two hundred feet north of the north line of this land a hole has been put through 80 ft. of ore.

Niagara Iron Company.—This company has drilled the n. ½ of the n. e. ¼ of section 25, T. 58, R. 18, without results. The same company has drilled the south part of section 12, T. 57, R. 21, with the same result. It or allied interests are drilling lands north of and adjoining the Alpena, in T. 59, R. 17, but nothing has yet been found. These lands were explored 3 years ago and 8 ft. of clean ore cut.

Ranier Investment Company.—This company is exploring the lands of the Champion Mining Company in section 10 and 11, T. 58, R. 18.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—The top price of zinc ore was off $1 last week. The best price reported paid was $33 a ton, for ores from the Amsden lease at Carl Junction and from the Trouble, J. W. Ground and Glenwood leases on the Continental Company's tract near Joplin. Shipments generally were lighter than the preceding week, but there was much activity shown by the buyers and a pretty general clean-up of ores. Most of the ore was bought by the Lanyon Zinc Company, which purchased 1,300 tons of ore for delivery this week. The price paid was $30 a ton for 60 per cent. The pool formed by 3 of the largest producers several weeks ago to hold out for a horizontal price of $37.50 is still maintained. The members seem determined to hold out for their price and are confident that the smelters cannot do without the ore. Lead ore remained steady at $21.75 per 1,000 lbs. The following are the sales for the week ending April 19 by camps:

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	1,821,950	522,800	$40,522
Galena	1,289,060	144,670	20,149
Carterville	2,294,640	623,770	45,692
Cave Springs	329,710	18,100	5,340
Webb City	410,860	26,740	6,129
Spurgeon	444,810	73,740	6,646
Oronogo	662,930	25,090	11,009
Aurora	689,110	30,530	10,640
Zincite	258,450	25,500	4,560
Duenweg	.....	39,800	866
Central City	175,810	3,090	2,167
Granby	351,000	39,000	4,314
Stotts City	209,230	.....	3,138
Carl Junction	179,700	.....	2,747
Gilliam	61,000	.....	610
Total sales district	9,170,260	1,572,840	$164,539
Total 16 weeks	159,998,730	20,435,880	$2,658,114
Value for week	$130,749	$33,780	.....
Value, 16 weeks	$2,217,220	$440,793	.....

Hudson.—The most important transaction in the Joplin District for several months was the sale on April 16 of the Hudson Mine, together with the mill and the Cornell lease and the Dermott fee of 40 acres to John Morton and other St. Louis men. The consideration is said to be $200,000. The properties were sold by James I. Geddes. The Hudson has been a steady and consistent producer, making its first turn in in October, 1901. The new company intends to spend several thousand dollars in improvements.

ST. FRANCOIS COUNTY.

(From Our Special Correspondent.)

Diamond drilling has started for the season by all the old lead companies, and most of the newer companies.

The new railroad is being surveyed out West to the large group of workings at Palmer, which have been such heavy producers of soft lead in the past.

It is rumored that the Guggenheim interests have secured the new Missouri Southern Railroad, which is building into the lead district from the Southern Illinois coal-fields.

The strike of the miners at Irondale has been called off, and the miners have returned to work on a contract basis that is satisfactory to both sides, though no increase was made in the wage scale.

Derby Lead Company.—The No. 2 shaft struck a water channel and was drowned out last week before additional pumps could be lowered.

Desloge Lead Company.—The new No. 4 shaft, which is 325 ft. deep, was completed in 4 months, one of the quickest jobs on record in this district. The railroad is being extended out to it, over a mile of new track.

The new No. 12, or Hoffman shaft, of the company is still closed down awaiting the completion of shipping facilities.

Federal Lead Company.—The mill has started on full time, adding a large producer in the disseminated lead belt. No jigs are used in this mill, only tables.

National Lead Company.—This company is making a very large output from its present 2 shafts, and is equipping a third shaft, though the mill is much behind the producing capacity of its limited mining territory.

St. Joe Lead Company.—A new blast furnace has been added to the Herculaneum Smelter of this company to take care of the increased output. It makes 5 water-jacket stacks at this plant.

MONTANA.

CARBON COUNTY.

Rocky Fork Coal Company.—The striking coal miners at Red Lodge have resumed work. The men will be hoisted up the slope, but certain restrictions are imposed on the practice.

FLATHEAD COUNTY.

Snowshoe.—At present D. P. Bowers has control of the property, having acquired it from the Pacific Northwest Mining Corporation, a London company, and he has about 30 men sinking to the 500-ft. level and making needed repairs in the concentrator. The shaft is down about 350 ft., and as soon as the 500-ft. level is reached the necessary levels will be run and the concentrator started. The mill has a capacity of about 150 tons of crude ore every 24 hours, and the ore will go about 10 into 1. The values are largely in lead, with gold and silver as by-products, and the concentrates are said to run about $55 to the ton. When in operation and the mill is running, about 125 men are employed. The mine is about 18 miles south of Libby, and it costs $4 a ton to get the concentrates to the railroad.

GRANITE COUNTY.

(From Our Special Correspondent.)

Granite-Bi-Metallic.—The new compressor plant is in operation. The plant, it is thought, will furnish power for 50 drills besides air for all other purposes needed. It was built in St. Louis at the works of L. M. Rumsey & Company from plans and under the supervision of Edward J. Rix, of San Francisco. A 500-h.p. electric motor with rope drive will be used to run the plant. Power for the motor comes from the Flint Creek dam.

Hope.—The old workings are being cleaned up preparatory to resuming work under the new management.

MADISON COUNTY.

(From Our Special Correspondent.)

Copper Chief Mining Company.—This company owns a group of claims not far from Iron Rod. The company is organized under the laws of Washington. H. A. Fosselman, of Spokane, is president. C. M. Whitney, vice-president, and W. D. Vincent, of Spokane, treasurer. The capital stock is $375,000 in 1,500,000 shares of 25c. each. The property is being equipped with machinery.

MEAGHER COUNTY.

(From Our Special Correspondent.)

House Copper Company.—Manager Elton, of Minden, reports that he has over 30 men on the pay roll. The property was recently equipped with hoisting machinery. A concentrating plant is under consideration.

PARK COUNTY.

A. C. Jardine has returned to Jardine from a trip to St. John's, N. B., and other Eastern cities. The mining company of which he is the president and general manager has decided to start work upon a modern 40-stamp gold mill, including an electric plant for motive power and light. It is expected that work will commence at once. For 2 years the company represented by Mr. Jardine has been operating a 10-stamp mill upon the ores produced by the Legal Tender, Siwash, Bear Gulch, Keats and other properties. The Jardine Electric Light, Water and Power Company has about finished its ditch, which is 3½ miles in length, taking water from Bear Creek, to furnish water, light and power for the camp.

(From Our Special Correspondent.)

Scotch Bonnet Mining Company.—Articles of incorporation of this company with a capital of $300,000 in shares of $1 each, have been filed. The company will operate the McKeever Group of claims in the New World District near Cooke City. The officers are M. Olsen, president; J. T. McAviney, vice-president, of the State of Washington, and Thomas McKeever, Cooke City, general manager.

Standard Mining Company.—This company, operating a group of quartz properties near Contact, 50 miles south of Big Timber, is having 2 cars of machinery hauled in. The mines are situated on the Boulder River. The ore is copper and gold and the company will carry on extensive developments the coming summer. Butte and Omaha capital is interested.

SILVER BOW COUNTY.

Minnie Healey.—The Montana Supreme Court has sustained the order permitting the Boston & Montana Company to make an underground survey of the Minnie Healy Mine to secure evidence to be used in a suit brought by F. A. Heinze. Mr. Heinze alleges that certain veins of ore in mines of the Boston & Montana, which adjoin the Minnie Healey, have their spices in the Minnie Healey ground and sues to recover for ore alleged to have been illegally extracted by the Boston & Montana.

Parnall.—In the suit for the sale and partition of this mine brought by the Anaconda Mining Company, Judge Harney last week heard the motion of the Nipper Consolidated Mining Company, of New York, to be made a defendant in the action. In opposition to the motion it was stated by Attorney L. O. Evans that the Nipper Company, of New Jersey, the alleged predecessor in interest of the New York company, had defaulted in the action and the default was entered before the motion was made to substitute the New York Nipper Company as a defendant.

Judge Harney took the motion under advisement.

(*From Our Special Correspondent.*)

Amalgamated Copper Company.—At those mines which were affected by the walkout of the hoisting engineers some 2 weeks ago the places of the old engineers have been all filled by engineers who are fast becoming familiar with the work. No serious accidents have occurred. The properties are producing about two-thirds of the tonnage raised before the trouble, the intention being to gradually work back to the former production, as the new men get accustomed to the work. The Butte Stationary Engineers' Union has stood by the Amalgamated Company, and assisted in getting engineers to take the places of those who struck.

Minnie Healey.—Mr. Heinze is having the pump compartment of the shaft on this property fitted up to use a 2-decker cage for hoisting ore. The 3 compartments of the shaft will then have 2-decked cages.

Original.—The Durkee Electric Drill Company, of Montana, has taken a contract to drive a 400-ft. drift on the 1,400 level of this property. The drift is to be 9 ft. wide and 7 ft. high in the clear.

Smokehouse.—An amended complaint has been filed in court in the suit of George Winter. The action is for a sale and partition of the Smokehouse lode situated in the heart of the business portion of the City of Butte.

NEW JERSEY.

WARREN COUNTY.

Kishpaugh.—After nearly 2 years idleness work at this old mine, near Danville, has resumed. A new shaft is to be put down at the slope known as No. 5, an engine house is being erected and one of the engines is on the ground. P. Pardee, the owner of the mine, expects shortly to have miners taking out ore. Marcus Lusk and George Albertson have taken a contract to sink another slope at one of the old workings. The management expects to be able to ship ore by May 1.

NEW MEXICO.

SOCORRO COUNTY.

(*From Our Special Correspondent.*)

Socorro.—This mine in the Wickenburg District, is now worked by the Socorro Gold Company, which contemplates erecting a 20-stamp mill.

OHIO.

W. P. Rend & Company.—The Continental Coal Company, of Pittsburg, recently organized to engage in the lake traffic in Ohio coal, has purchased the large holdings of W. P. Rend & Company, of Chicago, the most extensive independent operators in the Hocking Valley. The property, which has been formally transferred, embraces 6 mines, with an annual output of more than 1,000,000 tons and much valuable machinery. The price paid for the property was more than $750,000. The Continental Company has also taken over the interests of the Poston-Slater Company and the Price & Patton Company in the Hocking Valley. The acquisition of the Rend property by the Continental Company centers the control of virtually all the important mining properties of Ohio in the hands of three corporations—the Continental, the Pittsburg Coal Company and the Sunday Creek Coal Company.

OREGON.

BAKER COUNTY.

(*From Our Special Correspondent.*)

Bonanza.—The new hoist at this mine is about ready to start. It is the heaviest in the district, and is designed to sink a 3-compartment shaft 2,500 ft. At present the shaft is down 500 ft. The Bonanza is one of the largest producers, and the average output is given as $75,000 a month during 1901.

Columbia.—This mine has resumed work after a shut down of 2 months, owing to a shortage of wood. The shaft is down nearly 800 ft. The company contemplates erecting a $40,000 roaster to facilitate handling its ore. It has 20 stamps, and concentrators and cyanides the tailings, treating 65 tons daily.

Deer Creek.—These placers are all being operated, and from present indications the yield will be much larger than last year, more ground being worked and improved methods used.

Golconda.—At this mine rich ore shoots are reported cut on the 500-ft. level.

New Smelter.—A company has been organized to erect a smelting plant at Sumpter with a daily capacity of 200 tons. Its purpose is making a copper matte. Nearly enough ore to guarantee the success of the enterprise has been subscribed. If successful the furnace would double the output of the district, as many of the base ore properties have not been developed owing to lack of means to treat the ores at a profit. At present such ore running less than $25 cannot be mined profitably.

The smelter erected last fall on the Standard Mine, Quertzburg District, did not prove a success, owing to a shortage of iron. Some system of concentration will be necessary to reduce the percentage of silica.

Olive Creek.—These placers have started with D. McCoy in charge. He is also looking after the Pine Creek Placer.

Pete Mann.—Captain Dubbs, of Denver, Colo., has made a second payment on the purchase of these placers. The water ditch controls the waters of the Greenhorn Range and is the most valuable of any in Eastern Oregon. It is over 30 miles long.

Quebec.—This mine has encountered a shoot of rich ore in the lower tunnel, 3 in. of which runs over $700. An additional 10 stamps will be added to the mill this season.

Stices Gulch.—This placer mine has been purchased by Killen, Warner & Stewart. Work has started under the superintendence of W. S. Kenyon, one of the former owners.

PENNSYLVANIA.

ANTHRACITE COAL.

Two new collieries will shortly be opened near Frackville. At Gilberton the Stanton colliery, which will have a daily capacity of 700 tons, will be put in operation within a short time. Preliminary work has started on a slope for the Crystal Run Colliery, and a breaker with a daily capacity of 800 tons will be erected.

Baltimore No. 2.—After nearly a year of idleness this shaft of the Delaware & Hudson Company, east of Wilkes-Barre, has resumed work. The shaft has been idle ever since the breaker burned down. The coal goes to No. 5 breaker.

Delaware, Lackawanna & Western.—The engineers and pump runners at the Pettebone, Woodward and the Avondale mines, near Wilkes-Barre, were notified last week by the United Mine Workers that unless they joined the strikers within 24 hours their names would be stricken from the rolls of the union. The men signed a contract with the company several weeks ago and decided to keep it. The company has an additional force of men fighting the fire in the Jersey Mine.

BITUMINOUS COAL.

A block of coal territory in Morris Township, embracing nearly 1,200 acres, located near Prosperity, has been sold to Uniontown men. The land owners receive $30 per acre, 1-3 cash, 1-3 in one year and the remainder in 2 years.

All the mines in the West Penn District about Tarentum are closed on account of the miners' strike. The McFetridge Brothers have posted a notice ordering their former employees to remove the tools from the mines. The men employed at 26 mines were ordered out, and all responded. Fully 2,000 miners are idle, and about 500 are at work, the Pittsburg & Buffalo, the Kerr and the Allegheny Coal companies having signed the new scale. The scale is uniform in the 3 veins in the Allegheny and Kiskeminetas valleys.

Dutch Hill.—This coal mine, in Clarion County, has been purchased by Arthur E. Hedstrom and Eugene C. Roberts, of the E. L. Hedstrom Company. The purchase price was about $50,000, and some $30,000 additional will be expended for new machinery. The mine is said to be one of the most important along the Alleghany Valley Railroad. Commencing about June 1, 500 men will be employed. The Hedstrom Company, or members of it, now own 5 mines, 3 of which are at Fairmont and another at Buffalo, Pa.

Ivil.—The fire at this mine, of the Monongahela River Consolidated Coal Company, is beyond control. The men in the mine and the Cattsburg and the Black Diamond mines have been ordered out. The mine has been burning for some time and will be flooded.

Pennsylvania, Maryland & West Virginia Coal and Coke Company.—This company, of Johnstown, with a nominal capital of $1,000, has secured a charter. The incorporators are D. B. Zimmerman and George H. Love, of Somerset, and J. K. Love and W. H. Sunshine, of Johnstown. The company has options on large tracts of coal land in the three States covered by the charter, although it is not expected that the lands in West Virginia and Maryland will be operated at present. The Pennsylvania territory consists of over 5,000 acres in Allegheny County, lying between the Pittsburg & Western and the West Penn railroads. The company will try for lake trade and will send most of the coal mined over the Pittsburg & Western. Gray's Mills is the nearest settlement to the property. A station, tipple and sidings will be built and mines opened. The coal is the Pittsburg vein and is 8 to 12 ft. thick.

Rochester & Pittsburg Coal and Iron Company.—According to the settlement reached last week the 10,000 miners in the Beech Creek field have resumed work. Simultaneously the car shops of the Buffalo, Rochester & Pittsburg Railroad and other industries dependent upon the coal field were re-opened. No further trouble is anticipated during the scale year.

BERKS COUNTY.

Boyertown Ore Company.—William G. Rowe, of Reading, has purchased through Miller D. Evans, all the mineral rights to the iron ore mines in Boyertown. Among the properties secured were the Gabel, Binder, Phoenix, Eckert and Lewis mines. He has also secured mineral rights to various other properties in the neighborhood, aggregating about 200 acres. The purchase was secured for the Boyertown Ore Company, a new organization.

SOUTH DAKOTA.

CUSTER COUNTY.

(*From Our Special Correspondent.*)

North Star Mining Company.—The new 20-stamp mill is nearly completed. A cyanide annex is to be built later. The mine is opened up to the depth of 340 ft., and the vein is said to be 40 ft. wide. The tailings are to be concentrated.

Wabash Mining Company.—Work has stopped in the shaft and an expert is examining the property.

LAWRENCE COUNTY.

(*From Our Special Correspondent.*)

Alder Creek Mining Company.—The 40-ton cyanide plant on Yellow Creek has been started by Superintendent Frasier. The company purchased the Little Blue and adjoining groups of claims, and is cyaniding the quartzite ores. A post-office called Flatiron has been established near the plant.

Belt Development Company.—The southern extension of one of the main Homestake ledges is reported encountered in the drift from the bottom of the 700-ft. shaft. The company is made up of Colorado Springs, New York and Boston men, and was organized 2 years ago by the Crosby-Ehrich Syndicate of Colorado Springs. W. F. Crosby is president, G. A. Worth, vice president; L. R. Ehrich, secretary; J. D. Herring, J. B. Kinsey and G. R. Jewett, of Colorado Springs, and P. A. Gushurst, of Lead, are directors. O. B. Amsden is superintendent at Lead. The company has a bond on 500 acres adjoining the Homestake on the south and has been at work nearly a year. The drift from the shaft ran 500 ft. before reaching the ledge.

Boston-South Dakota Mining Company.—The stamp mill is being enlarged from 20 to 40 stamps, and will soon be finished. A 300-ton cyanide plant in connection is contemplated by the company, the tailings to be conveyed from the plates to the cyanide vats by pipe, after passing through conical separators. The ore is a quartz conglomerate. Titus Corkhill, ex-State mine inspector, of Central City, is superintendent.

Castle Rock Gold Mining Company.—A 40-ft. shoot of cyaniding ore is reported uncovered. It is owned by Spearfish parties, Hiram Dotson of that town being in charge.

General Merritt.—W. E. Sutton, late of California, has taken a lease on this property at Galena, and is preparing to ship silver-lead ores. The property belongs to Samuel Moll, of Galena.

Montezuma.—J. T. Gilmore and others, of Deadwood, owners, are supplying all the flux required at the Deadwood & Delaware Smelter. The ore contains 45 per cent sulphur, 30 per cent iron, and from 1 to 4 per cent copper.

Penobscot Mining Company.—This company is composed principally of Chicago and Michigan men, and is capitalized at $500,000. T. R. Byrns is general manager, and Edward Manion foreman, with headquarters at Deadwood. The company has a bond on the Penobscot, formerly belonging to R. M. Maloney; the Realization, the property of Ernest May and George Johnson, and the Smoky City and Smoky City fraction, located by Sol. Burns and John Little, situated at the head of Blacktail Gulch and near Garden City. One payment has been made, aggregating $30,000. The Realization was not included in this payment, as the examination of the

property has not been completed. There are 500 acres of ground, and the company contracts to pay about $200,000 for it.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Chilkoot and Detroit Groups.—W. W. Challis and associates have given a 3-year bond on the Detroit and 2 years extension on the bond on the Chilkoot to John Barth, of Milwaukee. The terms of the bond require the latter to keep 3 men continuously at work on each property.

Holy Terror.—Twenty stamps of the Keystone Mill are running on ore from the Holy Terror Mine. A header is being driven on the 700-ft. level of the Holy Terror to cut the Keystone ledge. The main office of the company was transferred from Milwaukee, Wis., to Deadwood on April 15, and J. W. Fowler, of Deadwood, has been elected secretary and treasurer.

J. R.—The Cumberland Mining Company has let the contract to sink the shaft 200 ft. deeper, making it over 500 ft. The walls are 30 ft. apart at present, and the intervening material is said to be highly mineralized. H. C. Croeker, of Hill City, is superintendent.

Ohio-Deadwood Gold Mining Company.—Money has been appropriated for an 80-stamp mill on Little Rapid Creek, less than 200 ft. from the mouth of the main tunnel. The company has headquarters at Deadwood.

Tykoon Mining Company.—The air compressor is in place and the company is ready to begin mining. The 20-stamp mill is nearly ready. Water is to be pumped from the creek.

Webb & Chambers Company.—The shaft on the Hawk Wright property in Friday Gulch is 140 ft. deep. The vein is reported 3 ft. wide. Much of the ore contains visible gold.

TEXAS.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Beaumont Oil Field.—Announcements of starting a new well or the coming in of a new gusher create no excitement unless it is in new territory and widens the proven area. Added means of storage and transportation and information regarding new consumers are of more practical value. The Southern Pacific Railway has purchased 250 tank cars of 12,850 gals. capacity each, and many of the cars have already arrived at the loading racks.

