

The Engineering and Mining Journal

WITH WHICH IS CONSOLIDATED "MINING AND METALLURGY."

Vol. LXXIII.

NEW YORK, SATURDAY, June 21, 1902.

No. 25.

THE ENGINEERING AND MINING JOURNAL

(Incorporated.)

261 BROADWAY, NEW YORK.

TELEPHONE, 6866 CORTLANDT. P. O. BOX, 1833.
CABLE ADDRESS "ENGINJOUR" N. Y."

W. J. JOHNSTON, President. F. J. PRATT, Treasurer.
LUCIUS S. BIGELOW, Vice-Prest., and Gen'l Mgr.

CHICAGO (Telephone, Harrison 3326) 520 Monadnock Building
DENVER 206 Boston Building
SALT LAKE CITY Dooly Building
SAN FRANCISCO Mills Building
VANCOUVER, B. C. Molsons Bank Building
LONDON, ENG. 20 Bucklersbury, 368

DAVID T. DAY, PH.D. Editor in Chief
EDWARD W. PARKER Managing Editor
FREDERICK HOBART Associate Editor
ROSSITER W. RAYMOND, PH.D., M.E. Special Contributor

SUBSCRIPTION

Single Copies, 15 Cents.

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

CHANGE OF ADDRESS

Please give your old as well as your new address

NOTICE TO DISCONTINUE

Should be WRITTEN to the New York Office in every instance

ADVERTISING COPY

Should be at New York Office by 10 A. M. Tuesday of
issue week

Copyright, 1902, by ENGINEERING AND MINING JOURNAL
Entered at New York Post Office as Second Class Matter

CONTENTS.

Editorial Notes.....	853
Market Conditions.....	854
Rights of Minority Stockholders.....	854
Metric System Again.....	854
What Are the Intolerable Conditions in the Anthracite Country..... <i>R. W. Raymond</i>	855
Columbia's Greeting to California.....	856
*The Copper Region of Northern California. <i>J. S. Diller.</i>	857
A New Alabama Blast Furnace.....	858
Production of Graphite in 1901.....	858
American Section of the International Association for Testing Materials.....	859
The Ontario Government Assay Office.....	859
*The New Oil Gushers at Jennings, La.....	860
Locating Coal Lands in Canada.....	860
Geological Relations and Age of the St. Joseph and Po- tosi Limestones, Mo..... <i>Frank L. Nason.</i>	861
Arsenic and Lead Mines in the Pyrenees.....	861
*Steel Head-Frame of the Parrot Mine, Butte, Mont.....	862
Speculator Mine, Butte, Mont.....	862
Notes on the Geology of Panama..... <i>Henry W. Edwards.</i>	862
Production of Barytes in 1901.....	863
Recent Decisions.....	863
Abstracts of Official Reports.....	864
Books Received.....	865
Books Reviewed.....	865
Correspondence.....	865
Questions and Answers.....	866
*The Lampert Concentrating Table.....	867
*The Weinland Water-Power Tube Cleaner.....	867
*Patents.....	867

*Illustrated.

DEPARTMENTS.

Assessments.....	882
Chemicals, New York and Foreign.....	880
Coins, Foreign.....	881
Dividends.....	882
Financial Notes.....	881
Industrial Notes.....	870
Markets: Coal, United States and Foreign.....	878
Iron and Steel.....	879
Metals: Gold, Silver, Copper, Tin, Lead, Spelter, Anti- mony, Platinum, Quicksilver, etc.....	880, 881
Minerals, New York and Foreign.....	880
Mining News: United States and Foreign.....	870
Mining Stocks.....	877
Obituary.....	869
Personal.....	869
Prices Current: Chemicals and Minerals.....	884
Schools, Technical.....	864
Societies.....	869
Stock Market Review: United States and Foreign.....	877
Stock Quotations.....	882, 883
Trade Catalogues.....	870

A SIGNIFICANT report is that the contractors who will operate the Rapid Transit line in New York City are considering the question of using fuel oil in the power plants which are to be built for that line. Texas oil can be brought to New York by water at very small cost; and if a supply can be assured at prices somewhat lower than the equivalent quantity of coal, there is no reason why oil should not have the preference. If its use should be adopted in this case, others may follow.