Work on the various refineries being built is progressing rapidly and on completion they will handle many thousands of barrels of crude oil daily.

The shipments for the past 3 months are in excess of the total 1901 shipments of 1,750,000 bbls., those for March alone exceeding 800,000 bbls. Many companies now have ample shipping facilities and in addition to the regular tank car lines there are between 800 and 1,000 tank cars owned by local oil companies in service. The iron tank capacity has increased from 2,825,800 bbls. to 4,890,800 bbls. and the number of private tank cars from 325 to 800 or more in the last 3 months.

Operations on Spindletop show a great increase and the number of gushers has grown from 138 to 214. More wells are being drilled at present than at any previous time. There is very little drilling in progress near Beaumont, except at Spindletop. On only three wells is anything being done, and there is no indication of their being producers soon, although they are hundreds of feet deeper than the gushers on the hill.

UTAH.

BEAVER COUNTY.

Majestic Copper Company.—Ten car-loads of copper ore and 2 car-loads of silver-lead ore were received at the sampler in Salt Lake last week. The lead ore is said to be a high-grade carbonate.

IRON COUNTY.

The sale of 7 iron ore claims to Salt Lake men for $175,000 is reported. The buyers were S. B. Milner, Matthew Cullen, Allen G. Campbell, J. R. Walker and M. H. Walker. The Colorado Fuel and Iron Company declined to pay the price asked, though its agent, O. M. Ladd, has been endeacoring to pick up iron ore claims.

SALT LAKE COUNTY.

United States Smelter.—About 100 men are busy about this plant at Bingham Junction. It is expected to be finished by September 1. The powerhouse equipments of engines, generators, etc., will probably be in place within 30 days. The main smelter building is finished. The steel and iron framework and bases of the 6 big blast furnaces are in place and masons are busy on the brick work. The steel framework of the great flue from the smelter building to the 226-ft. stack is more than half in place and the deep and wide sluice-way to carry off the slag is graded out to the slag dumping ground, 200 ft. away. The sampling mill is practically completed and another 30 days will probably see the steam-generating plant completed. The ore-receiving bins have long been finished and on the track below 3 electric motors are ready for work.

SUMMIT COUNTY.

Park Shipments.—Shipments for the week ending April 18 were as follows: Bullion-Beck, 10 car-loads ore; Carisa, 19; Eagle & Blue Bell, 2; Gemini, 9; Grand Central, 7; Lower Mammoth, 4; Mammoth, 7; May Day, 2; Yankee Consolidated, 4; total, 4. Concentrates.—Tesora Mill, 2 cars; May Day Mill, 2; total, 4.

VERMONT

WASHINGTON COUNTY.

The Amalgamated Quarrymen's Union has accepted the proposition made by the Barre Quarrymen's Association, to go into effect on July 1, and to continue for 5 years. Beginning on that date 8 hours will constitute a day's work, with an increase of 10 per cent over the present scale of wages.

WASHINGTON.

FERRY COUNTY.

(From Our Special Correspondent.)

Gold Ledge.—The diamond drill has passed 44 ft. diagonally across the vein, at a vertical depth of about 550 ft. Chas. Theis, president of the company, was at the mine recently and let a contract to drive the tunnel to the vein, a distance of nearly 300 ft. The price per foot is $11.75, the contractors to work on 2 10-hour shifts and provide everything needed but the car track and air pipe.

Roaring Eagle and Black Prince.—These are relocations of the Lake View Mine. Some open cutting on the vein has resulted in the discovery of ore of good value. The new owners have decided on sinking a working shaft 100 ft. and cross-cutting the vein.

Silver Dollar.—This claim adjoins the Trade Dollar on the southeast and the Mountain Lion Mine on the northwest. It has passed into the hands of a Spokane, Wash., syndicate. A new 2-compartment shaft will be started immediately. A company will very soon be formed to operate the property.

Tom Thumb.—The shaft is down 420 ft.

Trade Dollar.—The shaft is down 237 ft.

WYOMING.

CARBON COUNTY.

A smelter will be built at the New Rambler copper mine in the Douglas Creek District at once. The J. H. Montgomery Company, of Denver, has received the contract for the machinery and the plant will be shipped this week. It is expected that the smelter will be in running order in six weeks.

FOREIGN MINING NEWS.

ASIA.

INDIA—MYSORE.

Kolar Gold-field.—The total output of gold in March is reported at 41,575 oz. crude. For the three months ending March 31, the total was 123,240 oz., against 126,230 oz. for the first quarter of 1900; a decrease of 3,080 oz., or 2.4 per cent. The total this year was equal to 110,916 oz. fine gold, or $2,292,634. The March output of the leading mines was: Mysore, 13,535 oz.; Champion Reef, 13,126 oz.; Ooregum, 7,296 oz.; Nundydroog, 4,677 oz.; Balaghat 2,229 oz.

TAMAULIPAS.

(From Our Special Correspondent.)

Mexican National Oil and Development Company.—This company has been formed in Monterey with $1,000,000 capital, to exploit what are believed to be oil lands in this State. The concern is named the Mexican National Oil and Development Company. The officers are: F. M. Kiser, president, Beaumont, Texas; A. F. Denniston, vice-president, Beaumont, Texas; and A. C. Hall, secretary, Corsicana, Texas.

AFRICA.

TRANSVAAL.

We have received the following reports from companies now operating on the Witwatersrand for the month of March: Bonanza, 7,912 tons ore crushed; yield, 7,072 oz. gold, or 0.89 oz. per ton. Crown Deep, 60 stamps, 9,487 tons ore crushed; yield, 4,094 oz., or 0.43 oz. per ton; net profit, £6,100. Crown Reef, 11,378 tons ore milled; yield, 6,176 oz., or 0.54 oz. per ton; total earnings, £26,626; expenses, £14,579; profit, £12,047. Ferreira Deep, 35 stamps, 5,370 tons ore milled; yield, 2,674 oz., or 0.50 oz. per ton; net profit, £4,350. Geldenhuis Deep, 120 stamps, 16,880 tons milled; yield, 7,829 oz., or 0.46 oz. per ton; profit, £15,400. Glen Deep, 30 stamps, 3,940 tons milled; yield, 670 oz. gold, or 0.17 oz. per ton; loss, £1,500. Jumpers Deep, 60 stamps, 10,488 tons milled; yield, 2,341 oz. gold, or 0.22 oz. per ton; profit, £750. Langlaate Deep, 70 stamps, 10,286 tons crushed; yield, 3,980 oz. gold, or 0.39 oz. per ton; profit, £5,200. Nourse Deep, 30 stamps. 4.504 tons crushed; yield, 1,511 oz., or 0.33 oz. per ton; profit, £100. Rose Deep, 75 stamps, 11,200 tons milled; yield, 4,975 oz. gold, or 0.41 oz. per ton; profit, £8,200. All the returns are made in fine gold.

AUSTRALIA.

QUEENSLAND.

The Mines Department reports the total yield of gold in February at 60,809 oz. bullion, equal to 43,654 oz. fine gold. This compares with 68,651 oz. bullion, equal to 50,873 oz. fine gold in February, 1901; showing a decrease of 7,219 oz. fine gold, or 16.5 per cent this year.

Einasleigh Freehold Copper Mines.—This company started up its first furnace recently, a trial run of 1,000 tons of ore being made. The yield was 200 tons of matte, containing 101 tons of copper, 1,307 oz. silver, and a small quantity of gold. The work is at present delayed by difficulties of transport, all the coke used being carried to the mines by camels. Surveys are being made for a tramway to connect the mine with the Chillagoa Railroad at Almaden.

CANADA.

YUKON TERRITORY.

Klondike Mining Conditions.—It is stated that melting snows have formed streams sufficient to permit clean-up operations. The washing out of gold has started and will last 2 months. During the winter the greatest dumps in the camp's history have been thrown up on the banks of creeks, insuring, it is claimed, an aggregate clean-up of $30,000,000. The Dominion Government has ordered the Klondike authorities to throw open for entry 4,000 lapsed and abandoned claims which are withdrawn from the Treadgold concession. The Gold Commissioner's office is rushed with men recording abandoned claims which they have staked.

MEXICO.

CHIHUAHUA.

Hidalgo Mining Company.—A large body of high-grade silver ore (lead sulphide carrying silver) has been cut on the 8th level of the La Morena Mine, property of this company. A large body of silver ore (quartz) is reported being developed on the 8th level of the Presena Mine. The first ore from the Alfarena Mine since the burning of the working shaft 8 months ago, is now being hoisted.

DURANGO.

(From Our Special Correspondent.)

Campania Minera de Penoles.—This company is about to erect and install a new power station, with machinery purchased in the United States. The company recently announced its 77th dividend of $50 a share.

Nueva Australia.—It is reported that this mine at Guanacevi has been purchased by Colorado men for $50,000.

VERA CRUZ.

Albert Schuler, associated with William Vogel, has taken up 9,100 claims in this state, this being the largest number ever granted in Mexico. The claims are mainly for copper deposits.

NEW ZEALAND.

(From Our Special Correspondent.)

Though the dredging industry itself is in a perfectly healthy state, the after-effects of the recent boom are still much in evidence. The share marke is very flat, and a ton of dynamite, to use a miner's phrase, would not shift it. The Otago dredging districts are covered with dredging machinery of all descriptions and half-built dredges, belonging to companies unable to raise sufficient funds to complete a dredge. In many cases this machinery will rust away unused.

Hauraki Gold-field.—The operations of the Waihi Company continue to overshadow those of all others. At the lowest, or No. 7 level of the Waihi Mine, the cross-cut from No. 2 shaft has cut a great body o pay ore, probably 80 ft. thick or more. The Grand Junction Company, adjoining the Waihi Mine, is developing its mine energetically. It has now little or no water to pump, as the Waihi Mine drains the workings.

The latest monthly returns are: Waihi, £41,090 ($205,450), from 12,939 tons; New Zealand Crown, £5,881 ($29,405), from 2,631 tons; Waitekauri, £3,689 ($18,445), from 2,082 tons; Talisman, £3,063 ($15,315), from 2,486 tons; Tairua, £1,920 ($9,600), from 400 tons; Komata Reefs, £1,750 ($8,750), from 1,560 tons; Royal Oak, £1,233 ($6,165), from 8 tons of general ore, and 696 lbs. of picked stone.

SOUTH AMERICA.

BRITISH GUIANA.

The gold exported from the colony for the 3 months ending March 31 was 19,089 oz. crude, a decrease of 186 oz. from the corresponding period last year. The exports this year were equal to 16,139 oz. fine gold, or $333,592.

MINING STOCKS.

(Complete quotations will be found on pages 606 and 607 of stocks dealt in at):

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

New York. April 24.

The copper group is anything but cheerful, as another of the Amalgamated companies, the Boston & Montana, has cut its quarterly dividend to $2. This rate compares with $5 in December last, and $10 in the 3 previous quarters. At the present rate the yield this year will be only $1,200,000, which is $3,300,000 less than was paid in 1901, and $5,250,000 less than 1900. Moreover the 1902 rate is the lowest since 1895. Anaconda is sluggish since the dividend was reduced. The shares sold at 111⅝@113 per cent, or at an average of about $28. Much the same may be said of Parrot, another Amalgamated property, whose dividends are being cut proportionately. Consequently the earnings of Amalgamated have dwindled considerably since its organization, reducing the annual dividend rate from 8 to 2 per cent. The stock sold this week at 64½@66⅜, which compares with $130 less than a year ago.

On curb brokers are paying most attention to the coppers, and report sales of Greene Consolidated of Mexico at $22½@$22; White Knob, of Idaho, at $22¾@$22¼; Tennessee, $10¾@$10½; Aberdeen, of New Mexico, $36⅝@$36¾; British Columbia, $9; Montreal & Boston, $3¼@$2¾; Gold Hill, of North Carolina, at $3@$1½, and Union, in the same State, at $5¾@$3½.

The Homestake Gold Mining Company, of South Dakota, has increased its capital by $1,000,000, making the total $22,000,000. Of the increase there will be placed in the treasury $160,000, while $840,000 will be offered stockholders of record in the proportion of 4 per cent of their holdings on May 15 at the rate of $75 per share, par $100. No scrip or fractional shares will be issued. The proceeds of stock sales will be devoted to liquidating the company's indebtedness for property purchased and improvements.

Sales of Standard Consolidated of California are noted at $3.50@$3.55, and of Brunswick at 21@18c.

The Cripple Creek shares are depressed. Elkton sold down to 80c., as no support is given the stock in Western markets.

A little surprise was caused by the sale of Horn Silver, of Utah, at $1.40, which is the lowest price in some time. Last week $1.62½ was paid.

Boston. April 23.

(From Our Special Correspondent.)

The market for mining shares has been marked by less animation, although prices have held well and many stocks closed higher than a week ago. The fact that the Calumet & Hecla people are known to be out of the metal market at anything under 14 has put many at ease and lends a stability to the situation that has not existed for many months. Again, the continued strength of Amalgamated has given holders of copper shares renewed confidence. It is pretty generally expected that the price of the metal may be advanced at most any time.

The stock market appears to be genuine and manipulation has not been apparent to any extent. Some disappointment is felt that Parrot dividend has not been acted upon and the question is asked if it will not be passed altogether. Up to the present the Calumet & Hecla dividend has not been declared. The stock fell $20 to $560, but has steadied to $566. Osceola has also steadied and is up $2.50 to $65. Old Dominion has lost $2.50, closing at $19. It is expected that a bond issue will be made in order to raise working capital. A $1,500,000 issue has been mentioned but nothing definite has been decided upon as yet.

Bingham Consolidated made a splendid spurt, touching $39.75, but reacted to $36, and closed at $37, which is a net gain of $3.62 1-2 for the week. The advance was rapid and was not in keeping with the ideas of the largest owners of the property. Isle Royale made a low record by selling at $12, with recovery to $13. It closed at $14.50 a week ago. No particular reason can be ascribed for this weakness except that tired holders are offering stock on a market which has not buying orders. Winona took on a burst of activity to-day and rose from $1.50 to $2.50, yielding to $2.25. A report that some rich rock had been struck was not confirmed. An assessment is expected to be called very shortly.

The advance of $3 in Atlantic to $33 in one day was on reports that consolidation with Copper Range Consolidated would be effected, but this was promptly denied. On the increased capitalization the stock is selling on the basis of from $12 to $13 per share. Copper Range Consolidated has held well at from $59 to $61 3-4, closing about $1 above last week at $60.50. There has been considerable profit taking in this stock, but it continues to be one of the favorites.

Dominion securities have been quiet. The Coal Company's stock has receded $5 to $137, but the Steel stock closes 50c. higher at $68, although it sold up to $72.50 during the week.

The old Santa Ysabel Gold Mining property may go over to California people as it is understood that a syndicate in that State has obtained options running for four months at $1 per share. The closing to-night was 25c. bid, 60c. asked. Daly-West has fallen off $4.25 to $43.75. An output of 2,000,000 pounds per month is expected now that the Quincy has been acquired.

The declaration of a $2 dividend by the Boston & Montana Company is a reminder that $5 was paid last December and $10 a year ago. The report issued by the committee appointed to investigate into the affairs of the Osceola Company was more complete than was expected it would be.

Colorado Springs. April 17.

(From Our Special Correspondent.)

The stock markets re-acted to-day after being unsettled more than two weeks. The fractional upswing in prices has come as a lull in the storm, the worst of which it is hoped passed. The week recorded a number of slumps, the declines in almost every instance being due entirely to realizing orders. After halting at $2 last week, Portland took another slide, selling as low as $1.63. Eastern and local selling orders caused the break. Not much weakness appeared in these shares until April 15, when the stock declined from $1.94 to $1.74 in an hour. The day following the shares touched low point at $1.63. A reaction occurred to-day, the closing quotation being $1.72⅛@$1.85, with no stock forthcoming even at the advanced figure. Elkton sold down from 75⅜ to 68⅝c. on selling orders, but recovered later and closes the week in fair shape at 71c. bid, with 72c. asked. Inside buying is assigned as the reason for the new strength of these shares.

El Paso followed the slump of the week by declining from 47c. to 44½c. on the 11th, and has held firm at 43½@44c. during the past few days. The condition of this property is reported to be improving.

Doctor-Jack Pot again came into notice through heavy realizing during the past two days. A week ago these shares sold at 41c. and 40c. A local bank threw a block of approximately 50,000 shares of collateral stock on the market, which was readily absorbed, but at declining prices. The stock broke to 32c., recovering to-day to 35@35¼c.

Golden Cycle has proved to be one of the most satisfactory stocks of the week, and held well between 60 and 64c. The close to-day was weak, however, with 60c. bid. The mine is undergoing heavy development, which is opening large ore reserves in the lower horizons of the mine. Isabella was a notable exception during the week, and showed considerable strength. The shares sold up to 26c. on the continued good report that the mine would earn $3,000 net during the month, instead of sustaining a loss from mining operations.

The prospect list offered few attractions during the week, and was generally unstable in sympathy with the leaders among the mines.

The general impression among well-posted mining men is that bed-rock has been reached, and, while there may be occasional declines, the market as a whole cannot go much lower. The low register of prices now prevailing is attracting considerable home capital, which is being put into the more meritorious stocks.

Salt Lake City. April 19.

(From Our Special Correspondent.)

More sales have been made during the week than were registered during the week previous, and at about the same general figures. The feature of the week has been South Swansea. It was quoted at the opening on Monday morning strong at 70c. high to 61c. low, while at the close of the week before the high was 52c. and low 22c. At the close of this week it stands at 75c. high, 61c. low, with 90,450 shares exchanged.

Daly-West opened at $48.50, but began to sag, later touching $44 on Friday, with short reaction at the close to $45.30; placing 2,363 shares. Consolidated Mercur remains steady at $1.82@1.90, marketing 6,350 shares. Century has surprised many by moving up to 70c. from the opening at 60c., but it slackened off towards the close to 50c., reacting to 55c. California has been a heavy trader but at lower prices than the previous period; 153,300 shares were exchanged between 23 1-2c. and 19c. Yankee Consolidated put out 4,300 shares at $2.59@2.25, a slight raise over the prices of the week before. More than usual activity is noted in Star Consolidated at about 17 1-4@16 3-8c. per share, marketing 16,600 shares, as against 5,800 the week previous. May Day remains steady at 37 1-2@34c., 40,600 shares sold.

The gains all along the line were towards the latter end of the week and this would indicate a higher market at the opening next Monday.

San Francisco. April 19.

(From Our Special Correspondent.)

The market for the Comstocks has been stronger and more active. A sharp advance in the North End stocks opened the week, while other shares followed later. The trading, upon the whole, was the best we have had for several weeks.

Consolidated California & Virginia sold at $1.35; Ophir, $1.10@$1.15; Silver Hill, 50c.; Mexican, 45c.; Caledonia, 42c.; Sierra Nevada, 25c.; Potosi, 21@23c.; Overman, 22c.

The sworn returns filed by the mining companies show cash on hand April 1 as follows, with all expenses paid to date unless otherwise noted: Alta, $31, with indebtedness of $3,234; Alpha Consolidated, $1,167; Andes, $335, with indebtedness of $112; Best & Belcher, $4,670, with liabilities of $17,500 on account of mill purchase; Bullion, $1,549; Caledonia, $5,365, with March expenses unpaid; Confidence, $1,571, with March expenses unpaid; Crown Point, $202, with March expenses unpaid; Consolidated California & Virginia, $57,811; Consolidated Imperial, $467; Challenge Consolidated, $1,378; Gould & Curry, $1,351, with bills receivable of $17,500 and liabilities of $14,827; Hale & Norcross, $1,499; Justice, $241, with liabilities of $4,465; Lady Washington, $14, with liabilities of $2,283; Mexican, $7,428; Ophir, $2,613, with indebtedness of $3,000; Overman, $2,070, with March expenses unpaid; Potosi, $139, with bills payable of $1,000; Savage, $428; Segregated Belcher, $67; Sierra Nevada, $6,539; Silver Hill, $13,648; Standard Consolidated, $120,320, with March clean-up of bullion and March expenses to be accounted for; Syndicate, $3,386; Union Consolidated, $5,201; Utah Consolidated, $387, with $1,000 due bank.

The following companies report indebtedness on April 1: Belcher, $8,000; Chollar, $1,136.

The following named companies in the above list have assessments in course of collection: Crown Point, Consolidated Imperial, Gould & Curry, Mexican, Ophir, Overman, Potosi, Savage, Belcher and Chollar.

On the Oil Exchange trading was good and prices steady. Petroleum Center and some new prospects were especial favorites. Hanford sold at $84; Peerless, $7; Home, $3.65; Sterling, $1.60@$1.65; Four Oil, 53c.; Sovereign, 31@32c.; Clairmont, 22c.; Piedmont, 10c. Among the less familiar stocks, Clairmont found special favor.

Paris. April 13.

(From Our Special Correspondent.)

Conditions are but little changed since last week, and there has been only moderate activity in mining stocks. The South African shares are quiet, with little disposition to buy. There are many sellers ready to take advantage of any rise in prices, and the knowledge of this had a depressing effect. In

DIVIDENDS.

Name of Company.	Latest Dividend—Date.	Per Share.	Total.	Total to Date.
Anaconda Copper, Mont.	May 15	$0.50	$600,000	21,450,000
†Amalgamated Copper	May 26	.50	769,439	18,117,809
Bartolome Mill, Mexico	Apr. 30	.65	1,300	48,700
Boston & Montana Copper	Apr. 17	2.00	300,000	26,525,000
†Central Oil, W. Va.	May 1	.25	15,000	97,500
*Consolidated, Colo.	Apr. 25	.01	19,000	399,000
De Lamar, Idaho	May 8	.72	288,000	2,874,000
Gold Hill Bonanza, Colo.	Apr. 22	.01½	15,000	15,000
*Gwin, Cal.	Apr. 15	.25	25,000	331,000
Mountain Copper	Apr. 24	1.20	300,000	3,393,750
*New Zealand, Colo.	Apr. 25	.01	9,000	138,600
*N.Y.& Hond. Rosario, C. A.	Apr. 30	.10	15,000	1,730,000
*Pacific Coast Borax, Cal.	Apr. 28	1.00	19,000	1,065,500
Penna. Steel, pf.	May 1	3.50	247,500	825,000
*Penoles, Mex.	Apr. 30	21.50	53,750	1,568,738
Quicksilver, pf., Cal.	May 9	.50	21,500	1,909,911
*Rambler-Cariboo, B. C.	Apr. 30	.01	12,500	138,000
*San Francisco Mill, Mexico	Apr. 30	.86	5,160	254,990
*Sta. Maria Guadalupe	May 10	4.30	10,750	336,125
Union Oil, Cal.	Apr. 17	1.35	71,107	260,725

*Monthly. †Quarterly.

ASSESSMENTS.

Name of Company.	Location.	No.	Delinq.	Sale.	Amt.
Coe	Cal.	..	May 19	.....	.25
Con. Imperial	Nev.	..	Apr. 27	May 27	.01
Eureka Con. Drift	Cal.	..	Apr. 9	.....	.05
Gold Hill	Cal.	..	May 22	.....	.25
Gould & Curry	Nev.	98	May 1	May 20	.10
Int'l Copper	Utah	34	Mar. 31	Apr. 31	.00½
Jenny Lind	Cal.	..	Apr. 28	.....	.01
Joe Bowers	Utah.	..	May 12	.....	.01
Larkin	Cal.	20	Apr. 12	May 5	.02
La Suerte	Cal.	..	May 13	.....	.62½
Little Standard Oil	Cal.	3	Apr. 12	May 12	.10
Martha Washington	Utah.	9	Apr. 22	May 10	.01
Occidental	Nev.	..	May 12	June 5	.05
Old Colony & Eureka	Utah.	2	Apr. 16	May 2	.00½
Old Evergreen	Utah.	1	Apr. 5	May 3	.03
Ophir	Nev.	..	Apr. 14	May 6	.15
Overman	Nev.	10	Apr. 8	Apr. 29	.10
Potosi	Nev.	62	Apr. 16	May 7	.05
Savage	Nev.	106	Apr. 15	May 6	.10
Tanana	Cal.	5	Apr. 7	Apr. 29	.10
Tintic	Utah.	..	Apr. 10	Apr. 28	.00½
Tomboy	Utah	..	Apr. 19	May 19	.00¼
Va. Con.	Cal.	12	May 5	May 26	.02
West Morning Glory	Utah.	11	May 15	.....	.01
Yellow Jacket	Nev.	11	May 10	June 19	.10

the copper stocks there has been some movement, especially in Rio Tintos. The metallurgical stocks are generally unchanged. There has been some buying of Le Nickel, which remains at a high figure.

In my last letter I sent you the figures for the production of wrought iron and steel; the details of this output have now been published by the *Comité des Forges*. The wrought or puddled iron production was as follows, in metric tons:

	1900.	1901.	Changes.
Puddled iron	416,059	357,512	D. 58,547
Charcoal forge iron	6,193	4,761	D. 1,432
Rerolled from scrap	286,022	192,036	D. 93,986
Total	708,274	554,309	D. 153,965

The forms in which this iron was put on the market were, in 1901: Rails, 315 tons; bars, beams, and special shapes, 501,928 tons; plates and sheets, 52,066 tons.

The total production of steel in ingots and castings was as follows, in metric tons:

	1900.	1901.	Changes.
Converter	919,283	860,425	D. 58,858
Open hearth	645,881	604,646	D. 41,235
Crucible, etc.	24,895	18,662	D. 6,233
Total	1,590,059	1,483,733	D. 106,326

The finished steel made—including 8,020 tons of old steel re-rolled—consisted of 296,431 tons of rails; 580,376 tons of bars, beams, angles, and shapes; 274,363 tons of plates and sheets; a total of 1,151,170 tons.

Of the 2,400,240 tons of pig iron reported in 1901, there were 2,369,451 tons made with coke or coal, and 30,789 tons with charcoal or with mixed charcoal and coke. The iron classed as foundry iron was 596,625 tons, the remainder being forge iron, bessemer and basic pig.

The decline in production was generally expected, in view of the diminished activity of our iron and steel works last year, and the general state of business. It is in accordance with the conditions in all other European countries. AZOTE.

London. April 12.

(From Our Special Correspondent.)

The market in South Africans has been quite stagnant this week, though some interest was aroused by the news that the Boer leaders were conferring on the subject of peace. It cannot be said that this news had any substantial effect on the market, as it is generally considered that the Boers' terms will be unacceptable and their demands too great. A peace patched up by bargaining is not popular in the City, for it would not mean permanent security and prosperity. Nothing but the prosecution of the war to its natural end and the reconstruction of South Africa by English administrators independent alike of the gold mine magnates and the Boers would be acceptable to the average city man. Any activity in gold and diamond shares that there may be is entirely fictitious and emanates from the controlling houses, who are trying to raise a market in their wares. As I have often mentioned in these letters, there is very little chance of quotations advancing at present, for there are so many shareholders who went in just after the war began and when we thought it would last at the most three months, who are now desirous of realizing directly any profit is shown. Until these shareholders have cleared out there is little chance of any permanent rise.

The general flatness of the mining market is very disconcerting to brokers, speculators and promoters. There is nothing new to boom. Klondike and the Gold Coast have quite lost their glamor, the failure of the Whitaker-Wright group has made British Columbia unpopular and the Stratton's Independence collapse has had the same effect on all propositions from the United States. Then the continued volcanic eruptions in the management of certain West Australian mines has made the public rather tired of that goldfield, and the attempts to bring China within the horizon of the speculative mining market have so far been of no avail. It must also be remembered that there is less surplus money floating about the country nowadays, owing to the increased taxation for the war. Altogether, the outlook for the mining market is not at all bright at present.

I have several times mentioned the Etruscan Copper Estates, Limited, a company which was recently formed to acquire large deposits in Italy. There is no doubt that large bodies of ore exist, but much of it is low grade, and other parts are so mixed with blende and other minerals that the method of treatment is not at all certain. The shares are being sold rapidly, at high prices, by the promoter, and this month a heavy debenture debt has been created. Owing to the uncertainty as to treatment, Mr. Alexander Hill, who used to be at Rio Tinto, and more recently will be remembered in America in connection with the Mountain Copper Company, and with the Ray Copper Mines, was sent two months ago to examine the mine and the ores. Mr. Hill has made his report, but the directors are not inclined to publish it, so the shareholders and the public naturally conclude that the report is not favorable. Like most mining companies brought out in England, the sale of shares and making of a market on the Stock Exchange for vendors' shares are the chief considerations, but from personal knowledge I can say that in this case the working of the mine on scientific principles it not being neglected, but that every effort is being made to obtain the best advice as to treatment. Whether the company with its high capitalization and heavy debenture debt will ever recoup shareholders who acquired shares at a big premium is, however, very much open to doubt.

COAL TRADE REVIEW.

New York. April 25.

ANTHRACITE.

The demand for anthracite is very active and more than sufficient to take the total current output of the collieries. This does not mean that the output this month will exceed the record of last April since a number of conditions tend to restrict production. Car supply is insufficient on about all the anthracite roads and on some is far below the demand. The anticipated improvement seems to be coming, but it is coming slowly. At a few collieries there are strikes and the miners are out. At other collieries the miners are not out, but are systematically taking things easy. In fact, throughout the anthracite region the present efficiency of the miners is below what it was prior to the strike in 1900. Another restriction on production is the condition of many mines, particularly in the Lehigh and Schuylkill regions, as a result of the floods of last winter. A vast amount of repair work has been necessary to put the flooded workings in proper shape again.

The total output this month may amount to nearly 5,000,000 tons. The total production for March is given as 3,818,767 tons, a good showing, considering the damage done by floods. The total output for the first quarter of the year is 12,098,158 tons.

The National Civic Federation has duly advertised the fact that it has been in consultation with the representatives of the operators and of the United Mine Workers, and that its conciliation committee will hold a conference with the representatives in New York City on April 26. So far nothing has developed to show that while the conference may bring out radical differences of opinion the outcome will not be peaceful. It is safe to say that neither operators nor miners desire a prolonged strike and as the miners have secured what they may consider due recognition differences as to wages should be adjusted with a little discussion.

Trade in the Northwest is generally quiet. But little anthracite has arrived at the head of the lakes yet, owing to the great demand there for bituminous and receipts of anthracite will probably remain light for some weeks. In Chicago territory buying is active and a considerable tonnage of Lake coal has already arrived. The total receipts by Lake for the month should come close to 75,000 tons, something of a contrast to April, 1901, when not a ton reached the docks. Shipments from the docks are light, but rail coal is in very fair demand and shipments to outlying territory are satisfactory. Along the Lower Lakes and in the all-rail trade the demand is brisk, while receipts are none too heavy. As last week, demand is heaviest along the Atlantic seaboard, and a lot of coal is in transit to New England ports. Egg, stove and nut are most wanted of the prepared sizes. The advance of 25c. per ton on broken may affect sales, but prophesies are out of order thus early in the season. Dealers at Boston are eager to get coal at April prices, but the demand is so heavy that a heavy tonnage order cannot be delivered. With the coming of warm weather retail trade is generally quiet. April prices for free burning white ash coal f. o. b. New York Harbor points are: Broken, $3.75; egg, stove and chestnut, $4.

BITUMINOUS.

In the Atlantic seaboard soft coal trade demand is still strong in most consuming territories. The amount of coal coming to tidewater is less than a week ago, as a result the market is firm and the downward tendency of prices is temporarily checked. The reasons for the falling off in tidewater tonnages are poorer car supply and slower transportation from the mines. The railroads after giving the collieries fully 75 per cent of the total number of cars wanted and promising a continuation of the same supply with possibly an improvement later, have failed to get the empties to the mines, and conditions are apparently getting back to where they were several weeks ago. In the matter of rail transportation coal is coming through to tidewater slowly and irregularly. Various explanations are given for the unsatisfactory service.

At points beyond Cape Cod coal is in great demand and a considerable tonnage is being shipped there. Along Long Island Sound the market is strong and consumers who cannot get sufficient supplies of the better grades are filling in with the poorer grades. At New York Harbor points the trade is in an easy condition. Most consumers are able to get what coal they need with little trouble. In the all-rail trade the stringency continues. Consumers have difficulty in supplying their wants and shippers have not yet turned their attention from tidewater to all-rail business.

Transportation from mines to tidewater is slow and irregular. Car supply at the mines is now averaging about 60 per cent of the demand. In the coastwise vessel market vessels are still in demand and rates are fairly firm. We quote current rates from Philadelphia as follows: Providence, New Bedford and Long Island Sound, 75c.; Boston, Salem and Portland, 90c.; Portsmouth and Bath, 95c.; Wareham and Lynn, $1; Newburyport, $1.05; Saco, $1.05 and towages; Gardiner, $1 and towages.

Birmingham. April 21.

(From Our Special Correspondent.)

There is demand for a large quantity of coal, and consumption at the furnaces is heavy.

The Sloss-Sheffield Steel and Iron Company is rushing the work on their new mines at Flat Top Mountain, in Walker County. The 500 convicts now being worked at Coalburg, Jefferson County, will be removed, Governor W. D. Jelks making a personal visit to the Coalburg prisons recently to investigate the health conditions of the camp. The Sloss Company announces that the opening of the new property and the change of convicts will entail an additional expense of $250,000.

The miners will continue to receive the maximum wage, 55 cents per ton for the balance of their contract, to June 30. The Coal Operators' Association, composed of all the operators in the State, held a meeting April 22 to consider conditions and formulate plans for the coming conference with the miners.

Chicago. April 22.

(From Our Special Correspondent.)

Wholesale dealers in coal predict that April will show the heaviest sales of anthracite of all months in the current year. Retailers are buying eagerly at $5.50 and some firms report scarcity of coal as a consequence, but the continued receipts by boat are expected to replenish the supply soon. There is not a little complaint about the condition of the Chicago River; navigation has been open not two weeks yet, but already five large vessels have become grounded on the Washington street tunnel, necessitating in each case several hours' delay of cargo and blocking river traffic for several hours until the boat was released. The operation of the Drainage Canal, which is fed through the river, makes the depth over the tunnel variable; there exists 21 ft. of water on both sides of the tunnel and throughout the Main River and the South Branch, but it has become necessary for the city authorities this week to give orders that vessels loaded to more than 16 1-2 ft. shall not attempt to pass the unnel. When a boat is caught on the tunnel the flow through the Drainage Canal has to be stopped, ordinarily, for its release, but this year much trouble is being had on account of the fact that the city of Joliet is now supplied with light and power from the operation of the canal, and stopping the flow means injury to that city. The Washington street tunnel has been for many years a great obstruction to navigation, and its effects now seem likely to bring about a general demand from the coal and lumber interests along the South Branch for its removal. Meanwhile there is being renewed the proposal to build new controlling works for the canal at Chicago instead of 34 miles from the lake; such works would allow the stopping of the flow within a few minutes instead of nine or ten hours, and are not unlikely to be built if political complications preventing the removal of the tunnel continue.

The bituminous coal trade is still on the anxious seat about prices for the summer, and quotations are of doubtful value. All grades are plentiful. Sales of Hocking are said to have been made as low as $2.75, though quotations are 40@50c. higher; Indiana block remains at $2.45; Indiana semi-block, $2.10; Clinton lump, $1.90; Indiana lump, $1.80; Northern Illinois run-of-mine brings $1.70; Southern Illinois run-of-mine, $2. There is a light demand for smokeless coals at $3 for run-of-mine and $3.15@3.25 for lump and egg. It is expected by the trade that within the current week summer prices will be settled and that business will then be somewhat brisker, though the natural slackness of the spring season has been aggravated by the last three days of unusually warm weather.

Cleveland. April 22.

(From Our Special Correspondent.)

The lake coal situation is really becoming deplorable. The south shore of Lake Erie is jammed with boats waiting for cargoes which cannot be supplied. One boat, controlled by one of the big shippers, has been at the dock at Ashtabula for the last six days and has not received her cargo yet. Other boats are

in the same predicament. The shippers expected a general relief from the stress of the market with the opening of this week, but it did not come. The coal supply lessened instead of increasing, and shippers are worse off than ever. The demand for coal at the upper lake ports is quite heavy and the supply is constantly decreasing. The difficulty here seems to be in the shortage of railroad equipment, no one of the roads having cars enough to keep the trade moving, or if the cars are available, motive power is lacking. The market has been so quiet this week that there has been no discussion of rates and the old ones apply by mutual consent, 35c. to the head of the lakes and 45c. to Milwaukee.

Pittsburg. April 23.

(From Our Special Correspondent.)

Coal.—The strike of the miners in the West Penn Railroad field is the most important feature in the coal trade in the Pittsburg District this week. About 1,700 miners are idle and fully 20 mines are closed. The district officers of the United Mine Workers presented a uniform scale which was ignored by all the operators except six who employ about 800 men. The strike is affecting the plants of the American Sheet Steel Company at Vandergrift, Leechburg and Apollo. All shipments of coal from other sections of the district to those plants have been stopped. Almost all the industries along the West Penn Railroad are crippled by the strike. It is estimated that fully 2,000 miners can secure employment in this district, and it is impossible to get men to take the places of the strikers at the low rates offered. The demand for coal is increasing but there has been no change in prices.

Connellsville Coke.—There has been an advance in prices and furnace coke is now quoted at $2.50 and foundry at $3@3.25 for the second half. A premium is being paid in some instances over these prices for prompt shipment. The car supply is better this week but the production is about the same as last week. The *Courier* in its last issue gives the production for the previous week at 220,487 tons. The shipments for the week aggregated 11,357 cars, distributed as follows: To Pittsburg and river tipples, 3,800; to points west of Pittsburg, 5,565 cars; to points east of Connellsville, 1,992 cars. This was an increase of 265 cars over the shipments of the previous week.

Foreign Coal Trade. April 24.

Export trade continues quiet, with no large contracts reported. Coal is in freer supply at the seaboard, and serious interruptions to delivery by the railroads are over for the season.

A charter is reported from Norfolk, Va., to Manila at $5 per ton, May sailing. The rate is 75c. less than on charters made in October and November last.

Exports of fuel from Great Britain for the 3 months ending March 31 were in long tons:

	1901.	1902.
Coal	8,928,331	9,243,955
Coke	174,945	136,503
Briquettes	216,775	237,930
Total	9,320,051	9,618,388

In addition to these exports there were 3,394,570 tons of coal sent abroad for the use of steamers engaged in foreign trade, against 3,014,521 tons in the first quarter of 1901.

Exports of fuel from Germany for the two months ending February 28 were as follows, in metric tons:

	1901.	1902.	Changes.
Coal	2,392,996	2,365,177	D. 27,819
Brown coal	4,188	2,926	D. 1,262
Coke	371,197	301,570	D. 69,627
Briquettes	88,577	122,376	I. 33,799

Imports for the same period were as follows:

	1901.	1902.	Changes.
Coal	646,421	673,223	I. 26,802
Brown coal	1,139,765	993,780	D. 145,985
Coke	69,516	66,459	D. 3,057
Briquettes	19,427	12,054	D. 7,373

Imports of coal from the United States this year were 17,265 tons, against 348 tons in 1901.

According to the Hungarian *Export Review*, the production of coal in Hungary has grown from 3,640,000 metric tons in 1892 to 6,350,000 tons in 1901. During the same period, the imports of coal have increased from 915,000 tons to 1,330,000 tons, while the exports have advanced from 92,000 tons to 444,000 tons. The consumption of coal in Hungary in 1892 was estimated at 4,460,000 tons, and in 1901 at 7,236,000 tons.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of April 12 that the tone of the Welsh coal market is again firmer, several collieries being fully stemmed for April shipment and tonnage being plentiful. Quotations are: Best Welsh steam coal, $3.72@$3.84; seconds, $3.66; thirds, $3.36; dry coals, $3.24; best Monmouthshire, $3.36@$3.42; seconds, $3.12; best small steam coal, $2.16; seconds, $1.95; other sorts, $1.74.

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

The general tone of the freight market is unaltered and rates show little quotable change. Some rates named from Cardiff are: Marseilles, $1.36; Genoa, $1.38; Naples, $1.32; Singapore, $2.76; Las Palmas, $1.50; St. Vincent, $1.68; Rio Janeiro, $2.88; Buenos Aires, $2.76.

CHEMICALS AND MINERALS.

(For further prices of chemicals, minerals and rare elements, see page 608.)

New York. April 25.

Heavy Chemicals.—There is a good seasonable demand for most products at rather steady prices. Domestic chemicals, we quote, per 100 lbs., f. o. b. works, as follows: High-test alkali, 80@82½c. for prompt shipment, and 75@77½c. for forward; caustic soda, high-test, $1.90@1.92½ for early delivery, and $1.85@$1.87½ for futures; bicarb. soda, ordinary, $1, and extra, $3; sal soda, 55c.; chlorate of potash, $8@$8¼ for prompt, and $7.75 for contracts. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90@92½c.; caustic soda, high-test, $2.25; sal soda, 65@67½c.; chlorate of potash, $10¼@$10¾; bleaching powder, $1.55@$1.75, according to make and seller.

Acids.—Warmer weather has brought more orders for sulphuric acid from the soda-water trade. A larger consumption in the metal refining industry is also noted. Blue vitriol is improving in demand, though prices for export continue fractionally lower than are quoted on domestic business. At present the c. i. f. price is less than $4 per 100 lbs.

Exports of copper sulphate from New York in the quarter ending March 31 compare with the corresponding period last year as follows:

Destination.	1901.	1902.	Changes.
Austria	2,117,741	2,134,205	I. 16,464
Belgium	49,152	33,750	D. 15,402
France	609,788	550,819	D. 58,969
Germany and Holland	504,061	631,506	I. 127,445
Greece	.....	814,365	I. 814,365
Italy	14,443,001	7,355,312	D. 7,087,689
Portugal	1,263,123	24,940	D. 1,238,183
Russia	304,835	.....	D. 304,835
Total Europe	19,291,701	11,544,897	D. 7,746,804
Africa (French)	164,943	169,172	I. 4,229
Australia	2,420	.....	I. 2,420
Bermuda	400	5,100	I. 4,700
Argentina	240,825	283,300	I. 42,475
Chile	46,350	15,000	D. 31,350
Nicaragua	450	.....	D. 450
Uruguay	20,700	.....	D. 20,700
Venezuela	.....	4,330	I. 4,330
West Indies	1,412	4,379	I. 2,967
Mexico	148,544	79,683	D. 68,861
Nova Scotia	4,726	.....	D. 4,726
Total, lbs.	19,922,471	12,105,861	D. 7,816,610
Total value	$896,736	$485,942	D. $410,794
Average per 100 lbs.	$4.50	$4.01	D. $0.49

The falling off in exports this year is equal to nearly 40 per cent, owing principally to curtailed consumption in Italy. It is noteworthy that we are building up a good trade in Greece, and certain South American countries. The lower invoice value per 100 lbs. this year is due chiefly to the cut in the market price of copper.