OUR AIM is to publish news in the columns of the ENGINEERING AND MINING JOURNAL. The mistake of a "make-up man" in our last week's issue made it appear that we had furnished a statement of the mineral production of Great Britain for the year "1061" which, if correct, would not be news, but rather ancient history. Our readers will please consider the date line in question reversed, and read it "1901." Probably most of them have already done so; but we make this note to put ourselves right on the record.



A SPECIAL CORRESPONDENT of THE ENGINEERING AND MINING JOURNAL has recently visited the newly developed oil territory at Jennings, La. His report, while brief, contains a good deal of interesting information and is published in another column. One remarkable and encouraging feature is that although one of the new wells came in on May 21 by spouting a 6-inch stream 175 feet high, there has been no "boom" or wild speculation. The territory is reported to be in the hands of strong companies who will develop it in a rational, business-like manner.



FROM TIME to time there is an attempt to boom Western Kansas as a possible gold mining country. We have several times given the reasons why the probabilities are entirely against the finding of gold in paying quantities in that region. The former efforts to boom the country have fortunately been failures; but that does not seem to deter others from making the attempt. The latest story sent out to the press reports the discovery of shale deposits "assaying \$18 gold to the ton." Like previous information from the same region, this report cannot be traced to any responsible source, and we doubt if it has any real foundation.



THE TERMS of the peace in South Africa do not seem to suit everybody, though to most people they seem fair enough. Already some of the London papers which are generally understood to represent the views of the large mine owners are objecting to the agreement that no tax on land shall be imposed. According to this, they say, whatever part of the cost of the war and of reorganization the Transvaal and the Orange River Colony may be called upon to pay hereafter must be met by the mines and not by the Boer farmers who carried on the war. This is probably true; but after all it is the mines which expect to benefit by the change of Government. Moreover, it seems to be the common sense view that the Boer farmer will not be able to pay any tax

on their lands for some time to come; while any such would discourage the agricultural immigration which is so desirable from a British point of view.

The question of taxation is going to be a difficult one, but it seems to be an unavoidable conclusion that, whatever its amount, the bulk of it will fall upon the mining companies. Already it is reported that the tax on net receipts which was formerly 5 per cent is to be doubled in amount. Doubtless more will be heard from the mine owners on this point.



OUR LONDON correspondent again refers this week to the troubles of the stockholders in the Le Roi Company. We had hoped that with the passing of the mine from the control of Whitaker Wright, a fair opportunity would be given for the management and operation of the mine on business principles. The influence of the London Stock Exchange seems still strong, however, and the affairs of the company are still in a discouraging condition. The confidence in the mine and in its ultimate success under proper management, which is expressed in Rosslund, and in British Columbia generally, does not appear to have reached the London stockholders, who still seem to look rather to the Exchange than to the mine itself. We are inclined to the local feeling, and we hope that the Le Roi Company may be freed from the present complications, and that the mine may pass into the hands of those who are able to show its real value.



INDICATIONS MULTIPLY that among the rank and file of the United Mine Workers in the Pennsylvania anthracite fields, particularly those of foreign birth, the strike, precipitated by some very disreputable wire pulling against the real wishes of a majority of the miners, is beginning to lose strength. Matters are approaching a point where the district leaders who brought on the strike will have trouble in holding the men back. Intimidation, open or secret, continues, and the families or relatives of men still working about the mines are subject to all manner of petty persecution.

When the strike was ordered a feeling prevailed in labor union circles that the operators could be compelled to capitulate if the firemen, pumpmen and engineers were called out. This hope has proved vain. A sympathetic strike in Virginia and West Virginia, intended to restrict the amount of soft coal shipped to seaboard points and cause loss and inconvenience to the public, is proving abortive. Finding that they are losing strength, officials of the United Mine Workers now threaten to restrict shipments from the Central Pennsylvania bituminous fields, and hint at calling out all members of the union in Pennsylvania, Indiana and Illinois. Such desperate action, however, is unlikely. It is no secret that many bituminous operators are dissatisfied at the results of union recognition and a system of yearly wage agreements that leaves many points unsettled over which local lodges make endless bother. Such operators would be glad to see the union go back on its contracts, thus enabling them to refuse it recognition thereafter. It is scarcely probable that the leaders of the United Mine Workers will sacrifice all public sympathy and jeopardize their organization.

The anthracite operators, meanwhile, are acting purely on the defensive, but various things indicate that by July 1, or shortly after, there will be a change of policy. The operators having found out that a large proportion of their employees, tired of an unpopular strike, are willing to work if protection is guaranteed, may undertake to start a number of collieries. Should such action lead to rioting and the calling out of the militia, the end of the strike would be near.



MARKET CONDITIONS

Iron and Steel.—There is very little new to record of the market this week. Almost the only change is an increasing disposition to make contracts for material to be delivered in the first half of 1903. Hesitation to close engagements seems to be giving way, though in other quarters there is a tendency to be conservative about arrangements for next year. Meantime there is still some urgency for early deliveries, and some payment of higher prices, in the form of premiums, when pressing orders can be placed. The largest business reported just now in pig iron is from the Southern furnaces, which are beginning to take contracts for foundry and basic pig for next year.

There is more ordering of foreign material, chiefly German. The contracts placed for pig iron and steel billets must have reached a large total. This will serve to relieve some of the pressure upon our furnaces and mills.

Copper.—The copper market is quiet, with little new business and no material change in prices. Most producers are well sold up, and consumption is very large, as all manufacturers are exceedingly busy. In London the market has been rather flat, and standard copper is lower. Refined copper is steady, however, and standard is merely approaching more nearly the normal difference between that grade and electrolytic.

Copper production, as reported by Mr. John Stanton, who acts as statistician for the companies, showed an increase in May which was larger even than we had anticipated. The total output from the United States mines for the month was 25,763 tons, of which 21,763 tons came from the reporting mines, and 4,000 tons from the outside sources—that is, from the smaller mines and from the smelters who treat ores carrying copper with other metals. The total shows an increase of 3,371 tons, or 15.1 per cent, over May, 1901. This gain, which indicates that the mines are now, as a rule, working very actively, was large enough to do much more than offset the decreases shown in the earlier months of the year. The total output for the five months to the end of May was 113,708 long tons, being greater than that for the corresponding period of last year by 2,715 tons, or 2.4 per cent. The indications are that June will show another large gain. The foreign reporting mines—including all the principal European mines—also show a large increase in output, their total for the five months having been 44,344 long tons, a figure which exceeds that of last year by 6,019 tons, or 15.7 per cent. Notwithstanding this greater production abroad the exports from the United States continue large. Although they were 3,814 tons less than the high level reached in March, they were only 141 tons less than in April; while the total for the five months was 83,439 tons, which is considerably more than twice the quantity—38,185 tons—reported last year. Up to the end of May this year we exported 73.8 per cent of our total production, against 33.5 per cent in the corresponding period last year.

Other Metals.—Tin continues in demand at lower prices. The question of future supplies of this metal is not solved by any means.

Lead is in about the average demand, at unchanged prices. Consumption has been good this year.

Spelter is still somewhat excited, and the quotations show little change. There is a very good demand.

Silver continues to hold its own in demand and quotations, and even to show some improvement. Indian orders in London have been fair.

Coal.—We have again to characterize the Western coal market as depending chiefly upon transportation. The railroads continue to promise much and perform little all through Ohio, Indiana and Illinois; in Western Pennsylvania conditions are a little better. The Lake trade suffers from delays in the delivery of coal at the ports, as it has ever since navigation opened. Complaints from coal operators about existing conditions are very general.

The apprehension that the bituminous miners would strike in order to aid their brethren in the anthracite country seems to be passing. The Western miners are generally disposed, from all accounts, to adhere to their contracts, and to continue at work. The strike in West Virginia seems to be a failure, and miners are resuming work. It is somewhat singular that this should be the case, since the miners in this district undoubtedly have more real grievances than those of any other section in the country. The latest news is that a general convention of miners has been called to consider the strike question.

The seaboard bituminous trade continues to be affected by the unusual demand for steam coal in the large cities where anthracite is difficult to obtain. This has affected prices, and also, to some extent, deliveries to regular customers.

The anthracite market does not exist for the time. Everything depends on the strike, which is fully discussed in another column.



RIGHTS OF MINORITY STOCKHOLDERS.