The exports of copper sulphate from Great Britain in the quarter ending March 31 were 13,580 long tons, against 19,539 tons in the same period last year, showing a decrease of 5,959 tons, or about 44 per cent.

Brimstone.—Arrivals at New York this week were 2,545 tons, nearly all of which is under contract to consumers. Spot best unmixed seconds are quoted around $23 per ton, and shipments about 50c. less. Best thirds hold at $2.50 per ton less than seconds.

Imports of brimstone into Great Britain in the quarter ending March 31 were 5,372 tons, against 6,095 tons in the same period last year, showing a decrease of 723 tons.

Pyrites.—The Pennsylvania Salt Manufacturing Company imported 3,129 tons Spanish copper pyrites at New York this week. The metallic content of this ore is a fraction over 2 per cent copper. Last year the shipments of pyrites from the Rio Tinto and Tharsis mines in Spain to all countries aggregated 1,013,347 tons, which is 50,728 tons less than in 1900.

Imports of pyrites into Great Britain in the quarter ending March 31 were 172,564 tons, against 184,088 tons last year, showing a decrease of 11,524 tons, owing to the smaller demand for sulphuric acid.

Quotations are f. o. b.: Mineral City, Va., lump ore, $5 per ton, and fines, 10c. per unit; Charlemont, Mass., lump, $5, and fines, $4.75. Spanish pyrites 12@13c. per unit, New York and other Atlantic ports. Spanish pyrites contain from 40 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—Shipments from Great Britain to the United States in March were about 954 tons, making a total of 3,536 tons for the first quarter this year. The market continues firm at $3@$3.02½ per 100 lbs. for 24@25 per cent gas liquor.

Nitrate of Soda.—Quiet. The steamer *Cacique*, with 28,500 bags, is unloading at Baltimore, and the *Cumbal*, with 43,500 bags, is expected at New York on April 30. Consequently, the market is easier and lower prices are looked for. Spot and nearby arrivals are held at $2.25 per 100 lbs., while for July to December delivery $2 up is asked.

Advices from Chile give the shipments during the combination's first year—ending March 31, 1902—at 1,308,000 long tons. This total is 105,000 tons less than was intended, and so must be added to the second year's quota, which "shall not be less than the total consumption in the 12 months from May to April, inclusive."

Concerning the situation in the Chilian market we are advised by Messrs. Jackson Brothers, of Valparaiso, under date of March 8, as follows: Although the advices from consuming markets have been anything but encouraging producers have not shown any inclination to give way on their former prices and have even obtained a slight advance for early deliveries which are apparently becoming scarce. March-April, 95 per cent, fetched 6s. 8½d.@6s. 9d, while 5,000 tons for next December delivery were placed at 6s. 9d. alongside. For the refined quality there has been some demand, 6s. 11d. being paid for March-April, and 6s. 9d. for June-July, steamer terms. The shipments during February have been smaller than expected, owing to the extremely strong surf experienced and still prevalent along the whole of this coast since February 22. The exports in February were 2,156,000 qtls., making 4,079,000 qtls. for the two months of this year, against 4,334,000 qtls. last year. We quote, 95 per cent March-April, 6s. 8½d.; April-July, 6s. 8d.; August-October, 6s. 8½d.; and 96 per cent, March, 6s. 10½d.; April, 6s. 10d., and July-December, 6s. 9d., all ordinary terms sellers. The price of 6s. 8½d., with an all round freight of 17s. 6d., stands in 8s. 4¼d. per cwt. net cost and freight without purchasing commission. Reported sales for the fortnight ending March 7 were 502,700 qtls., and resales, 184,000 qtls.

Magnesite.—Imports of Greecian magnesite recently were the steamer *Roth* at Philadelphia, with 5,000 tons, and the *Alagonia* at New York, with 4,000 tons. Both these cargoes will be delivered on contract. Efforts are being made to extend the use of this mineral in the steel industry, for lining furnaces. Crude magnesite has sold at $5.90@$6 per long ton, while calcined is worth about $14 per short ton.

Phosphates.—The industry is in good condition, and more capital is being invested, especially in Tennessee, where some large sales of land have recently been made. It is noticeable that the industry is gradually passing into the control of a comparatively few companies. Already the Florida and South Carolina fields are under close control, and the time is not far distant when the Tennessee deposits will be also. One result of this centralization movement is the maintenance of prices both for home and foreign trade. Moreover, the phosphate industry has grown in importance, and to-day the world depends largely on us for its supplies. In fact a large percentage of our annual production of phosphates is taken by Germany and other superphosphate manufacturing countries.

We quote phosphate prices below:

Phosphates.	Per ton F. o. b.	C. i. f. Un. Kingdom or European Ports. Unit.	Long ton.
*Fla. hard rock (77@80%)	$7.25@7.50	6¼@7d	$9.75@10.92
*Fla. land peb. (68@73%)	3.00@3.25	4¾@5d	6.65@ 7.00
*Fla. Peace Riv. (58@63%)	2.25@2.50	4¾@5d	5.70@ 6.00
†Tenn., (78@80%) export	3.50	5¾@6¼d	8.97@ 9.77
†Tenn., 78% domestic	3.00@3.25	.....	.....
†Tenn., 75% domestic	2.75@3.00	.....	.....
†Tenn., 73@74% domestic	2.40	.....	.....
†Tenn., 70@72% domestic	2.10@2.25	.....	.....
‡So. Car. land rock	3.25	4½@5d	5.67@ 6.30
‡So. Car. river rock	2.75@3.00	.....	.....
Algerian, rock (63@70%)	.....	6@6½d	8.04@ 8.70
Algerian, rock (58@64%)	.....	5@5¼d	6.00@ 6.30
Tunis Gafsa (58@63%)	.....	5@5¼d	6.00@ 6.30

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

The freight market is firmer. From Fernandina to Ghent, Belgium, May sailings are held at 13s. 6d. ($3.24). The shipments to this port are improving; last year 22,205 tons Florida rock were sent there, as against 12,725 tons in 1900.

The imports of phosphates into Great Britain are somewhat less than last year, owing to the smaller fertilizer consumption. In the quarter ending March 31 the imports were 74,394 tons, as against 89,399 tons in the corresponding period in 1901.

Liverpool. April 9.

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

There has been more doing of late in several lines of heavy chemicals and prices are steady all around.

The exports of bleaching powder and sodas for the month of March, as taken from the Board of

Trade returns, are as follows: Bleaching powder—Shipments to United States, 68,462 cwts.; other countries, 15,444 cwts.; total, 83,906 cwts. Soda compounds—Soda ash, 111,932 cwts.; caustic soda, 104,645; bicarb soda, 22,490; soda crystals, 11,746; sulphate of soda, 38,602; other sorts, 21,772; total, 311,187 cwts.

The exports of both bleach and caustic soda show an improvement over the previous month, and are also larger than for the corresponding month of last year, which is somewhat more satisfactory than might have been anticipated.

Soda ash is in demand at usual varying prices as to market. We quote nearest spot range for tierces about as follows: Leblanc ash, 48 per cent, £5 15s. @£6; 58 per cent, £6 2s. 6d.@£6 7s. 6d per ton, net cash. Ammonia ash, 48 per cent, £4 5s.@£4 10s.; 58 per cent. £4 10s.@£4 15s. per ton, net cash. Bags, 5s. per ton under price for tierces. Soda crystals are in fairly good request at generally £3 7s. 6d. per ton, less 5 per cent for barrels, or 7s. less for bags, with special terms for certain export quarters. Caustic soda has been selling more freely and quotations are firmly maintained as follows: 60 per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent £10 5s.; 76 per cent, £10 10s. per ton, net cash.

Bleaching powder continues dull, but steady at about £6 15s.@£6 17s. 6d. per ton, net cash for hardwood packages; with special quotations for Continental and a few other export markets.

Chlorate of potash is still dull and featureless, although values are nominally unchanged at 3d.@3⅛d. per lb. net cash.

Bicarb soda is moving off to a fair extent at £6 15s. per ton, less 2½ per cent, for the finest quality in 1 cwt. kegs, with usual allowances for larger packages, also special terms for a few favored markets.

Sulphate of ammonia is scarce and strong in tone, holders now quoting £12 7s. 6d.@£12 10s. per ton, less 2½ per cent for good gray 24@25 per cent in double bags f. o. b. here.

Nitrate of soda on spot has to-day been advanced to £11 per ton, less 2½ per cent for the best quality in double bags f. o. b. here.

Messina, Sicily. March 31.

(Special Report of Emil Fog & Sons.)

Brimstone.—During February exports to the United States were again greatly in excess of last year, being 16,000 tons, against 5,000 tons. For France and Italy, however, a great reduction in consumption during the last 12 months is noticeable, shipments to these 2 countries having decreased by almost 70,000 tons, whereas trade with the United States has been restored to previous figures by the heavy shipments during January and February. It is very consoling that this decline in consumption affects only the wine-growing countries, not the pulp trade. The former cannot use pyrites, but the latter can. This decline may therefore be only temporary, owing to the over-production of wine last year, and once this crisis is over may disappear. But will the pulp mills refrain from using pyrites also in future? As the saving by using the latter amounts to about 30 per cent we are afraid they will not. The indifference shown by the board of directors of the Anglo-Sulphur Company, in London, is incomprehensible, for once the pulp mills change their plants it will mean a yearly loss to Sicily of about 100,000 tons brimstone. Meantime prices continue to be maintained. The Anglo-Sulphur Company has turned a willing seller and would make concessions, but only for large quantities. In face of the uncertainty of the future speculators have quite disappeared and purchasers are made only for immediate wants. Present prices are likely to be maintained till July or August, the time of the new melting, when the resumption of offers by dissidents may produce some small temporary decline. We quote, per ton, f. o. b., as follows: Best unmixed seconds, 84s.; best thirds, 74s. 6d; current thirds, 70s. 6d.; refined block, 86s. 3d.; roll, in casks, 95s. 3d.; flowers, pure, in bags, 102s. 9d.; flowers, current, 93s. 9d.

Freights to New York and Boston are 8s.; Baltimore and Philadelphia, 8s. 6d.; Baltic ports, 9s., and Canadian, 7s. 6d.@8s.

IRON TRADE REVIEW.

New York. April 24.

The activity in the iron and steel trade continues undiminished. The pressure for structural steel especially is very great, as builders are putting in their requirements for the season, and many of them have apparently taken no account of the condition of the market. The supplies of steel are still insufficient, and orders for German billets are running up into considerable quantities. Under these conditions so many premiums are paid for early deliveries that it is difficult to say what prices are; though there are no changes on long contracts. Some buying which has a speculative appearance is reported, especially in the Philadelphia market. Some foundries in the East and in the Chicago District are running out of stock, and are paying extra prices to get what iron they need to fill orders.

Birmingham. April 21.

(From Our Special Correspondent.)

The quotations are being maintained on a $12 basis for No. 2 foundry, with nothing under $2 per ton for premium on immediate delivery orders. The statement made that some furnaces in the district had been taking orders for No. 1 foundry, early delivery, at $16 per ton is not corroborated. The furnace companies are not now in position to sell much iron ahead, except for the last two months of the year. Some heavy shipments are being made from this district, and there is a good demand for cars.

The Tennessee Coal, Iron and Railroad Company blew in one furnace at Ensley the past week, but will probably have one of the others to go out for repairs. The production is about holding its own. The big, new furnace of the Republic Iron and Steel Company is to go into operation within the next week or so.

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

Local consumers announce that the furnace people are protecting them in their wants. There is activity in finished iron and steel circles in this State. All the steel plants, rolling mills and other factories are giving steady employment to a large complement of hands. There is complaint again that labor is not plentiful. However, efforts are being made to relieve this situation. The Tennessee Company and others are building houses around their plants to supply homes for labor being brought into the district.

The supply of raw material for the furnaces is becoming easier, as new labor is being brought in. The labor agents are yet working on their orders.

Buffalo. April 23.

(Special Report of Rogers, Brown & Co.)

The temporary stoppage of some of the furnaces in this district, on account of their inability to obtain coke, has stirred up a heap of trouble and has demonstrated most emphatically that foundries are running from day to day with practically no stock on hand and that the least cessation in shipments by furnace companies plays havoc with their customers, causing many to shut down. This condition of affairs is most embarrassing to all concerned, and while a healthy demand is always desirable some relief from the present extreme tension would be welcomed by all. During the past week some good-sized orders at full prices have been taken for delivery during the last few months of the year by one or two of the furnaces who have enough of their product unsold to be counted still in the ring.

Chicago. April 22.

(From Our Special Correspondent.)

Hardly any change from the conditions of last week is apparent in the pig iron market; sales are being made for the last quarter of the year at $19 for Northern No. 1 and $18.50 for Northern No. 2; Southern is practically at the same price, or perhaps 50c. per ton less for actual sales. Lake Superior charcoal is in great demand, but only a very little is to be had at $22@22.50. Buyers appear to be coming to the conclusion that there is little use in holding off for prices to decline and the indications are that in another month the furnaces will be pretty well sold out for this year. The propensity of foundrymen to believe that lower prices will come with warmer weather is declared by pig iron producers to be due to circumstances of the market apart from seasons—there is more likely to be an advance than a decline in the coming summer, to all appearances. The iron market is sensitive to business and political changes and hardly anyone expects, in the very nature of things, that prices will remain stationary long.

Coke continues to come in more freely and in general the railway situation may be said to be better, though coke is hardly yet abundant. The supply of Connellsville alone is scanty; no complaint is made about the product of West Virginia ovens. The price remains at $5.50.

Cleveland. April 22.

(From Our Special Correspondent.)

Iron Ore.—The ore movement from the head of the lakes has been restricted somewhat by the inability to get the ore away from the mines as rapidly as might be wished and out of the frozen stock piles. Reports are that vessels sailing under the most favorable circumstances have been delayed at times 3 and 4 days in getting their cargoes. The situation is but little better at the lower lake docks, where, until yesterday, a tug strike prevailed. In addition the movement from the docks to the furnaces has been slow because of the shortage of cars. All told the season has not been very active so far. The rates of carriage remain stable through force of circumstances rather than by any active demand for tonnage or the reverse which would affect them. The rates are: 75c. from Duluth; 65c. from Marquette; and 55c. from Escanaba. The selling prices are nominal at $4.25 for bessemer old range and $3.25 for non-bessemer old range and bessemer Mesabi.

Pig Iron.—The scarcity of material is so great that even carload lots are off the market for the next two months and the selling price has gone up almost feverishly. Some sales of Southern Ohio No. 2 foundry have been made at $22.45 delivered here. Other prices are about on a parity, although there is some talk of contracts having been placed for fourth quarter delivery at $19 in the Valleys. No sales have been made past the first of the year. The basic producers announce that they are off the market for the next year, having sold all of their product for that length of time at the prevailing market prices. Bessemer producers are no better off and the prices are unchanged.

Finished Material.—Plate producers are so short of material that they are asking and are obtaining premiums of $2 a ton and upwards on material for quick shipment. This is not an authorized advance, but the action of some individuals. Some tank plate has been sold at from $4 to $6 advance over market prices. Sheets, between No. 10 and No. 16, have also advanced in price $3 a ton and the market is firm. The increase is presumably caused by the shortage of sheet bars and the need of sheets in the open market when the production is being curtailed. The bar prices also are standing up well and there is talk of further advances, based presumably upon the increasing price of billets. Bar iron is now sold at 1.80c. Pittsburg, bessemer steel bars at 1.60c. Pittsburg and 1.70c. Pittsburg for open-hearth steel bars. Structural steel is still the object of the desire of many while the market is very dull, there being no material of which to make disposition. Some are depending upon the foreign market for their supply and the first importations are soon to be made for this territory. The demand for pipe is heavy with prices unchanged, black pipe bringing 60 and 67 off list and galvanized pipe 48 and 55 off list.

Old Material.—The demand is increasing, especially upon old iron rails and heavy melting steel, and prices have been generally advanced, the following being the new quotations: Car wheels, $19; cast scrap, $15.50; heavy melting steel, $19; iron rails, $27.50; iron axles, $20; cast borings, $10; No. 1 wrought, $19.50.

Philadelphia. April 24.

(From Our Special Correspondent.)

Pig Iron.—Conditions remain about the same in Eastern and Middle Pennsylvania. But little crude iron has been bought. Negotiations are hanging fire with Southern makers. A canvass made of a number of large local consumers shows they have all the iron they need for current demands. Inquiries among furnace agencies show no new features in the situation. Everything is oversold. Special brands were marked up or at least quoted $1 higher this week to prospective buyers. Consumers are exacting prompt deliveries according to contract. Some little speculating has been done and the speculators have offered to transfer their contracts. The consumption of basic iron has reached a high point, but requirements are pretty fairly covered for three or four months. Speculative influences are at work and events are awaited with interest. All foundry irons are threatening a further advance and the pivotal point is what the larger consumers will do with reference to covering future wants during the coming 30 days. Our furnace people talk against taking advantage of the pressure for iron. Forge production seems equal to demand and while capacity is strained, there is no fear as to prices breaking upward. Our people are watching outside markets closely.

Muck Bars.—Price is supposed to be $33.

Bars.—Demand is off but there is no sign of weakness. Buyers feel they have gone far enough in the direction of covering future requirements. Iron bars are 1.90@2c.; steel, 1.80@1.90c. A little quiet will have a good effect. Mill representatives said to-day that the capacity will take care of customers' actual wants. It is hinted that concessions may be made on large orders for bars, but with forge iron at its present figures it does not seem possible to shade on bars.

Sheets.—Manufacturers fight shy of late delivery orders, desiring to keep in shape to take care of their old customers first. Galvanized sheets are leading, but the pressure extends to every product. The card rate is 2.20@3.40c.

Pipes and Tubes.—This branch is under pressure for early deliveries. A lot of new business came up within a few days and has all been taken care of. Tube work is the most urgent and all users are calling for stock as fast as it is possible to turn it out. Merchant pipe orders in small lots are at present attracting much attention.

Skelp.—Grooved and sheared are both wanted, generally big orders.

Hoops and Bands.—Quite a number of orders for small lots came our way last week, and were sent to mill at outside quotations under the recent advance; a few of them at bonus prices.

Plates.—The business done here was all at an advance over card rates, if card rates can be said to have any existence. There is a sincere desire to have quotations return to normal. Bonus prices are all very nice in their way, but they are not sought after. Inquiries have been noted since last week which aggregate fully 15,000 tons. Small lots of fire-box and boiler plate are selling daily. Flange is 2c.; sheared 1.90c.

Structural Material.—New and urgent building requirements burst upon us within a week. They are bothering us not because of the quantity but the urgency of early delivery. Builders do not seem to understand that we are sold up for practically months to come. The local and Eastern Pennsylvania requirements figure up a good deal more than at this season last year. Manufacturers do not particularly care for this sort of business, but it must be accommodated. Angles are 1.85c.

Steel Rails.—Trolley road rails are being sought for and small orders for heavy sections for yard relaying.

Old Rails.—The quotation given is $25.50 for iron, but no sales are reported.

Scrap.—A few energetic dealers have succeeded in making heavy deliveries on both heavy and light scrap. But the scrap supply generally is below what the market can absorb. The scrap most wanted is choice railroad, and the price for this is $25. Heavy melting steel is $21, and none in sight. Cast borings, $10. Old car wheels nominally $18.

Pittsburg. April 23.

(From Our Special Correspondent.)

Prices of pig iron continue to advance and for the first time in many years bessemer, gray forge and foundry No. 2 are quoted at practically the same price in this market. There is scarcity of all grades and it is believed there will be some difficulty in filling orders already placed for delivery during the second half. The strike of the blast furnace employees, if it is begun on May 1 as now contemplated, will further complicate matters and the situation will be serious. So far the furnace owners have not been officially notified of the proposed enforcement of a three-turn system, the leader of the workers declaring at a mass meeting this week that the publication of the action taken at the Youngstown convention was sufficient notification. It has been developed, however, that the organization is not as strong as has been represented and that the strike will have little or no effect on the blast furnaces in the Pittsburg District. In the Mahoning and Shenango valleys the union has a large membership but at some of the furnaces the men have refused to participate in the strike movement. The majority of the furnaces will be forced to suspend operations. It is admitted that it will be impossible to secure new men to take the places of strikers and also to concede their demands for an additional turn for the same reason.