The Court of Chancery of New Jersey has made permanent the temporary injunction restraining the United States Steel Corporation from issuing its \$200,000,000 new bonds to be exchanged for an equal amount of preferred stock. The injunction does not apply to the remaining \$50,000,000 bonds which are to be used for improvements and to supply working capital. The decision is final so far as the Court of Chancery is concerned, but an appeal has been taken by the Steel Corporation to the Court of Errors and Appeals, and an early hearing in the case is probable.

The injunction in question is issued on the suit of a stockholder who did not vote in favor of the new issue of bonds, and is granted in full view of the fact that the execution of the mortgage and the exchange of bonds for preferred stock was approved by vote of a majority of the stockholders. It will be remembered that the issue of bonds in exchange for preferred stock was specially authorized by an amendment to the New Jersey corporation law—known as the Reed Act—which was passed in March last.

The Vice-Chancellor in his decision holds in effect that the constitutionality of this amendment is not now in question, and therefore does not pass upon it. The preferred stock of the Steel Corporation was issued prior to the passage of the amendment, and has therefore certain vested rights of which it could not be deprived by changes in the law. Among these is the right to participate in any distribution of assets by the corporation; and the court holds that "this conversation of stock into bonds secured by

mortgage is in form and substance distribution to the stockholders of assets available for that purpose, and the transaction, as disclosed in the present plan, is a discharge of the company's obligation to the stockholder and not a purchase of his stock for retirement or for any other purpose. Such conversion is, therefore, without authority, unless expressly authorized by law."

Consequently such an issue of bonds or distribution of assets must be made to all the preferred stockholders in proportion to their holdings; and the issue of bonds to some stockholders and not to others is a preferential distribution and in contravention of the rights of those who do not receive a share of the issue.

The court does not pass upon the business view of the issue, which is a question of policy and management, but only on the purely legal questions involved. On these the decision is made and the issue or exchange of the mortgage bonds for preferred stock is held to be clearly illegal.

We have heretofore expressed our opinion as to the policy of the proposed issue of bonds. We have only to repeat that we do not believe it good business for a manufacturing corporation to increase its mortgage debt and substitute fixed charges for dividends, the payment of which can be postponed if necessary without impairing its credit.

After all, the interesting point in the present decision is the disposition shown by the New Jersey court to protect the minority stockholders. Under present methods of corporation management the rights of such holders are apt to receive very small consideration; and it is well that the courts and the law should intervene occasionally to remind corporations that stock majorities are not always infallible or all-powerful. The methods adopted by the United States Steel Corporation have been generally fair and creditable, and we have had occasion to comment on them favorably. In the present case, however, the court seems to have followed the law and stated it clearly.



THE METRIC SYSTEM AGAIN.

In another column we give a rejoinder from "J. B. R." to our editorial comments on his letter on the metric system, which was published in our issue of April 26. In doing so we have to apologize for several weeks' delay, which has been caused by the pressure of other matters upon our columns. We cannot, however, apologize for what our correspondent courteously intimates was a misconception of his argument. The points which we sought to meet as well as possible were all clearly raised in his letter in one form or another, as we think most readers will admit.

We must admit that "J. B. R." has presented the arguments against the adoption of the metric system about as forcibly as possible. When he says 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," we have to admit the truth of what he says—with the exception of the last clause, wherein our view is radically different from his. The cost of a change certainly increases with our advance in knowledge, in industrial capital and in complexity of manufactures and commercial dealings. It will be greater ten or twenty years hence than at the present time; and that is one reason why we urge that the change ought to be made now rather than put off to some indefinite future time. It will be put off if we stop to figure out the possible or probable cost of every item; and then the argument and the figuring will all have to be done over again

by-and-by, when the cost and the difficulty will be greater. For the question will not be settled by a postponement, and the demand for the change will be emphasized as our foreign trade and our intercourse with foreign nations increases.

This we believe, for as we have already said, we differ from our correspondent, and hold that the price to be paid for the change to the metric standard is not too high. We believe that the advantages gained by the adoption of rational standards, both in our foreign trade and in simplifying our work at home, will be far greater than the expense in money and the temporary inconveniences. Moreover, as was said in our former article, the actual cost, while any approximation to the total looks large, will be borne by a very large number of people and manufacturing establishments, so that it will be comparatively moderate in all cases. We do not see that one-third of our manufacturers will be "seriously injured," as is said in the resolutions of the National Association of Manufacturers, quoted by our correspondent. On the contrary, we believe that they will in the end be materially benefited, and that they will in time fully recognize the fact. There is always a certain proportion of people who cannot bear to give up old ways, and who have to be in a measure forced to do it. Yet most of these people, after their first strenuous objections to the compulsion are past, will no more go back to their former conditions than they would voluntarily have left them. This will be the case with the proposed reform.

We do not propose to take up again the case of personal inconvenience in learning the new measures, which has already been argued. Of course we admit the claim of "J. B. R." that the more a man knows the more he has to learn. The laborer who has to know only two or three measures, of course learns them more quickly and remembers them more easily than the skilled worker, the engineer or the man of science, who have to use many measures. But the latter classes bring acuter intelligence and better trained memories to bear on the problem.

One point—which is not new—we may mention briefly. Any intelligent man can learn in a day the relation of measures of length, surface, capacity and weight in the metric system. But if we take to-day, say a thousand intelligent men—mechanics, merchants, manufacturers and the like—how many can tell off-hand the number of cubic inches in a standard gallon, for instance; the proper size of a bushel measure; the difference between a pound troy and pound avoirdupois; or even all the subdivisions of those weights and measures? The proportion would be very small; and this simply because the relations are wholly arbitrary and have no reason or connection to hold them in the memory.

We do not know just what "J. B. R." means by saying that standards arrived at "laboriously" are far more important than the way in which we measure them. A standard must be expressed in dimensions to be intelligible, and all standards are so expressed. In most cases our standard sizes have been placed at even measures—as 1 inch, 2 inches or the like—not because there was any occult virtue in those special sizes, but because they came near what was wanted, and were "even measures" and easy to remember. It would not be necessary to alter all such standards in common use at once, and the use of the equivalent metric measures would involve no more inconvenience than the memorizing of two figures instead of one. In fact, in many cases there would be less trouble, especially in the case of pipe-fittings and some other things where the actual dimensions must be given, not in even inches, but in sixteenths and thirty-seconds. A notable instance is found in the sheet and wire gauges, which are much better expressed and more

easily remembered in metric language than in our clumsy fractions of an inch. Any one who has had to figure much over brass sheets or copper wires will appreciate this.

Perhaps the greatest difficulty of this kind would be found in the standard screw-threads which are now in general use. Even here, however, we do not believe that there are any insurmountable difficulties in the way of expressing these standards in metric measures without any change in the actual sizes or in the tools used to cut and measure the threads.

As to the question of authority for and against the change, we think the weight is decidedly in its favor. We admit the eminence of Mr. Sellers as a mechanic and manufacturer; but when he says that "the passage of the bill making the metric system compulsory after a certain date in all the bureaus of the Government, would render valueless every plan in the Navy Department, would make it impossible to repair the engines of any ship"—he is simply talking nonsense in big words. Any one of his own draftsmen who could not tell him something better than that would stand a very good chance of an early discharge for incompetency. To the opinions of Mr. Westinghouse, we would attach far more importance, but we think he overrates the time required for people to learn a new system.

The quotation given from the *New York Times* in closing amounts really to nothing. It is absurd to say that "no legislation is needed." Of course every man is at liberty to use any measure he likes, as long as it affects himself alone; but weights and measures which affect almost every commercial transaction, which are liable to appear in lawsuits and which are in use in public as well as private transactions, must have some established legal standard. They are public property and must be established by law.

To sum up briefly, we believe that the opposition to the pending bill is chiefly that dead weight of conservatism which opposes every change. This is, fortunately, less in the United States than in any other country. We do not mean by this to characterize "J. B. R." as a "dead weight"; but we think he has allowed himself to be influenced too much by the arguments which the conservative advance, and that he has over-estimated the cost of progress.



WHAT ARE THE "INTOLERABLE CONDITIONS" IN THE ANTHRACITE REGION.