There is a greater scarcity of steel this week than at any time during the past six months with no indication of an immediate improvement. Some orders have been placed for foreign steel and these may be increased. German bessemer steel billets can be delivered in Pittsburg at $32.50, which is the average price quoted for the product of the American mills in this district. The demand for foreign steel has increased to such an extent during the month that it is difficult now to get deliveries before June. The United States Steel Corporation has imported large quantities of steel, but most of it will be exported in finished material on which the tariff drawback will be allowed.

Officers of the big steel combine are in the Pittsburg District inspecting sites for proposed extensions of plants. The new tube works on which about $12,000,000 is to be expended may be located on Neville Island, 3 miles below Pittsburg in the Ohio River. A site at Lorain, O., is also under consideration and it is positively announced that the original plan to locate a great tube plant at Conneaut Harbor, O., has been abandoned. Strong efforts are being made to secure the works in the Pittsburg District. The plants of the American Bridge Company in this district are to be concentrated at Economy, about 20 miles from this city on the Pittsburg, Fort Wayne & Chicago Railroad. While the report is not confirmed it is generally believed that plans have been perfected for a big plant at that place that will cost about $3,000,000. Plans are being considered for dividing the various branches of the business of the steel combine into departments. The blast furnaces are to be separated from the individual corporations and formed into a department. The ore mines, railroads and steamship lines will also be removed from the control of the individual concerns and made into a department. Similar action will also be taken as to the pipe and tube mills, sheet plants and tin plate works.

The annual convention of the Amalgamated Association of Iron, Steel and Tin Workers spent the entire week in organizing. The delay was due to contests of seats of delegates from lodges that had ignored the strike assessments. There were three assessments, one of 10 per cent of each members' earnings for two weeks and two of 5 per cent each. Over one-fourth of the lodges were delinquent. A compromise was finally reached and all delegates were seated. The terms of the settlement were not made public, but it is reported that the lodges agreed to pay some time in the future. Yesterday was taken up in hearing the report of the president giving a history of the steel strike. The ante-convention wage settlements likely will come up for consideration to-morrow.

The demand for bar iron was heavy during the week and in some instances as high as 1.90c. was obtained, but most sales were made at 1.80c.

Pig Iron.—Bessemer pig iron is quoted at $19.50 @20 in the Valleys and several small lots aggregating 1,000 tons were sold. About 1,000 tons of gray forge were sold at $19.50@20.25, Pittsburg. Foundry No. 2 is quoted at $20@21.50, Pittsburg, but sales were limited.

Steel.—Bessemer steel billets are being quoted at $32 and $33, but no sales are noted. The scarcity has become so great that large orders for foreign steel are being placed. Tank plate and steel bars are still quoted at 1.60c.

Sheets.—The sheet market is firm and there is a good demand for fancy sheets for deep stamping. No. 28 gauge of black sheets is quoted at 3.10c. to 3.15c., and galvanized at 4.47c. in car-load lots, and 4.67c. in less than car-load lots.

Ferro-Manganese.—The demand continues fair and 80 per cent domestic remains at $52.50.

New York. April 26.

Pig Iron.—Spot iron is very hard to get and sells in small lots at fancy prices. There is no prospect of immediate relief for buyers. The market, while strong, is not active. We quote for tidewater delivery: No. 1X foundry, $20@$20.50; No. 2X, $19@$19.50; No. 2 plain, $18.50@19; gray forge, $17.75@18.25. For Southern iron on dock, New York, No. 1 foundry, $16.75@$20; No. 2, $15.75@$18.50; No. 3, $15.50@$17; No. 4, $14.75@16.50.

Cast Iron Pipe.—The market is firm and active with quotations advancing. Fore tidewater delivery $30 per ton is now quoted on medium sizes.

Bar Iron and Steel—Demand continues. We quote 1.70c. for common bars in large lots on dock; refined bars, 1.83c.; soft steel bars, 1.83c.

Plates.—In spite of advances on tank demand for that grade, as for others, continues active. We quote for tidweater delivery in car-loads. Tank, ¼-in. and heavier, 1.78@1.98c.; flange, 1.88@2c.; marine, 1.98 @2.10c.; universal, 1.78@1.98c.

Steel Rails.—While quotations are nominally unchanged there are no rails to be bought for those figures. It is doubtful if a small buyer can get deliveries at quoted prices before 1903. Standard sections are still nominally quoted at $28 at Eastern mills; light rails at $30@$3, according to weight. Prompt delivery commands a good premium.

Structural Material.—The premiums asked for prompt delivery are, if anything, heavier than they have been and further importations are likely, particularly of angles. We quote for forward delivery on large lots at tidewater as follows: Beams, 1.90@ 1.95c.; tees, 1.85c.; angles, 1.80c.

METAL MARKET.

New York. Apr. 24.

GOLD AND SILVER.

Gold and Silver Exports and Imports.

At all United States Ports in March and Year.

Metal	March. 1901.	March. 1902.	Year. 1901.	Year. 1902.
Gold.				
Exports....	$490,269	$4,732,181	$9,128,240	$15,323,143
Imports....	2,520,455	2,609,060	8,645,355	5,698,740
Excess.	I. $2,030,186	E. $2,123,121	E. $482,885	E. $9,624,403
Silver.				
Exports....	$5,150,186	$3,329,255	$14,519,674	$11,702,653
Imports....	2,706,366	2,296,203	8,085,093	6,409,479
Excess.	E. $2,443.820	E. $1,033,052	E. $6,434,581	E. $5,353,174

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 April 24, 1902, and for years from January 1, 1902, 1901 and 1900:

Period.	Gold. Exports.	Gold. Imports.	Silver. Exports.	Silver. Imports.	Total Excess Exports or Imports.
Week...	18,367	$17,537	$309,088	$15,628	E. 384,290
1902.....	16,437,751	1,031,880	13,456,412	439,300	E. 25,422,323
1901.....	12,379,779	942,133	11,689,738	1,248,347	E. 21,867,037
1900.....	4,094,085	1,270,124	12,260,173	1,404,383	E. 13,667,751

Gold exports and imports for the week were in small lots, to different ports. Silver exports were chiefly to London; imports were from the West Indies and South America.

Financial Notes of the Week.

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

	1900.	1901.	1902.
Loans and discounts	$767,473,300	$882,067,300	$894,491,400
Deposits	842,629,400	967,201,200	952,774,200
Circulation	21,390,100	31,454,100	30,976,300
Specie	161,839,600	185,684,200	172,332,400
Legal tenders	63,712,100	71,038,200	72,139,800
Total reserve	$225,551,700	$256,722,400	$244,772,200
Legal requirements	210,657,350	241,800,300	238,193,550
Balance surplus	$14,894,350	$14,922,100	$6,578,650

Changes for the week, this year, were increases of $56,900 in circulation, $336,600 in specie, $523,500 in legal tenders, and $2,006,900 in surplus reserve; decreases of $5,890,400 in loans and discounts, and $4,587,200 in deposits.

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

	1901. Gold.	1901. Silver.	1902. Gold.	1902. Silver.
N. Y. Ass'd..	$185,684,200	.....	$172,332,400	.....
England	175,733,835	.....	178,469,810	.....
France	485,683,975	$219,495,660	513,297,255	$221,194,540
Germany	148,850,000	69,395,000	186,670,000	69,050,000
Spain	70,010,000	82,870,000	70,430,000	91,125,000
Netherlands..	25,285,000	28,455,500	23,910,500	32,541,500
Belgium	14,610,000	7,305,000	15,573,335	7,786,665
Italy	76,235,000	9,650,000	80,640,000	10,631,500
Russia	364,840,000	33,970,000	362,170,000	41,435,000

The returns of the Associated Banks of New York are of date April 19 and the others April 17, 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 only gold.

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

	1901.	1902.	Changes.
India	£2,560,710	£2,156,585	D. £404,125
China	246,125	16,500	D. 229,625
The Straits	48,976	250	D. 48,726
Totals	£2,855,811	£2,173,335	D. £682,476

Arrivals for the week, this year, were £187,000 in bar silver from New York, and £10,000 from Australia; total, £197,000. Shipments were £160,000 in bar silver to Bombay, and £22,500 to Calcutta: total, £182,500.

The silver market continued its downward tendency last week, until on April 21 it suffered a very sharp drop to 23 5-16d. The lowest price previous to this was 24¾d., on September 1, 1897, when Japan adopted the gold standard. The recent fall has been caused by absence of demand, India buying only moderately, and China, instead of being a buyer, selling silver on account of the indemnity fund. The market has reacted sharply to 23⅞d., but closes dull at this figure, with a drooping tendency.

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

Indian exchange has been dull, and the demand for Council bills in London has been light. Those taken were placed at an average rate of 15.91d. per rupee. There were moderate sales of silver for Indian account in London, but no special demand.

Exports of gold from Australia up to the end of February were £1,936,930, against £1,874,419 to the same date in 1901. Of the total this year, £42,421 went to Hong Kong, and £1,085,765 to India.

The foreign merchandise trade of Great Britain for the 3 months ending March 31 is valued by the Board of Trade returns as below:

	1901.	1902.
Imports	£132,121,432	£132,694,250
Exports	87,030,399	83,257,706
Excess, imports	£45,091,033	£49,436,544

This shows an increase of £572,818, or 0.4 per cent, in imports; a decrease of £3,772,693, or 4.2 per cent, and a resulting increase of £4,345,511, or 9.6 per cent, in the excess of imports. The movement of gold and silver for the 3 months was as follows:

Gold:	1901.	1902.	Changes.
Imports	£5,825,851	£4,119,270	D. £1,706,581
Exports	2,945,806	2,825,792	D. 120,014
Excess	I. £2,880,045	I. £1,293,478	D. £1,586,567
Silver:			
Imports	3,307,201	2,270,369	D. 1,036,832
Exports	4,586,774	2,554,472	D. 2,032,302
Excess	E. £1,279,573	E. £284,103	D. 995,470

Of the silver imported this year, £1,889,165, or 84.1 per cent of the total, was credited to the United States.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars	$0.41	$0.44
Peruvian soles and Chilean pesos	.37	.41½
Victoria sovereigns	4.86	4.88
Twenty francs	3.86	3.88
Twenty marks	4.74	4.85
Spanish 25 pesetas	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

Apr.	Sterling Exchange	Silver—N. Y. Cts.	Silver—London Pence.	Copper—Lake Cts. per lb.	Copper—Electrolytic per lb.	Copper—London £ per ton.	Tin, cts. per lb.	Lead cts. per lb.	Spelter—N.Y. cts. per lb.	Spelter—St. L. cts. per lb.
18	4.87½	52⅝	24¼	12 @12¼	11⅝ @11¾	53 1/16	28¾	4.05 @4.10	4.37½	4.17½
19	4.87½	52¼	24 1/16	12	11⅝	28½		4.05 @4.10	4.37½	4.17½
21	4.87½	50½	24 5/16	11⅞ @12	11½ @11⅝	53	28	4.05 @4.10	4.35	4.15
22	4.87⅝	5	....	11⅞ @12	11½ @11⅝	52⅝	27½	4.05 @4.10	4.35	4.15
23	4.87¾	51⅝	23⅞	11⅞ @12	11½ @11⅝	52¼	27⅛	4.05 @4.10	4.35	4.15
24	4.87⅞	51¾	23⅞	11⅞ @12	11⅛ @11⅝	52⅛	28⅛	4.05 @4.10	4.35	4.15

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

Copper.—The market is quiet. Various transactions are reported, but none of large volume. Manufacturers appear to be buying the balance of their requirements for the next few months, but are not yet purchasing heavily beyond that. The European demand is not quite as good as earlier in the month. Somewhat lower prices have been current, and we quote Lake copper at 11⅞@12c.; electrolytic in cakes, wirebars and ingots, at 11½@11⅝c.; in cathodes at 11¼@11⅜c.; casting copper at 11⅜@11½c.

The foreign market has declined £1 during the week under review. It closed last Thursday at £52 17s. 6d., and on Friday it was up to £53 1s. 3d., at which price it ruled on Monday. On Tuesday it dropped to £52 12s. 6d., on Wednesday to £52 7s. 6d., and on Thursday it closed at £52 2s. 6d. for spot and the same for three months.

Refined and manufactured sorts we quote: English tough, £55 10s.@£56; best selected, £56 10s.; strong sheets, £66 10s.@£67 10s.; India sheets, £65 10s.@£66 10s.; yellow metal, 6@6⅛d.

Exports of copper from New York and Baltimore in the week ending April 23 are reported by our special correspondents as follows: To Great Britain, 563 tons: Germany, 674; Holland, 385; France, 1,558; Russia, 285; Austria, 135; other countries, 116; total, 3,716 tons. Imports were 409 tons copper from Mexico.

Imports of copper into Great Britain for the 3 months ending March 31 are reported as below, in long tons; the totals showing the equivalents in fine copper:

	1901.	1902.	Changes.
Copper ore	19,223	26,988	I. 7,765
Matte or precipitate	16,631	22,420	I. 5,789
Fine copper	15,649	30,804	I. 15,145
Total, fine copper	25,887	44,713	I. 18,826

Of the totals this year, 200 tons of ore, 6,776 tons of matte and 19,370 tons of fine copper are credited to the United States; against 183 tons, 2,751 tons and 5,074 tons, respectively, in the first quarter of 1901.

Tin.—After the great activity of last week, a reaction set in, and the London market declined violently in consequence of heavy selling by speculative holders both in Europe and in this country. As a result business here came almost to a standstill, but at the close there is again considerable activity, owing to the recovery in London. At the close we quote spot and April at 28⅛c.; May, 27¾@28c.; June, 27½@27⅝c.

The foreign market, which closed last Thursday at £129 15s. for spot, £126 15s. for three months, was £1 higher on Friday, but on Monday the improvements were lost. On Tuesday a decline to £126 for spot, £122 15s. for three months, took place, followed on Wednesday by a further drop of 5s. On Thursday the market reacted, and the closing quotations are cabled as £126 2s. 6d. for spot, £123 for three months.

Imports of tin into Great Britain for the 3 months ending March 31 are reported as below, in long tons:

	1901.	1902.	Changes.
Straits	6,827	5,761	D. 1,066
Australia	759	812	I. 53
Other countries	1,233	935	D. 298
Total	8,819	7,508	D. 1,311
Re-exports	5,401	5,190	D. 211
Balance	3,418	2,318	D. 1,100

The other countries include Bolivia and the Dutch East Indies.

Exports of tin from the Straits Settlements for the 2 months ending February 28 are reported as follows, in long tons:

	1901.	1902.	Changes.
To United States	3,151	3,830	I. 679
To Great Britain	3,602	3,495	D. 107
To European Continent	966	1,073	I. 107
To China and India	762	318	D. 444
Totals	8,481	8,716	I. 235

The increase shown this year was chiefly in exports direct to the United States. The exports to China this year were very light.

Lead is dull and unchanged. We quote 3.97½@4.05c. St. Louis, 4.05@4.10c. New York.

In London Spanish lead is quoted at £11 12s. 6d.@£11 13s. 9d., English lead £11 15s.@£11 16s. 3d.

Imports of lead into Great Britain for the 3 months ending March 31 are reported as below in long tons:

	1901.	1902.	Changes.
United States	14,157	14,423	I. 266
Spain	19,115	24,400	I. 5,285
Australia	17,301	16,762	D. 539
Other countries	3,022	3,213	I. 191
Total imports	53,595	58,798	I. 5,203
Exports	7,838	7,964	I. 126
Balance	45,757	50,834	I. 5,077

The lead credited to the United States is chiefly Mexican lead refined here in bond.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull and without change. Missouri brands are selling lightly at 3.97½@4c., with argentiferous lead quoted at 4.05c.

Spelter.—The market is quiet and dull. The few orders which present themselves are eagerly competed for, and prices have declined somewhat. We quote St. Louis 4.15c., New York 4.35c.

The foreign market is somewhat higher, good ordinaries being quoted at £18, specials at £18 2s. 6d.

Imports of spelter into Great Britain for the 3 months ending March 31 were 18,725 long tons, against 14,933 tons in the corresponding period in 1901; an increase of 3,792 tons, or 25.3 per cent, this year.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is firm, but quiet. The nominal value is 4.15c.

Antimony is unchanged. We quote Cookson's at 9¾@10c.; Hallett's, 8@8½c.; Hungarian, Japanese, Italian and U. S. Star, 7¾c.

Nickel.—The price continues firm at 50@60c. per lb., according to size and terms of order.

Platinum.—Consumption continues good. Ingot platinum in large lots brings $19.50 per oz. in New York.

Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 82c. per gram.

Quicksilver.—The New York price continues $48 per flask for large lots, with a slightly higher figure for small orders. In San Francisco quotations are firm at $47.50@$48 for domestic orders, and $44 for export. The London price is £8 15s. per flask, with the same figure quoted from second hands.

Imports of quicksilver into Great Britain for the 3 months ending March 31 were 847,646 lbs., against 1,092,540 lbs. for the corresponding period in 1901. Exports were 525,785 lbs., against 513,856 lbs. last year.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

Aluminum.	Per lb.	Aluminum.	Per lb.
No. 1, 99% ingots	33@37c.	Ferro-Tungsten (37%)	28c.
No. 2, 90% ingots	31@34c.	Magnesium	$2.75
Rolled sheets	4c. up	Manganese (over 90%)	1.00
Alum-bronze	20@23c.	Mangan'e Cop. (20% Mn)	32c.
Nickel-alum	33@39c.	Mangan'e Cop. (30% Mn)	38c.
Bismuth	$1.50	Molybdenum (Best)	$1.82
Chromium (over 90%)	1.00	Phosphorus	50c.
Copper, red oxide	50c.	American	70c.
Ferro-Molyb'um (50%)	$1.25	Sodium metal	50c.
Ferro-Titanium (10%)	90c.	Tungsten (Best)	62c.
Ferro-Titanium (20%)	$1.10		

Variations in price depend chiefly on the size of the order.

Average Prices of Metals per lb., New York.

	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	....	25.93	....	4.350	....	3.98
May	....	27.12	....	4.350	....	4.04
June	....	28.60	....	4.350	....	3.99
July	....	27.85	....	4.350	....	3.95
August	....	26.78	....	4.350	....	3.99
September	....	25.31	....	4.350	....	4.06
October	....	26.62	....	4.350	....	4.22
November	....	26.67	....	4.350	....	4.29
December	....	24.36	....	4.153	....	4.31
Year	....	26.54	....	4.334	....	4.08

Average Prices of Copper.

Month.	New York—Electrolytic. 1902.	New York—Electrolytic. 1901.	New York—Lake. 1902.	New York—Lake. 1901.	London—Standard. 1902.	London—Standard. 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	....	16.43	....	16.94	....	69.61
May	....	16.41	....	16.94	....	69.66
June	....	16.38	....	16.90	....	68.83
July	....	16.31	....	16.61	....	67.66
August	....	16.25	....	16.50	....	66.34
September	....	16.25	....	16.54	....	65.97
October	....	16.25	....	16.60	....	64.11
November	....	16.224	....	16.33	....	64.51
December	....	13.845	....	14.36	....	52.34
Year	....	16.117	....	16.53	....	66.79

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper. The prices for electrolytic copper are for cakes, ingots or wire bars; prices of cathodes are usually 0.25 cent lower

Average Prices of Silver, per ounce Troy.

Month.	1902. 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	....	....	27.30	59.29	27.41	59.59
May	....	....	27.43	59.64	27.56	59.90
June	....	....	27.42	59.57	27.81	60.42
July	....	....	26.96	58.46	28.23	61.25
August	....	....	26.94	58.37	28.13	61.14
September	....	....	26.95	58.26	28.85	62.63
October	....	....	26.62	57.59	29.58	63.83
November	....	....	26.12	56.64	29.66	64.04
December	....	....	25.46	55.10	29.68	64.14
Year	....	....	27.11	58.95	28.27	62.33

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

LATE NEWS.

MONTANA.

PARK COUNTY.

Cowles Mining Company.—The incorporation papers of this company will shortly be filed. The property consists of a number of placer claims and several quartz claims situated up the Boulder about 55 miles from Big Timber. The property has been under development for 5 years. The quartz is free milling. A 10-stamp mill on the Hidden Treasure claim has been running to demonstrate the ore bodies. It is the intention to add 50 additional stamps this season. The company will be capitalized at $5,000,000. The stock will be held by M. B. Stevens & Sons, of Andover, Mass., and E. H. Cowles, of Cowles, Mont., who is the general manager in charge. Electric power taken from a plant on the Boulder River will be used for the new mill.

CANADA.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

Rossland Ore Production.—The output of ore for the week ending April 12 and for the year to date is as follows:

Mine.	Week.	Year.
Le Roi	7,258	69,291
Le Roi No. 2	1,700	15,700
Cascade	...	300
Bonanza	...	90
Velvet	...	250
Centre Star	...	2,566
Rossland Great Western	200	1,350
War Eagle	30	90

The usual development work has been carried on in all the Rossland mines on Red Mountain. The last pay roll of the Le Roi came to over $55,000. Some work on the Big Four Mine has been performed, largely confined to a general overhauling.

STOCK QUOTATIONS.

NEW YORK.