Mr. John Mitchell is fond of repeating that the anthracite mine-workers whom he professes to lead and control have entered upon their campaign for the paralysis of industry and the destruction of property as a revolt against "intolerable" conditions. We are expected to infer that something in the treatment or payment of the anthracite miners was so unjust and outrageous that it could not be endured a day longer, but must be forcibly terminated at once, at whatever cost to individual liberty, public order, and hundreds of industries and communities not in any way guilty of the alleged wrong.

But why did Mr. Mitchell, until overruled by a tumultuous opposition, advise that the "intolerable" conditions, to which he now vaguely refers, should be endured? And why did he say that a "small concession" on the part of the operators would have been acceptable, and that his Union had purposely asked more than it expected to get in order to have room for "negotiations"? If the situation was not absolutely intolerable when Mr. Mitchell considered any little concession as desirable and probably sufficient, and opposed a strike with all his might, what

has made it intolerable since? That it is so to-day, in more respects than one, no one will deny; and since Mr. Mitchell, otherwise so ready to talk, seems to be disinclined to explain in detail his favorite adjective, I will do so for him, by stating the things that are "intolerable" at this time in the region over which he rules.

1. *Terrorism* is intolerable. This factor began its work before the Hazleton convention. Terrorized miners absented themselves from that convention, or abstained from resisting its headlong course. Terrorized shopkeepers are giving credit to irresponsible strikers. Terrorized women and children are daily persuading husbands and fathers to surrender to the mob, in order that their homes and families may be spared from insult, violence and murder. Terrorized town-officers are winking at lawless outrage. Terrorized school-trustees are permitting young women who are teachers in the public schools to be persecuted because they have relations who still earnestly desire, and feebly endeavor, to exercise the rights of freemen. Terrorized politicians are devising ways of conciliation and compromise with disorder. Terrorized citizens are submitting for a brief period of bewilderment—not, I believe, forever—to the silent and passive encouragement of wrong, under the threats of the boycott. And, finally, these things are practically encouraged by those who have not the excuse of fear, but are either seekers for temporary popularity, or superficial students of "social reform." Indeed, Mr. Mitchell, all this is intolerable; and the world is indebted to those who are now on strike against it.

2. *Shirking* is intolerable. Industrial work can be thoroughly done only when the employee is either the slave of his employer, or a free man, capable of making, and responsible for keeping, a contract with his employer.

The first condition has been tried and found wanting in this country. Apart from all moral considerations, slavery is unanimously admitted to be a bad system, economically; and it would still be so if the slave were held in bondage with his own consent.

The second is the system of contract, under which the individual makes and keeps his own agreement. It is perfectly consistent with this system that individuals should form associations, and deal through these with other individuals or associations, provided there be, somewhere, a legal responsibility for promises made.

But there is a *tertium quid*, hotly recommended by shrewd interested and silly disinterested parties, under which the employee is the slave, not of the employer, but of a third party, namely an unincorporated "organization," which makes and breaks promises for him, and forbids him to seek special advantage by private agreement, based upon his personal ability to do better work, or equally good work at a lower price, than others. He is not altogether a willing slave; in many cases he can refuse to wear the badge of servitude only by risking his livelihood and the peace and comfort of his family. And his organized master is incapable of making a legally binding contract, either with him or his employer.

Of all conceivable systems of industry, this is the worst. And one of its worst features is its deliberate denial of any obligation towards the employer, as regards the efficiency of the employee.

It has been my chief occupation for thirty-five years to promote, both in professional practice and through technical literature, the improvement, in

economy and in safety, of American methods of mining; and I have yet to hear of the first instance in which a Miners' Union has not opposed such an improvement, or in which such a Union has given the slightest attention to the instruction of its own members in their professed business. Their "lecturers" lecture on strikes and boycotts, not on drilling and stoping; and their one eternal theme and purpose is, how to get more and give less for it. They prohibit the training of apprentices; they fight trade-schools; they oppose benefit-funds and reading rooms because, as one of their members once frankly said to me, "such things tend to make workmen contented, and disinclined to strike—and that is what we do not want!"; and they maintain throughout the notion that, as between "labor" and "capital," the period of a strike is war, justifying all the ethics of war, while the period of peace is simply an armed truce, during which preparation is to be made for another war.