Company and Location.	par val	April 17. H.	April 17. L.	April 18. H.	April 18. L.	April 19. H.	April 19. L.	April 21. H.	April 21. L.	Apr. 22. H.	Apr. 22. L.	Apr. 23. H.	Apr. 23. L.	Sales
Alamo, Colo.	$1			.05										1,000
Amalgamated c., Mont	100	66.25	63.75	64.88	63.75	66.00	64.25	65.75	64.50	67.88	64.75	67.00	65.50	213439
*Anaconda c., Mont.	25	110¼	110.	112.	110¼	112.		112.		113.	111⅜	113½		16,803
Anaconda Gold, Colo.	5	.20			.20									2,000
Argentum-Jun., Colo.	2													
Belcher, Nev.	3													
Best & Belcher, Nev.	3			.25										200
Brunswick, Cal.	1	.18		.19				.21		.19	.18			2,100
Catalpa, Colo.	10													
Chrysolite, Colo.	50													
Comstock T., Nev.	100	.06						.06		.05¼				3,500
Comstock Bonds, Nev.	100													
Con. Cal. & Va., Nev.	2½			1.30										300
Crescent, Colo.	10							.14						200
Cripple Cr. Con., Colo.	1									.07½				500
Doctor Jack Pot, Colo	1									.35				200
Elkton, Colo.	1			.77				.80				.82	.80	900
Golden Fleece, Colo.	1					.37		.37				.33		800
Greene Con., Mex.	10	22.00	21.88	22.50	21.75			22.50	22.00			22.50	22.25	5,800
Hale & Norcross, Nev.	3					.23								300
Horn Silver, Utah	25									1.50		1.40		503
Isabella, Colo.	1	.26		.26		.23		.25		.26		.26		3,800
Jack Pot, Colo.	1	.29		.27										7,00
Mexican, Nev.	3	.50		.50										400
Mine Securities, U. S	100	7.88	7.13	8.00	7.75	7.88	7.75	8.00	7.75	8.00	7.75	7.88	7.63	5,000
Mollie Gibson, Colo.	5							.11						300
Ontario, Utah	100			9.50	9.13									50
Ophir, Nev.	3	1.55				1.20								300
Pharmacist, Colo	1							.05						1,000
Phoenix, Ariz.	1													
Portland, Colo.	1											1.95		100
Potosi, Nev	3													
Quicksilver, Cal.	100			3.50										100
Quicksilver pf., Cal.	100													
Small Hopes, Colo.	20	.45				.45				.45				900
Standard Con., Cal.	10					3.50				3.55	3.50	3.65		400
Tenn. C., Tenn.	25	11.25	10.50	11.00		11.25	10.75	10.75	10.50	10.13		10.25		837
Union Copper, N. C.	10	3.50		3.75		3.50		3.75		3.75	3.50			645
White Knob, Ida.	100	23.50	23.00	23.63	23.00	23.50	23.00	22.75	22.50	22.25		24.38	21.63	5,505
Work, Colo.	1					.08		.08				.07½		2,000

*Per cent.

Coal and Industrial Stocks.

Am. Agr. Chem., U.S.	100	22	22	24¼	23	25	23	24½	22½	24	22½	25	22½	100
Am. Agr. Chem. pf, U.S.	100	83	82½	83		83⅛	82½	83⅜	82½	83⅛	82½	83½	82½	100
Am. Car & Fdy., U.S.	100	28¾	28⅝	29½	28½	29½	29¼	29½	29	29⅜	29¼	29¼	29	5,187
Am. Car & Fdy. pf, U.S.	100			89½	88⅝	89⅝		89½	88⅛	89½		89⅜	89¼	2,920
Am. Sm. & Ref., U.S.	100	46⅞	46¼	47	46⅜	47¼	46⅞	47	45½	45⅞	43½	44½	43½	26,450
Am. Sm. & Ref. pf, U.S.	100	97		97		97⅝		97	95⅛	95⅞	95¼	95⅛	95¼	8,305
Col. Fuel & I., Colo.	100	107⅜	103¾	106½	107	109	108	109	105	108	105½	106⅞	105¼	31120
Col. & H. C. & I., Colo.	100	21¼	21	21¾	21	21½	21	21	20⅜	20¼	20	21¼	20⅝	4,100
Int'l S. Pump, U.S.	100	55½		54½		54½				54½	54¼	54¼	54	498
Int'l S. Pump pf, U.S.	100			92½				93	91	93	90	93	90	200
Mong. R. Coal, Pa.	100							13⅜	13	13⅜	13	13¼	13⅜	1,346
Mong. R. Coal pf, Pa.	100	43½		43⅜		43⅜	43⅜			43½		43¼		610
National Lead, U.S.	100	18⅜	18⅜	19⅜	19	19½	19¼	19½	19¼	19	18¼	18½		3,530
National Lead pf, U.S.	100	85						89	86¾	87	86⅜			345
National Salt, U.S.	100	15						20		20		20		100
National Salt pf, U.S.	100	69¾						69¾		69¼		69¾		
Pittsburg Coal, Pa.	100	25	24¾	24⅞		25½		25⅝	25½	25⅛		25½		3,938
Pittsburg Coal pf, Pa.	100	89½	89	90	89⅞	90¼	90	90½	90⅜			90⅛	90	3,216
*Pressed Steel Car, Pa.	100	40¾		41¼	40½	40¼		41⅝	40½	41⅛		41¼		2,550
Republic I. & S., U.S.	100	17⅜	17⅛	18	17⅛	18¼	18	18⅜	17½	18⅜	17¼	18⅜	18¼	32,900
Republic I. & S., pf, U.S.	100	74	73½	74	73½	74⅛	73½	74	73½	74½	74	74¼	74	21,500
Sloss-Shef S. & I., Ala.	100	33	32	33	32	33	32	32				33		400
Sloss-Shef S. & I. pf, Ala.	100	82		83	82	83	82¾			82¾		82½		500
Standard Oil, U.S.	100	625	620	624	620	625	620	624	620	626	618			210
Tenn. C. I. & R. R., Ala.	100	71	70	71⅝	70¼	72¼	71¾	73	71	71¾	70⅝	73⅜	70¼	127395
U. S. Red. & Ref., Colo.	100	40½	39⅞	43⅛	40	44	41½	43⅜	42½	43	42¾	42⅜		6,600
U.S. Red. & Ref. pf, Colo	100			64¼		65½	64	65½		65¾	65¼	65¼		3,700
U.S. Steel Corp., U.S.	100	42	41	42⅜	42⅛	42¾	42½	43	42	42¾	42	42⅜	41⅞	125244
U.S. Steel Corp. pf, U.S.	100	94¼	93½	94¼		93¼	92⅞	93⅛	92½	92⅞	92⅜	92⅜	92⅛	62,153
Va.-Car Chem., U.S.	100	71	70⅜	71¼	70¾	71⅛	70⅜	71¼	71	72⅜	70⅜	73¾	72½	32,615
Va.-Car Chem. pf, U.S.	100	130⅜		130½		130¼				130⅞	130⅜	130¾		1,575

Total sales, 1,049,253 shares. * Ex-dividend.

PHILADELPHIA, PA. §

Name and Location of Company.	par val	Apr. 17. H.	Apr. 17. L.	Apr. 18. H.	Apr. 18. L.	Apr. 19. H.	Apr. 19. L.	Apr. 21. H.	Apr. 21. L.	Apr. 22. H.	Apr. 22. L.	Apr. 23. H.	Apr. 23. L.	Sales
Am. Alkali	$50	.38												50
Am. Cement	10					7.60		6.88		6.88		6.88		505
Beth. Iron, Pa.	50													
Beth. Steel, Pa.	50													
Cambria Iron, Pa.	50			47.50				47.50	47.00	48.00		47.50		318
Cambria Steel, Pa.	50	24.13	23.75	24.00	23.88	24.38	23.75	24.63	24.50	24.88	24.88	24.63	24.25	9,769
Susq. I. & S., Pa.	10	2.13		2.13				2.18				2.18		900
United Gas I., Pa.	50	122	121½	123	122	122		122¼	122	122½	122	122	121⅝	4,475

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 16,017 shares.

MEXICO.

Apr. 12.

Name of Company	Shares.	Last div'd	Prices. Bid.	Prices. Ask.
Durango:				
Ca. Min. de Penoles	2,500	$50.00	$4,150	$4,250
Augustias, Pozos	2,400	5.00	60	70
Guananjuato:				
Cinco Senores y An., aviada	2,000	15.00	240	245
Cinco Senores y An., aviada	400	10.00	215	225
Providencia, San Juan de la Luz	6,000	2.00	240	250
Guerrero:				
Garduno y Anexas.	7,200		30	50
Hidalgo:				
Amistad y Concordia.	9,600	4.71	53½	55½
Carmen, aviada	1,100		250	300
Ca. Real del Monte	2,554		450	550
El Encino, aviador	1,120		40	50
Guadalupe Fresnillo y Annexas.	1,000		220	300
La Blanca, aviada.	1,536		495	500
La Blanco, aviada.	768		260	280
Maravillas y An., aviador	1,680		300	320
Maravillas el Lobo	1,000		200	250
Palma y An., aviador	1,800		15	25
Sta. Gertrudis y An., aviador	9,600		10	11
Sta. Gertrudis y An., aviador	28,800	0.50	65	65½
Santo Tomas Apostol aviador	5,130		6	7
San Rafael y An., aviada	1,200	12.00	670	680
San Rafael y An., aviada	1,200	8.00	300	310
Solodad, aviada	900	5.00	270	280
Sorpressa, aviada	900	5.00	190	205
Mexico:				
Alacran	2,400		$50	$65
La Esperanza (El Oro)	3,000	$10.00	795	805
Socovon de S. Fern.	2,500		20	30
Michoacan:				
Luz de Borda, aviador	3,000		24	26
Luz de Borda, aviada	1,000		10	12
San Luis Potosi:				
Concepcion y An.	3,000		110	115
El Barreno, aviador.	2,000	2.00	20	22
Sta. Maria de la Pa.	2,400	10.00	575	590
Santa Fe.	2,400		20	30
San Diego y Annexas.	2,400	4.00	65	67
Zacatecas:				
Candelaria y Pinos	2,500		320	340
San Carlos y Annexas	2,500	10.00	320	330
Sta. Maria de Gaud.	2,500	10.00	346	352
Miscellaneous:				
Bartolome de Medina	2,000	1.50	50	55
Guadalupe Hacienda	10,000	3.00	220	230
La Luz Hac. (Pachuca)	3,750		75	80
La Reina (Chihuahua)	192		2,500	3,500
Naica (Chihuahua)	100		4,500	5,000
Natividad (Oaxaca) aviador	1,800	4.00	480	520
National (Oaxaca) aviador	1,800	4.00	400	500
San Francisco Hac.	6,000	2.00	195	200
Santa Ana Huantla Morelos.	4,000		50	70
Union Hacienda	3,000	5.00	185	195

BOSTON, MASS.

Name of Company.	par val	Shares listed.	Apr. 17. H.	Apr. 17. L.	Apr. 18. H.	Apr. 18. L.	Apr. 19. H.	Apr. 19. L.	Apr. 21. H.	Apr. 21. L.	Apr. 22. H.	Apr. 22. L.	Apr. 23. H.	Apr. 23. L.	Sales.
Adventure Con., c	$25	100,000	22.50		22.50	22.00			23.25	22.75	23.00	22.50	22.75		1,425
Aetna Cons.	5	100,000													
Allouez, c	25	80,000			3.50						3.75				172
Amalgamated, c	100	1,500,000	66.00	63.75	65.00	63.75			65.63	64.63	66.38	65.60	67.00	65.63	16,342
Am. Gold Dreg.	5	80,000													
Am. Z. L. & Sm.	25	60,000			12.75				12.50	12.00	12.50		12.50	12.00	615
Anaconda, c	25	1,200,000	27.38		27.50										70
Arcadian, c	25	150,000			8.13	8.00			8.13	8.00	8.00				715
Arnold, c	25	60,000	.77½	.65											200
Atlantic, c	25	40,000							33.00	30.00	33.50	32.00	32.00		2,437
Baltic	25	100,000													
Bingham, Cons.	50	150,000	35.25	33.50	39.25	35.00			39.75	36.00	38.50	36.00	38.00	36.75	16,216
Bonanza Dev.	10	300,000			.85								.85		500
Boston, q.	10	100,000											5.00	3.00	350
British Columbia	5	250,000													
Cal. & Hecla, c	25	100,000	585.	582.	580.	575.			585.	564.	565.	5.00	566.	565.	143
Centennial, c	25	90,000	20.00	19.13	20.00	19.13			20.00	19.50	20.75	20.25	20.00	19.75	2,315
Central Oil	25	60,050	7 00												250
Cochiti, g.	10	182,250	.40										.30		625
Cons. Mercur, g	5	1,000,000	2.00	1.88	1.81	1.75			1.88	1.78	1.93	1.75	1.88	1.75	10,225
Con. Zinc & L. M. S.	10	110,000													
Copper Range, Con.	100	285,000	59.88	59.00	60.00	59.00			61.75	60.00	61.63	59.75	60.50	60.00	2,874
Daly-West.	20	150,000	48.00	47.75	46.50	46.00			46.50	44.75	46 00	45.00	44.00	43.75	2,112
Dominion Coal.	100	150,000	140	138.	144.	142½			141⅛	140.	139.	137¾	1.40	1.37	1,191
Dominion Coal, pf.	100	30,000													
Dominion I & S.	100	100,000	69.50	66.50	72.50	69.50			71.00	68.50	68.25	68.00	68.50	67.13	10,466
Elm River, c	12	100,000													
Franklin, c	25	100,000	12.00		12.13						12.00		11.50		560
Guanajuato Cons.	5	385,000			4.00	3.63			3.63	3.50	4.00	3.50	3.75		20,070
Humboldt, c	25	40,000													
I. Royale Con., c	25	150,000	14.50	13.00					14.00	13.00	12.50	12.00	13.00	12.00	
Mass. Con., c	25	100,000	19.00						19.00		19.38	18.75	19.00	18.75	995
Mayflower, c	25	100,000							3.00	2.88			3.00	2.88	605
Merced	15	160,000													
Michigan, c	25	100,000	11.25								11.00		11.50	11.00	292
Mohawk, c	25	100,000	36.50		36.00	35.00			35.88	35.00	37.00	35.00	36.50	35.88	1,817
Mont. C. & C.	25	200,000													
Mont'l & Boston	5	570,000	3.00	2.75	3.00	2.88			2.88	2.63	3.06	2.75	3.25	3.13	5,115
National.	25	100,000			1.50										100
N. E. Gas & Coke.	25	100,000	4.00	3.00	4.25	3.50			4.00		4.00		4.00		1,745
New Idria	5	100,000													
Old Colony, c	25	100,000									4.00	3.50	4.00		880
Old Dominion, c	25	150,000	22.00	21.25	21.50	21.00			21.50	20.75	20.00		20.00	19.00	2,460
Osceola, c	25	96,150	62.50	62.00	62.25	62.00			63.00	62.00	65.00	62.50	64.00	63.00	1,450
Parrot, s. c	10	229,850	28.00	27.00	28.00	27.00			27.60		26 75		27.00	26.50	757
Phoenix Con., c	25	100,000	3.75	3.50					3.50		3.75	3.50	4.00	3.75	985
Quincy, c	25	100,000	125.		1.25						1.25				160
Rhode Island, c.	25	100,000			2.50				2.50				2.50	2.38	130
Santa Fe, g. c	10	250,000	3.00		3.00				3.25	3.00	3.00		3.00		1,385
Santa Ysabel	5	130,000													
Tamarack, c	25	60,000	177.	175.	177.				180.	177.	179.		175.		159
Tecumseh, c	25	80,000											1.50		75
Tennessee	25	175,000													
Trimountain, c	25	100,000													
Trinity, c	25	100,000	13.50	13.00	13.50	13.00			13.50	13.25	14.00	13.50	13.50	13 13	4,661
United States, g.	25	250,000	21.50	21.00	22.00	21.00			22.50	21.75	22.75	21.75	22 00	21 63	23,834
U. S. Oil	25	100,000	15.25	15.00	15.25	15.00			15.25	14.75			15.00	14.88	31,027
Utah Con., g.	5	300,000	23.00	22.25	23.25	22.50			23.25	22.50	23.00				2,852
Victoria, g.	25	100,000	5.00		5.50	5.25			5.25	5.00	5.38	5.00	5.00		1,310
Washington, c.	25	60,000													
Winona, c.	25	100,000	1.50		1.75	1.50			1.50		1.50		2.38	1.50	5,021
Wolverine, c.	25	60,000	54.50	54.00	54.50	54.00			54.50				54.50	53.00	267
Wyandot, c.	25	100 000							1.00						50

Official Quotations Boston Stock Exchange. Total sales, 162,085 shares.

ST. LOUIS, MO.*

Apr. 21.

Name.	Shares.	Par	Bid.	Ask.	Name.	Shares.	Par	Bid.	Ask.
Am.-Nettie, Colo.	300,000	$10	$1.00	$1.05	Doe Run Lead Co.	10,000	$100	$128.00	$135.00
Catherine Lead, Mo.	50,000	10	3.00	4.00	Granite Bimet, Mt.	1,000,000	10	2.60	2.67
Central Lead, Mo.	10,000	100	130.00	135.00	K. & Tex. Coal, Mo.	25,000	100	50.00	52.00
Columbia Lead, Mo.	50,000	10	11.00	12.00	St. Joe Lead, Mo.	300,000	10	16.50	17.50
Con. Coal, Ill.	50,000	100	19.50	20.00					

*From our Special Correspondent.

SPOKANE, WASH.*

Apr. 11.

Name of Company.	Par Val.	H.	L.	Sales.	Name of Company.	Par Val.	H.	L.	Sales.
American Boy	$1	.06¼	.05½	6,500	Princess Maud	$1	.03½	.03	23,000
Black Tail	1	.14	.12⅝	4,000	Quilp	1	40	.31½	
Ben Hur	1	.16	.13		Rambler Cariboo	1	.91	.87	3,000
Fisher Maiden	1	.07½	.05		Republic	1	.10¾	.10	15,500
Gold Ledge	0.05	.02⅜	.01¾	63,500	San Poil	1	.30	.27½	1,000
Lone Pine-Surp. Con.	1	.07¾	.07½	20,500	Sullivan	1	.10	.08½	
Morning Glory	1	.03½	.03	7,500	Tom Thumb	1	.23½	.22¼	3,000
Mountain Lion	0.10	.30	.27½	5,000	Trade Dollar	1	.14	.11	

Total sales 149,500 shares. *Reported by Hunner & Harris.

SALT LAKE CITY.*

April 19.

Name of Company.	Location.	Shares.	Par Val.	Quotations. High.	Quotations. Low.	Sales.
Ajax	Tintic	300,000	$10	$0.53	$0.50¾	25,100
Anchor	Park City	150,000	10	3.30	3.25	400
Bullion Beck	Tintic	100,000	10			
Carisa	Tintic	500,000	1	.39	.33	83,960
Con. Mercur	Mercur	1,000,000	5	1.90	1.82½	6,350
Creole	Park City	150,000	1			
Daly	Park City	150,000	20	2.00	1.95½	300
Daly-West	Park City	150,000	20	48.50	44.00	3,363
Dexter	Tuscarora	200,000	5			
Eagle & B. Bell	Tintic	250,000	1	.91	.88	900
Grand Central	Tintic	250,000	1			
Horn Silver	Frisco	400,000	25			
L. Mammoth	Tintic	150,000	1	1.75	1.69	9,325
Mammoth	Tintic	400,000	25	1.37	1.22	4,500
May Day	Tintic	400,000	.25	.37½	.34	40,000
Ontario	Park City	150,000	100	9 00	9.00	356
Sacramento	Mercur	1,000,000	5	.21	.18½	6,100
Silver King	Park City	150,000	20			
Star Con.	Tintic	500,000	1	.17⅞	.16⅜	10,900
Swansea	Tintic	100,000	5			
So. Swansea	Tintic	300,000	1	.75½	.61	90,450
Showers Con.	Tintic	400,000	5			
Sunshine	Mercur	250,000	10	.28¼	.27	3,200
Tetro	Tintic	500,000	5	.29	.23	5,700
Tesora	Tintic	400,000	1			
U. Sunbeam	Tintic	150,000	1			
Uncle Sam	Tintic	500,000	1	.31	.30	11,400
West Mng. Glory	Tintic	500,000	.10	.03	.02¼	36,500
Victor	Tintic	500,000	1	.32	.23½	4,700
Yankee Con.	Tintic	500,000	1	2.59	2.25	4,300
Ben Butler	Bingham	500,000	1	.14¼	.13	19,300
Boss Tweed	Tintic	250,000	1	.60	.55	800
California	Park City	300,000	1	.23½	.19	153,300
Century	Park Valley	150,000	1	.70	.50	16,700

*By our Special Correspondent. Total number of shares sold, 542,225.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.

Name of Company.	par val	Apr. 14. H.	L.	Apr. 15. H.	L.	Apr. 16. H.	L.	Apr. 17. H.	L.	Apr. 18. H.	L.	Apr. 19. H.	L.	Sales
Acacia	$1	.10	.08	.09¼	.08	.10	.08	.10	.08	.10	.08⅝	.10	.08⅞	......
Alamo	1	......	......	.03¼	.03½	.03⅞	.03¾	.03¾	......	.03⅞	.03¼	.03½	.03	1,000
Am. Con	1	.02¼	.02	.02¼	.02	.02¼	......	.02¼	.02	.02¼	.02	.02¼	......	4,000
Anaconda	1	.20	......	.18	......	.18	......	.20	.14	.18	.16	.18	.16	1,000
Aola	1	.01	......	.01½	.01	.01¼	.01	.01⅜	.01	.01¼	.01	.01¼	.01	5,000
Argentum Jr	1	.03½	......	.03½	......	.04	.03½	.04	......	.05	.02	.04	.03	1,000
Battle Mt. C	1	.18½	.17	.17½	.16½	.17¼	.16½	.17	.15	.16¾	......	.17	.16	7,000
Ben Hur	1	.04	......	.04¼	.04⅛	.04⅛	......	.04	......	.04¾	.04	.05	.04	11,000
Black Bell	1	.07½	......	.06	......	.07½	......	.08½	......	.08	......	.08½	......	......
Blue Bell	1	......	......	......	......	......	......	......	......	.07	......	.07	......	1,000
Buckhorn	1	.02½	.02	.02½	.02	.02¼	.02	.02½	.02	.02¼	.02	.02¼	.02	4,600
But'fly Ter	1	.19	.18½	.20	.19	.19	.18	.19	.17½	.18½	.17	.16	......	9,000
Cent'l Con	1	.04¼	.03⅝	.04⅛	.03½	......	......	.04½	.03	.05	.03	.04¼	.03	6,000
Champion	1	.02½	.02	.02½	.02	.02½	.02	.02½	......	.02¾	.02⅝	.02	......	......
C. K. & N	1	......	......	.05¾	.05⅜	.05½	.05⅜	.05⅜	.05¼	.05½	.05⅜	.05⅜	.05½	20,000
Columbine-Victor	1	.08	.07¾	.08¼	.07⅛	.08	.07½	.08	.07½	.08	.06¼	.08	.07½	22,000
C. C. G. Ext	1	.05⅛	.04¾	.05⅛	.04¾	.05	.04½	.05	.04⅝	.05⅛	.04¾	.05	.04¾	1,000
C. C. & Mn	1	.03½	.03	.03½	.03	.03	.02½	.02⅞	.02½	......	......	.02⅞	.02¾	16,000
Cr'de & C. C	1	.04	......	.04	.03	.04	.03	.04	.03	.04	.03	.04½	.03½	2,000
C. C. Con	1	.06⅝	.06¼	.06½	.06	.06½	.06	.06⅛	.05⅞	.06¼	.05¾	.06	.05⅞	21,000
Dante	1	.04¼	.04⅛	.04⅜	.04⅛	.04	.03⅞	.03⅞	.03⅝	.04	.03⅞	.04	.03⅞	27,500
Dr. Jack Pot	1	.37½	.33	.37⅞	.36	.34	.33	.35¼	.35	.34¾	.34¾	.34¾	.34⅝	87,500
Echo	1	.01½	.01⅛	.01½	.01¼	.01½	.01⅛	.01½	......	.01½	......	.02	......	1,000
Elkton, Con	1	.72⅝	.72⅛	.70	.69½	.70	.69¾	.73	.71	.73½	.73⅛	.75	.74¾	54,117
El Paso, G	1	.44½	.44	.44	.43½	.43	......	.44	.43½	.43⅞	.43½	.44¼	.44	41,000
Fanny Rawlings	1	.10	.05	.10	.05	.10	.05	.10	.05	.07	.05	.07	.05	......
Findley	1	..	......	.11	.09⅞	.11	.10	.09¾	.09½	.10	......	.10	.09	5,000
Gold Dollar	1	.05	......	.05	.04	.05	.03	.05	.04	.04½	.04	.05	......	2,000
Gold Dollar Con	1	.15	......	.15	......	.15	......	.15	......	.14	......	.14	......	6,325
Gold Cycle	1	.66	.63	.62	.62½	.62	.60	.61	.60	.62	60	.61	.60	18,300
Gold Fleece	1	.25	.23	.40	.25	.26	......	.40	.25	.35	.26	.30	.25	600
Gold Knob	1	.01⅝	.01½	.02½	......	.02½	......	.02¼	.02	.02	.01	......	......	2,000
Gold Sov'n	1	.03	......	.03	.02⅝	.03	......	.02⅞	......	.03	......	.03	......	......
Hart	1	.04	......	.04	......	.04	......	.04	......	.04	......	.04	......	......
Ida May	½	.15	.08	.15	.08	.15	.08	.15	.08	.68	......	.08	......	......
Ironclad	1	.33½	.03	.03	......	.03	......	.03	......	......	......	.03½	......	......
Isabella	1	.25½	.25	.26	.25	.25¼	.25	.25¼	.25⅛	.25	.24¾	.25⅛	.24⅞	16,800
Jack Pot	1	.30	.27	.30	.27½	.26	.22½	.25	.24	.26	.22	.24½	.22	3,400
Last Dollar	1	.60	.47¾	.40	......	.45	......	.55	.45	.60	.46	......	......	......
Lexington	1	.06	.05¾	.06	.05½	.06	.05⅞	.06¼	.06	.06½	.06	.06⅞	.06⅝	19,000
Little Nell	1	.03	.02⅞	.03	.02⅞	.03	.02⅞	.03	......	.03	......	.03	......	1,000
Little Puck	1	.07	.05¾	.07	.05	.05¾	.05¼	.06	.05⅜	.05¾	.05⅜	.05½	.05⅜	8,000
Matoa	1	.07	......	.07	......	.07	......	.07	......	.07	......	.07	......	9,000
Midway	1	.03½	.03⅜	.03½	.03¼	.03½	.03¼	.03⅜	.03¼	.03	......	.03½	.03⅛	3,000
Mint	1	.05	.04½	.04⅞	.04¾	.05	.04	.05	.04	.04⅞	.04¼	.04⅞	.04¼	......
Missouri	1	......	......	......	......	.02⅜	.02	.02½	.02	.03	......	.03	.02	......
Mobile	1	......	......	.02	......	.01½	......	.01½	......	.01½	.01¼	.01½	.01⅛	10,000
Moll Dwyer	1	......	......	......	......	......	......	......	......	......	......	......	......	......
Mol. Gibson	1	.13	.11½	.13	.12	.13	.11½	.13	.10	.14	.11½	.14	.12½	2,000
Monarch	1	......	......	......	......	.02	......	.02	......	.02	......	.14	.13¼	......
Montreal	1	.01¼	......	.01¼	......	.01¼	......	.01¼	......	.01¼	......	.01¼	......	......
Moon A'c'r	1	.15	.14⅝	.14½	......	.15	......	.14¾	.13⅝	.14⅞	.13¼	.14	.13¼	5,000
Morn'g Star	1	......	......	.02⅛	.01½	.02	.01⅜	.02	.01½	.02	.01⅝	.02	.01⅝	23,000
National	1	.01	......	.02	.01½	.02½	......	.02	.01½	.01⅝	......	.01⅝	.01¼	16,900
Nellie, V	1	.02⅛	.01¾	.02	.01⅝	.02½	......	.02	.01⅜	.02	......	.02	.01½	2,750
New Haven	1	.03½	.03⅛	.03¼	.03	.03⅛	.03	.03¼	.03	.03⅛	.02½	.03⅛	......	4,000
Olive Branch	1	.01⅜	.01⅛	.01½	......	.01½	......	.01½	.01	......	......	.02	......	7,000
Oriole	1	.01¾	......	.01¾	......	.01⅝	......	.01⅝	......	......	......	......	......	......
Pappoose	1	......	......	.02¼	.02	.02¼	.02	.02¼	.02	.02⅛	......	.02	......	2,000
Pharmacist	1	.04¼	.04	.04¼	.04	.04¼	.04	.04½	.04	.04¼	.04	.04¼	.04	5,900
Pilgrim	1	......	......	.04½	.04	.04¼	.04	.04¼	.04	......	......	.04¼	.04	......
Pinnacle	1	......	......	.06	......	.06½	.06	.06	......	.06½	.06	.06½	.06	......
Pointer	1	.03	.02¾	.03	......	.02¼	.02½	.02¾	.02½	.02⅛	.02	.02¾	.02	5,000
Portland	1	2.00	1.90	1.75	1.73½	1.67½	1.65¾	1.85	1.72½	1.86¾	1.85	1.95	1.72¾	27,000
Prince Alb	1	.03	.02⅝	.02⅞	.02½	.02⅞	.02½	.02⅞	.02½	.02⅞	.02½	.02⅞	.02	......
Princess	1	......	......	......	......	......	......	......	......	......	......	......	......	......
Progress	1	.04¼	.03¼	.03½	.03	.04	.03¼	.04¼	.03	......	......	.04¼	.03¼	1,000
Pythias	1	......	......	......	......	.01¼	......	.01¼	......	.01¼	......	......	......	......
Republic	1	......	......	.02½	......	.02½	.01½	.02½	......	.02½	......	.02½	.01½	50,000
Rob. Burns	1	......	......	......	......	.02	......	.02	.01½	.02	.01½	.02	.01½	2,000
Rose Maud	1	.03½	.03	.03⅛	.03¼	.03¼	.03	.03¼	.03⅛	.03¼	.03	.03¼	......	7,000
Rose Nicol	1	.04	......	.04	.02⅝	.04	.03	.04½	.03½	.03¼	.03	.04	.03¼	......
Sunset Eclipse	1	.07⅝	.07⅛	.06⅞	.06¾	.08½	.06¼	.07	.06½	.06½	.05¾	.07	.06⅝	28,100
Uncle Sam	1	......	......	......	......	.01⅞	.01	.01⅞	.01	.01⅞	.01	.01⅞	.01	......
Union	1	......	......	.03	.01	.03	.01	.03	.01	.03	.01	.03	.01	......
Vindicator	1	1.05	......	1.00	.99	.98	.95	.99	.97	1.03	.99	......	......	14,400
Va. M	1	......	......	......	......	......	......	......	......	......	......	......	......	......
Work	1	.06¾	.03½	.06⅝	.06⅜	.06¼	.06	.06¾	.06⅝	.06⅞	.06½	.07½	.06	17,000

Total sales 666,692 shares.

Colorado Springs (*By Telegraph.*)

Name of Company.	par val	Apr. 17. H.	L.	Apr. 18. H.	L.	Apr. 19. H.	L.	Apr. 21. H.	L.	Apr. 22. H.	L.	Apr. 23. H.	L.
Acacia	$1	.10	.08	.10	.08⅝	.10	.08⅞	.09⅞	.08¼	.10	.08¾	.09½	.09
Alamo	1	.03¾	.03¼	.03⅞	.03¼	.03¾	.03	.03⅝	.03	.03⅝	.03¼	.03⅛	.03¼
Anaconda	1	.20	.14	.18	.16	.18	.16	.18	.17	.18½	.17	.19	.17
Argentum	1	.04	.03½	.05	.02	.04	.03	.04	.02	.04	.03	.04	.03
Battle Mt	1	.17	.15	.16¾	.14	.17	.16	.17	.15	.17	.14	.17	.14
Butterfly Ter	1	.19	.17½	.18½	.17	.19	.16	.20	.17	.20	.18	.21	.19
Cripple Creek Con	1	.03⅛	.05⅞	.06¾	.05¾	.06	.05⅞	.06¼	.06	.06⅛	.06¼	.07	.06¼
Dr. Jack Pot	1	.35¼	.35	.34¾	.34⅝	.34¾	.34⅝	.38⅞	.38	.40	.37½	.38¼	.37
El Paso	1	.44	.43⅛	.43⅞	.43⅛	.44¼	.44	.47	.46½	.46	.45	.45⅞	.45
Elkton, Con	1	.72	.71	.73½	.73⅜	.75	.74¾	.74½	.73⅞	.73⅛	.72¼	.72½	.71⅛
Fanny Rawlings	1	.10	.05	.07	.05	.07	.05	.07	.05	.07	.05	.06½	.05
Findlay	1	.09¾	.09½	.10	.09	.10	.09	.10	.09⅝	.10	.09½	.10⅜	.09¾
Gold Dollar Cons	1	.15	.12	.14	.12	.14	.12	.14	.12	.13	.12	.12	.11½
Gold Sov'n	1	.02⅞	.02½	.03	.02½	.03	.02½	.03	.02½	.02¾	.02⅝	.02⅞	.02⅝
Golden Cycle	1	.61	.60	.62	.60	.61	.60	.62	.60½	.62½	.62	.62	.61
Golden Fleece	1	.40	.25	.35	.26	.50	.25	.45	.20	.30	.25	.30	.20
Hart	1	.05	.04	.05	.04	.05	.04	.05	.04	.05	.04	.05	.04
Isabella	1	.25¼	.25⅛	.25	.24⅝	.25⅛	.24⅞	.25	.24⅛	.24⅞	.24½	.24¾	.24
Jack Pot	1	.25	.24	26	.22	.24½	.22	.24¾	.24	.24½	.24	.25⅛	.24
Keystone	1	.03¾	.03¼	.03¾	.03½	.03¾	.03	.03½	.03	.04	.03	.04	.03¼
Last Dollar	1	.55	.45	.60	.42	.61	.42	.55	.47½	.54¾	.45	.55	.47½
Lexington	1	.06¼	.06	.06½	.06	.06⅞	.06⅝	.06⅝	.06½	.06¾	.06⅜	.06⅝	.06¼
Mollie Gibson	1	.13	.10	.14	.11½	.14	.11½	.11⅛	.11	.12½	.11	.11¾	.11
Moon Anchor	1	.14¾	.13⅝	.14⅞	.13¼	.14¾	.13¼	.15	.13	.15	.13	.15	.13
National	1	.02	.01⅛	.01¾	.01⅝	.01⅝	.01¼	.01⅝	.01¼	.01⅝	.01⅜	.01⅝	.01¼
New Haven	1	.03¼	.03	.03⅛	.02½	.03⅛	.02½	.03⅛	.02¼	.03⅛	.02½	.03	.03
Pharmacist	1	.04½	.04	.04¼	.04	.04¼	.04	.04¼	.04	.04⅛	.04	.04¼	.04
Pinnacle	1	.06½	.06	.06½	.06	.06½	.06	.06½	.06	.06½	.06	.06½	.06
Portland	1	1.85	1.72½	1.86¾	1.85	1.95	1.92½	1.92	1.91	1.90	1.89	1.85	1.83
Sunset Eclipse	1	.07	.06½	.06¾	.06½	.06¾	.06½	.07¼	.07⅛	.07¾	.07⅝	.07½	.07¼
Vindicator, Con	1	.99	.97	1.03	.99⅞	1.00	.94¼	.99½	.95	.99	.95	.99½	.95
Work	1	.06¾	.06⅝	.06⅞	.06½	.07½	.06⅞	.07½	.06⅞	.07	.06½	.06½	.06¼

MONTREAL, CANADA. Apr. 21.

Name of Company.	par val	H.	L.	Sales	Nome of Company.	par val	H.	L.	Sales
Big Three	$1	.01¼	......	......	Montreal-London	$0.24	.02½	......	......
California	1	.04½	.04	......	Noble Five	1	......	......	......
Can. Gold Fields	0.10	......	......	......	Novelty	1	......	......	......
Deer Trail Con	1	.03½	.02¼	......	North Star	....	.23	......	1,000
Evening Star	1	.04	.02	......	Payne	1	.17	......	2,000
Golden Star	1	.04¼	.03	......	Rambler-Cariboo	1	......	......	......
Gold Hills Dev	1	.01½	......	......	Republic Con	1	.10	......	......
Knob Hill	1	......	......	......	Slocan-Sovereign	1	.02¼	......	......
Monte Christo	1	.02	......	......	Virtue	1	.23½	.23	......
treal, G. F.	1	.02½	......	......	War Eagle	1	.17	.11	4,000

LONDON. Apr. 9.

Name and Country of Company	Authorized Capital.	Par value.	Last dividend. Amt.	Date	Quotations. Buyers.	Sellers.
	£	£. s. d.	s. d.		£. s. d.	£. s. d.
Alaska-Treadwell, g., Alaska	1,000,000	5 0 0	1 6	Jan., 1902	4 0 0	4 5 0
Anaconda, c. s., Montana	6,000,000	5 0 0	2 0	May, 1902	5 16 3	5 18 9
Copiapo, c., Chile	200,000	2 0 0	2 6	Dec., 1901	2 2 6	2 7 6
De Lamar, g. s., Idaho	400,000	1 0 0	2 0	Dec., 1901	17 6	1 2 6
El Oro, g., Mexico	1,000,000	1 0 0	1 3	July, 1901	1 10 0	1 12 6
Enterprise, g., British Col	200,000	1 0 0			7 6	12 6
Frontino & Bolivia, g., Columbia	140,000	1 0 0	3 0	July, 1901	1 2 6	1 5 0
Hall Mg. & Sm., c. s., British Col	325,000	1 0 0			5 0	6 0
Le Roi, g., British Col	1,000,000	5 0 0	5 0	Nov., 1899	4 2 6	4 5 0
Le Roi No. 2, g., British Col	120,000	5 0 0	5 0	July, 1901	5 1 3	5 3 9
Mesquital, g., Mexico	25,000	2	4	July, 1901	4 0	5 0
Montana, g. s., Montana	660,000	1 0 0	6	April, 1899	3 9	4 3
Mountain Copper, California	1,250,000	5 0 0	4	Oct., 1901	4 5 0	4 10 0
Parral, g. s., Mexico	30,000	2	5 0		9 6	10 6
Stratton's Independence, Colorado	1,100,000	1 0 0	1 0	Jan., 1902	5 0	7 6
St. John del Rey., g., Brazil	600,000	1 0 0	1 0	June, 1901	17 6	18 6
Utah Con., g., (High. Boy), Utah	300,000	1 0 0	5 0	May, 1901	4 5 0	4 15 0
Ymir, g., British Col	200,000	1 0 0	1 0	Mar., 1902	1 18 6	2 1 3
European:						
Linares, l., Spain	45,000	3 0 0	7 0	March, 1901	3 0 0	4 0 0
Mason & Barry, c., sul., Port'g'l	420,000	1 0 0	12 6	May, 1901	3 17 6	4 2 6
Rio Tinto, c., Spain	1,625,000	5 0 0	37s 6d	April, 1902	44 0 0	44 5 0
Rio Tinto, pref., Spain	1,625,000	5 0 0	2s 6d	April, 1902	6 0 0	6 5 0
Tharsis, c., Spain	1,250,000	2 0 0	12 0	April, 1902	5 17 6	6 2 5
Australia and New Zealand:						
Assoc. Gold Mines, W. Australia	500,000	1 0 0	1 6	Jan., 1900	1 7 6	1 8 9
Br'ken Hill Pr'p., s., N. S. Wales	384,000	8 0	1 0	Nov., 1901	1 11 3	1 13 9
Great Bo'd'r Pr'p., W. Australia	175,000	2 0	6	Jan., 1902	18 9	19 3
Hannan's Brownhill, g., W. Australia	140,000	1 0 0	7 6	Oct., 1900	2 10 0	2 12 6
Ivanhoe Gold C'p., W. Australia	1,000,000	5 0 0	3 0	Feb., 1902	7 8 9	7 11 3
Kalgurlie, g., W. Australia	120,000	1 0 0	rts.	Oct., 1899	3 13 3	3 13 9
Lake View Cons., g., W. Australia	250,000	1 0 0	5 0	Oct., 1901	3 7 6	3 10 0
Mt. Lyell M. E. R. I., c., Tasmania	900,000	3 0 0	4 0	Jan., 1902	3 15 0	3 17 6
Mt. Morgan, g., Queensland	1,000,000	1 0 0	3	Mar., 1902	3 18 9	4 2 6
Waihi, g., New Zealand	330,000	1 0 0	2 6	Mar., 1902	5 10 0	5 12 6
Indian:						
Champion Reef, g., Colar Fields	234,169	10 0	7 8	Jan., 1902	5 15 0	5 17 6
Mysore Gold, Colar Fields	265,000	10 0	5 0	Mar., 1902	6 13 9	6 13 3
Nundydroog, g., Colar Fields	242,000	10 0	1 6	Nov., 1901	1 15 0	1 17 6
Ooregum, g., Colar Fields	290,000	10 0	1 6	Dec., 1901	2 6 3	2 8 9
Ooregum, pref., g., Colar Fields	240,000	10 0	1 6	Dec., 1901	2 13 9	2 16 3
African:						
British S. Africa, chartered S. Africa	5,000,000	1 0 0	rts.	May, 1899	3 11 3	3 13 9
Cape Copper, S. Africa	600,000	2 0 0	8 0	Jan., 1902	4 7 6	4 12 6
Cape Copper, pref., S. Africa	150,000	2 0 0	8 0	Jan., 1902	4 0 0	4 5 0
City and Sub'n (New), g., Transvaal	1,360,000	4 0 0	3 0	Aug., 1899	7 5 0	7 7 6
Crown Reef, g., Transvaal	120,000	1 0 0	18 0	Nov., 1899	17 10 0	18 0 0
De Beers Con., d., pref., Cape Colony	....	....	....	....	18 15 0	18 17 6
De Beers Con., def.	....		....	....	24 13 9	24 16 3
Ferreria g., Transvaal	90,000	1 0 0	10 0	Jan., 1902	25 10 0	26 10 0
Geldenhuis Est., g. Transvaal	200,000	1 0 0	10 0	Aug., 1899	7 3 9	7 6 3
Henry Nourse, g., Transvaal	125,000	1 0 0	10 0	Aug., 1899	9 5 0	9 10 0
Jagersfontein, d., Orange F. S.	1,000,000	5 0 0	6 0	Dec., 1900	26 15 0	27 5 0
Joh'n'b'g Con. Invet., S. Africa	2,750,000	1 0 0	2 0	Nov., 1899	3 16 3	3 17 6
Jubilee, g., Transvaal	50,000	1 0 0	5 0	Aug., 1899	6 17 6	7 2 6
Langlaagte Est., g., Transvaal	470,000	1 0 0	3 0	Sept., 1899	4 3 7	4 6 3
May Con., g., Transvaal	290,000	1 0 0	0 6	Aug., 1899	4 17 6	5 0 0
Meyer & Charlton, g., Transvaal	100,000	1 0 0	3 0	Feb., 1902	5 15 0	6 0 0
Namaqua, c., Cape Colony	200,000	2 0 0	3 0	Feb., 1902	3 15 0	4 0 0
Primrose (New), g., Transvaal	300,000	1 0 0	6 0	Aug., 1899	4 13 9	4 16 3
Rand Mines, g., S. Africa	1,795,956	5 0	15 0	Aug., 1899	12 3 9	12 6 0
Robinson, g., Transvaal	2,750,000	5 0 0	8 0	Aug., 1899	10 17 6	11 0 0
Sheba, g., Taansvaal	1,100,000	1 0 0	5 0	Feb., 1902	1 6 3	1 7 6
Sim. & Jack (new) g., Transvaal	....	1 0 0	....	....	2 0 0	2 2 6
Wolhuter, g., Transvaal	860,000	4 0 0	2 0	Feb., 1899	5 7 6	5 12 6

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

PARIS. Apr. 3.

Name of Company.	Country.	Product.	Capital Stock.	Par value.	Latest divs.	Prices. Opening.	Closing
			Francs.	Fr.	Fr.	Fr.	Fr.
Acieries de Creusot	France	Steel mfrs.	27,000,000	2,000	85.00	1,710.00	1,708.00
" " Firminy	"	" "	3,000,000	500	200.00	2,690.00	2,715.00
" " Huta-Bank	Russia	Iron and Steel	....	500	....	3,295.00	3,290.00
" " la Marine	France	Steel mfrs.	20,000,000	500	65.00	1,360.00	1,370.00
Anzin	"	Coal	....	....	320.00	5,160.00	5,155.00
Boleo	Lower Cal.	Copper	....	500	176.00	1,895.00	1,820.00
Briansk	Russia	Coal and Iron	....	500	....	404.00	404.00
Champ d'Or	S. Africa	Gold	3,375,000	25	3.75	36.00	36.00
Courrieres	France	Coal	600,000	300	90.00	2,280.00	2,287.00
Dombrowa	Russia	"	....	500	75.00	985.00	981.00
Dourges	France	"	12,000,000	500	1,000	24,700.00	24,700.00
Dynamite Centrale	"	Explosives	....	500	19.00	720.00	697.00
Escombrera-Bleyberg	Spain	Lead	....	500	50.00	824.00	830.00
Fraser River	Brit. Col'mb.	Gold	250,000	25	....	7.00	7.00
Huanchaca	Bolivia	Silver	40,000,000	125	5.00	140.00	140.00
Laurium	Greece	Zinc and Lead.	16,300,000	500	25.00	380.00	375.00
Malfidano	Italy	Zinc	12,500,000	500	12.50	415.00	384.00
Metaux, Cle. Fran. de	France	Metal dealers	25,000,000	500	22.50	452.00	479.00
Mokta-el-Hadid	Algeria	Iron	18,312,500	500	35.00	879.00	870.00
Napthe Baku	Russia	Petroleum	....	....	....	387.50	464.00
Napthe Nobel	"	"	....	....	....	500.00	540.00
" " parts	"	"	....	....	....	10,000.00	10,900.00
Nickel	N. Caled'nia	Nickel	10,000,000	250	20.00	530.00	544.00
Penarroya	Spain	Coal, etc	....	500	55.00	1,115.00	1,095.00
Rebecca	Colo'do, U. S.	Gold	5,000,000	25	....	2.00	2.00
Salines de l'Est	France	Salt	....	500	6.00	287.00	290.00
Salines du Midi	"	"	....	500	40.00	925.00	911.00
Vielle Montagne	Belgium	Zinc	9,000,000	30	30.00	560.00	565.00

TORONTO, ONT.

Name of Company.	par val	Apr. 15. H.	L.	Apr. 16. H.	L.	Apr. 17. H.	L.	Apr. 18. H.	L.	Apr. 19. H.	L.	Apr. 21. H.	L.	Sales
Ontario:														
Olive	1	.06	.04	.06	.04	.06	.04	.06	.04½	.06	.05	.06	.04½	.....
British Columbia:														
Cariboo McK	1	.27	.24	.27	.25½	.28	.26	.30	.27	.30	.26½	.30	.26	......
Center Star	1	.40	.38¼	.40½	.39½	.41	.39½	.41	.39	.41	.38½	.40	.36	1,000
Deer Trail	1	.03¼	.02½	.03¼	.02½	.03¼	.02⅝	.03	.02½	.03	.02½	.03¼	.02½	......
Fairview	1	.04½	.04	.04½	.04	.04½	.04	.04½	.04	.04½	.04⅛	.04½	.04	......
Lone Point	1	.08½	.07	.08	.07	.08	.07	.08¼	.07	.08	.07	.08	.07	......
Morrison	1	.05	......	.06	......	.06	......	.06	......	.06	......	.06	......	......
Mt. Lion	1	.34	.27	.35	.28	.34	.27	.35	.28	.33	.25	.35	.28	......
North Star	1	.24	.22	.23½	.22½	.24	.23	.24	.22	.24	.23	.24	.22	3,500
Payne	1	.30	.27½	.29¾	.27¾	.30	.28¾	.30	.27	.30	.28½	.31	.27	......
Rambler	1	.90	.85	.89	.85	.90	.85	.90	.85	.95	.85	.90	.87½	......
Republic	1	.10½	.10	.10⅜	.10	.10½	.09¾	.10¼	.09¾	.10½	.09½	.10½	.09½	10,000
Virtue	1	.25	.20	.25	.20	.25	.20	.25	.20	.24	.20	.25	.20	......
War Eagle Cons	1	.12	.11	.12¾	.12	.13	.12½	.15	.14	.15	.13½	.17	.16	7,000
Winnipeg	1	.05	.02½	.05	.02½	.05	.02½	.05	.05	.05	.04½	.05	.03⅜	......
Wonderful	1	.04	......	.04	......	.05	......	.04	......	.05	......	.04	......	......
Develop. Co														
Can. G. F. S.	1	.04½	.04	.04½	.04	.04½	.04	.04½	.04	.04½	.04	.04½	.04	......

Total sales, 21,500 shares. †Ex-dividend.

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES.

Abrasives—	Cust. Meas.	Price.
Carborundum, f.o.b. Niagara Falls, Powd., F. FF. FFF..	lb.	$0.08
Grains	"	.10
Corundum, N. C	"	.07@.10
Chester, Mass	"	.04½@.05
Barry's Bay, Ont		.07¼@.09¼
Crushed Steel, f.o.b. Pittsburg	"	.05½
Emery, Turkish flour, in kegs	"	.03½
Grains, in kegs	"	.05@.05½
Naxos flour, in kegs	"	.03½
Grains, in kegs	"	.05@.05½
Chester flour, in kegs	"	.03½
Grains, in kegs	"	.05@.05½
Peekskill, f.o.b. Easton, Pa., flour, in kegs	"	.01½
Grains, in kegs	"	.02½
Crude, ex-ship N. Y.: Abbott (Turkey)	lg. ton	26.50@30.00
Kuluk (Turkey)	"	22.00@24.00
Naxos (Greek) h. gr	"	.26.00
Garnet, as per quality	sh. ton	25.00@35.00
Pumice Stone, Am. powd	lb.	.01½@.02
Italian, powdered	"	.01½
Lump, per quality	"	.04@.40
Rottenstone, ground	"	02½@.04½
Lump, per quality	"	.06@.20
Rouge, per quality	"	.10@.30
Steel Emery, f.o.b. Pittsburg	"	.07
Acids—		
Boracic, crystals	"	.10¾@.11
Powdered	"	.11¼@.11½
Carbonic, liquid gas		.12½
Chromic, crude		.20
Hydrofluoric, 30%	"	.05
48%	"	.05
Best		.25
Sulphurous, liquid anhy	"	.06
Alcohol—Grain	gal.	2.45
Refined wood, 95@97%	"	.60@.65
Purified	"	1.20@1.50
Alum—Lump	100 lbs.	1.75
Ground	"	1.80
Powdered	"	3.00
Chrome, com'l	"	2.75@3.00
Aluminum—		
Nitrate	lb.	1.50
Oxide, com'l, common	"	.06½
Best	"	.20
Pure	"	.80
Hydrated	100 lbs.	2.60
Sulphate, pure	"	1.50@2.00
Com'l	"	1.15@1.25
Ammonia—		
Aqua, 16°	lb.	.03
18°	"	.03¼
20°	"	.03¾
26°	"	.05½
Ammonium—		
Carbonate, lump	"	.08¼@.08½
Powdered	"	.09¼@.09½
Muriate, grain	"	.05⅝
Lump	"	.08⅝
Nitrate, white, pure (99%)	"	.12
Phosphate, com'l	"	.09
Chem., pure	"	.60
Antimony—Glass	"	.30@.40
Needle, lump	"	.05¼@.06
Powdered, ordinary	"	.05¾@.07¼
Oxide, com'l white, 95%	"	.09½
Com'l white, 99%	"	.12
Com'l gray	"	.07
Sulphuret com'l	"	.16
Arsenic—White	"	.03¼@.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	100 lbs.	1.67½@1.76
Chem. pure cryst	lb.	05
Nitrate, powdered	"	.05¼

Barium –	Cust. Meas.	Price
Oxide, Am. hyd. cryst	lb.	$0.02¾
Sulphate (Blanc Fixe)	"	.02
Barytes—		
Am. Crude, No. 1	sh. ton	9.00
Crude, No. 2	"	8.00
Crude, No. 3	"	7.75
German, gray	"	14.50
Snow white	"	17.00
Bauxite—Ga. or Ala. mines:		
First grade	lg. ton	5.50
Second grade	"	4.75
Bismuth—Subnitrate	lb.	1.40
Subcarbonate	"	1.65
Bitumen—"B"	"	.03½
"A"	"	.05
Bone Ash	"	.02¼@.02½
Borax	"	.07¼@.07½
Bromine	"	.40
Cadmium—Metallic	"	1.40
Sulphate	100 lbs.	2.00@2.50
Calcium—Acetate, gray	"	1.30
" brown	"	.90
Carbide, ton lots f.o.b. Niagara Falls, N. Y.. or Jersey City, N. J	sh. ton	75.00
Carbonate, ppt	lb.	.05
Chloride,	sh. ton,	9.00@10.00
Cement—		
Portland, Am., 400 lbs	bbl.	1.70@1.90
Foreign	"	1.65@2.25
"Rosendale," 300 lbs	"	.75
Slag cement, imported	"	1.65
Ceresine—		
Orange and Yellow	lb.	.12
White	"	.13½
Chalk—Lump, bulk	sh. ton	2.75
Ppt. per quality	lb.	.03¾@.06
Chlorine—Liquid	"	.30
Water	"	.10
Chrome Ore—		
(50% ch.) ex-ship N. Y	lg. ton	24.75
Sand, f.o.b. Baltimore	"	33.00
Bricks, f.o.b. Pittsburg	M	175.00
Clay, China—Am. com., ex-dock, N. Y	lg. ton	8.00
Am. best, ex-dock, N. Y	"	9.00
English, common	"	12.00
Best grade	"	17.00
Fire Clay, ordinary	sh. ton	4.25
Best	"	6.00
Slip Clay	"	5.00
Coal Tar Pitch	gal.	.08
Cobalt—Carbonate	lb.	1.75
Nitrate	"	1.50
Oxide—Black	"	2.26@2.30
Gray	"	2.28@2.40
Smalt, blue ordinary	"	.06
Best	"	.20
Copperas	100 lbs.	.30@.35
Copper—Carbonate	lb.	.18@.19
Chloride	"	.25
Nitrate, crystals	"	.35
Oxide, com'l	"	.19
Cryolite	"	.06½
Explosives—		
Blasting powder, A	25 lb. keg	2.65
Blasting powder, B	"	1.40
"Rackarock," A	lb.	.25
"Rackarock," B	"	.18
Judson R.R. powder	"	.10
Dynamite (20% nitro-glycerine)	"	.13
(30% nitro-glycerine)	"	.14
(40% nitro-glycerine	"	.15
(50% nitro-glycerine)	"	.16½
(60% nitro-glycerine)	"	.18
(75% nitro-glycerine)	"	.21
Glycerine for nitro (32 2-10° Be.)		.12⅞@.13
Feldspar—Ground	sh. ton	8.00@9.00
Flint Pebbles—Danish, Best	lg. ton	14.75
French, Best	"	11.75
Fluorspar—		
Am. lump, 1st grade	sh. ton	$14.40
2d grade	"	13.90
Gravel and crushed, 1st gr	"	13.40
2d grade	"	12.40
Ground, 1st grade	"	17.90
2d grade	"	16.50
Foreign, lump	"	8.00@12.00
Ground	"	11.50@14.00
Fuller's Earth—Lump	100 lbs.	.75
Powdered	"	.85

Graphite—Am. f.o.b. Providence, R. I., lump	Cust. Meas. sh. ton	Price $8.00
Pulverized	"	30.00
German, som. pulv	lb.	.01¼@.01½
Best pulverized	"	.01½@.02
Ceylon, common pulv	"	.02¾@.03½
Best pulverized	"	.04@.08
Italian, pulv	"	.01¼
Gypsum—Ground	sh. ton	8.00@8.50
Fertilizer	"	7.00
Rock	lg. ton	4.00
English and French	"	14.00@16.00
Infusiorial Earth—Ground.		
American, best	"	20.00
French	"	37.50
German	"	40.00
Iodine—Crude	100 lbs	2.45
Iron—Muriate	lb.	.05
Nitrate, com'l	"	.01¼
True	"	.04
Oxide, pure copperas col	"	.05@.10
Purple-brown	"	.02
Venetian red	"	.01@.01½
Scale	"	.01@03
Kaolin—(See Clay, China.)		
Kryolith—(See Cryolite.)		
Lead—Acetate, white	"	.07¾@.08
Brown	"	.06
Nitrate, com'l	"	.06½
" gran	"	.08¼
Lime—Com., abt. 250 lbs	bbl.	.80
Finishing	"	.90
Magnesite—Greece.		
Crude (95%)	lg. ton	6.50@7.00
Calcined	sh. ton	14.00@15.00
Bricks	M	170.00
Am. Bricks, f.o.b. Pittsburg	"	175.00
Magnesium—		
Carbonate, light, fine pd	lb.	.05
Blocks	"	.07@.09
Chloride, com'l	"	.01¾
Fused	"	.20
Nitrate	"	.60
Sulphate	100 lbs.	.75@.95
Manganese—Powdered, 70@75% binoxide	lb.	.01¼@.01½
Crude, pow'd.		
75@85% binoxide	"	.01½@.02¼
85@90% binoxide	"	.02¼@.03¼
90@95% binoxide	"	.03¼@.05½
Carbonate	"	.16@.20
Chloride	"	.04
Ore, 50%, Foreign	unit	.20@.21
Domestic	"	.30
Marble—Flour	sh. ton	6.00@7.00
Mercury—Bichloride	lb.	.77
Mica—N. Y. gr'nd, coarse	"	.03@.04
Fine	"	.04@.05
Sheets, N. C., 2x4 in	"	.30
3x3 in	"	.80
3x4 in	"	1.50
4x4 in	"	2.00
6x6 in	"	3.00
Mineral Wool—		
Slag, ordinary	sh. ton	19.00
Selected	"	25.00
Rock, ordinary	"	32.00
Selected	"	40.00
Nickel—Oxide, No. 1	lb.	1.00
No. 2	"	.60
Sulphate	"	.20@.21
Oils—Black, reduced 29 gr.:		
25@30, cold test	gal.	.09¾@.10¼
15, cold test	"	.10¾@.11¼
Zero	"	.11¾@.12¾
Summer	"	.09¼@.09¾
Cylinder, dark steam ref	"	.08¾@.10¾
Dark, filtered	"	.11¼@.15¾
Light filtered	"	.14¾@.17¾
Extra cold test	"	.21¾@.26¾
Gasoline, 86°@90°	"	.14@.19
Naphtha, crude, 68°@72°	bbl.	9.05
"Stove"	gal.	.12
Linseed, domestic raw	"	.62@.63
Boiled	"	.65
Calcutta, raw	"	.85
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. powd	"	.04¾@.05¼
English flake	"	.08¼@.08½
Glassmakers'	"	.07¾@.08

Paints and Colors—	Cust. Meas.	Price
Metallic, brown	sh. ton	$ 19.00
Red	"	16.00
Ocher, Am. common	"	9.25@10.00
Best	"	21.25@25.00
Dutch, washed	lb.	.04¾
French, washed	"	.01¼@.01⅞
Orange mineral, Am	"	.07¼@.07½
Foreign, as to make	"	.07¾@.11⅜
Paris green, pure, bulk	"	.12@.12¼
Red lead, American	"	.05¼@.05¾
Foreign	"	.06⅜@.08
Turpentine, spirits	gal.	.46 @.46½
White lead, Am., dry	lb.	.04¼@.04½
American, in oil	"	.05¼@.05¾
Foreign, in oil	"	.07½@.09½
Zinc, white, Am., ex dry	"	.04⅜@.04⅝
American, red seal	"	.06½
Green seal	"	.07
Foreign, red seal, dry	"	.05¾@.08½
Green seal, dry	"	.06½@.06¼
Potash—		
Caustic, ordinary	"	.04⅞@.06
Elect. (90%)	"	.06½
Potassium—		
Bicarbonate cryst	"	.03¼
Powdered or gran	"	.14
Bichromate, Am	"	.08½@.08¾
Scotch	"	.08½@.09
Carbonate, hydrated	"	.04@.04¼
Calcined	"	.03½@.03¾
Chromate	"	.35
Cyanide (98@99%)	"	.23
Kainit	lg. ton	9.05
Manure salt, 20%	100 lbs.	.66
Double Manure salt, 48@53%	"	1.12
Muriate, 80@85%	"	1.83
95%	"	1.86
Permanganate	lb.	.09½@.10½
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.	3.50@3.55
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	"	37½
Oxide	"	85.@1.10
Sodium—		
Bichromate	lb.	.06¾
Chlorate, com'l	"	.07⅞@.08¼
Hyposulphite, Am	100 lbs.	1.60@1.65
German	"	1.70@1.90
Peroxide	lb.	.45
Phosphate	"	.02¼@.03
Prussiate	"	.10½@.11
Silicate, conc	"	.05
Com'l	"	.01
Sulphate, com'l	100 lb.	.77½
Sulphide	lb.	.01¾
Sulphite crystals	"	.02¼
Sulphur—Roll	100 lbs.	1.85
Flour	"	1.90
Flowers, sublimed	"	2.15
Talc—N. C., 1st grade	sh. ton	13.75
N. Y., Fibrous, best	"	10.20
French, best	100 lbs.	1.25
Italian, best	"	1.62½
Tar—Regular	bbl.	1.85
Oil barrels	"	3.75
Tin—Crystals	lb.	.20@.21½
Oxide	"	.42
Uranium—Oxide	"	2.25@3.00
Zinc—Metallic, ch. pure	"	.07@.09¾
Carbonate	"	.15
Chloride	"	.05
Dust	"	.05½@.05¾
Sulphate	"	.02⅛@.02¾

THE RARE EARTHS.

	Cust. Meas.	Price
Boron—Nitrate	lb.	$1.50
Calcium—Tungstate (Scheelite)	"	.60
Cerium—Nitrate	"	11.00
Didymium—Nitrate	"	35.00
Erbium—Nitrate	"	40.00
Glucinum—Nitrate	"	20.00
Lanthanum—Nitrate	"	30.00
Lithium—Nitrate	oz.	.60
Strontium—Nitrate	lb.	06¾@07
Thorium—Nitrate 49@50%	"	5.00
Uranium—Nitrate	oz.	.25
Yttrium—Nitrate	lb.	40.00
Zirconium—Nitrate	"	8.00

NOTE.—These quotations are for wholesale lots in New York unless otherwise specified, and are generally subject to the usual trade discounts. Readers of the ENGINEERING AND MINING JOURNAL are requested to report any corrections needed, or to suggest additions which they may consider advisable. See also Market Reviews.