What wonder that, in those mining camps in which such unions are absolutely dominant, mining practice is conspicuously bad? What wonder that, in British Columbia, the largest mines of the Rossland District were closed, not on account of the "eight-hour day," but because it was impossible to get an honest day's work of no matter how few hours? What wonder that, in the anthracite regions, since the "concession" of 1900, the average day's work of a man (then already small enough, as all mining engineers know) has been still further reduced by 12 per cent? During this period of "peace," over 100 strikes (which Mr. Mitchell is understood to say he had no right to prevent, because they were "local") have emphasized the fact that no workman—not even a breaker-boy—could be discharged for inefficiency or disobedience of orders without incurring the instant wrath of "organized labor." The reply, made to a distasteful order:—"Go to ———; you ain't my boss; John Mitchell, of Indianapolis, is my boss!" is not an imagined, but an actual one; and it represents the general situation very fairly.

Yes, Mr. Mitchell, this is "intolerable"!

3. *Hypocrisy* is intolerable. The deliberate attempt to prevent the simple protection of property against fire and flood, and the brazen appeal to persons not members of the Mine Workers' Union to betray their trusts, and abandon the interests in their charge; the threat of coercing the innocent public into an alliance with lawlessness by depriving it of any other fuel than that which mobs will not permit to be mined;—these things agree but poorly with the disapproval of disorder and outrage professed by the men who practically invited such results. The tardy arrival of Union officials, to persuade a mob "not to do so any more, this time"; the pretence that assassins are going to be rigorously hunted up, or down; in short, all the highly decorous protests of the ringleaders of the trouble (including the chief who tried to prevent it, but couldn't) are somewhat nauseating to those who remember how the "Mollie Maguires" maintained a similar bureau of condemnation for crime, until the gallows put an end to their interviews and speeches and proclamations. When a criminal has once been caught, through the efforts of the Union, expelled from their ranks for his crime, and thereafter blacklisted, as people are who have committed no crime, it will be time to recognize the good faith—as distinguished from good policy—of the love of order now so prominently paraded. When that time comes, Mr. Mitchell, you will not find it necessary to denounce the presence of policemen, simply guarding life and property against the crime which you sincerely detest; for they will be your allies.

Another piece of intolerable hypocrisy is the talk

about "the eight-hour day," as a pretext for the original strike, and for several high-handed orders, since issued to members and non-members of the Union alike. The transparent and audacious humbug of this pretense requires for exposure a separate article.

4. Reckless and unnecessary destruction of the resources of the United States is intolerable. I do not refer here to the wanton injury of collieries by depriving them of protection from flood and fire, which I have already mentioned, but to the irrevocable waste of coal in mining, which capitalists and engineers have been for many years striving to diminish. To this endeavor, the chief obstacle is the attitude and the demands of the Miners' Unions, both East and West. But this subject also requires a separate treatment; and I pass it here with a single observation, namely:

Mr. Mitchell and his organization are now engaged in inflicting temporarily upon the citizens of New York and other Atlantic cities what they would have to endure permanently if bituminous coal were their only available fuel, or if the supply of anthracite were so far impaired as to make it economically unavailable for manufacturing purposes, in competition with bituminous coal. Now, the day when this condition must arrive will be hastened by the waste, and postponed by the saving, attendant upon the mining of anthracite. If "organized labor" insists upon methods which waste that precious and limited supply, it is striking a blow at the comfort and prosperity of our great Eastern cities, which their inhabitants ought to condemn and resist. This, I undertake to say, it is now doing.

5. The list of intolerable conditions might be further extended; but I will mention only one more to-day. Mr. John Mitchell, I am sorry to say that you are yourself rapidly becoming intolerable. It is a pity; for you were born for better things. But you were neither good enough nor bad enough to be a dictator; you know too much, and too little, to direct a movement which you did not and do not approve, and which you now think, as you thought when it began, will not succeed. You are forced, step by step, to measures which you did not anticipate, and do not like. Your followers do not trust you, and will be very likely to turn and rend you, after they have crowded you to defeat. Potent to initiate mischief, but impotent to stop it, you are already reduced to the function of issuing optimistic bulletins, "while you wait." Such a futile figure-head cannot long be recognized as a dictator. Mr. Nichols, of Scranton, may get out of this strike the object for which he is reported to have precipitated it against your protest, namely, his re-election in July as the President of his district. Possibly one or two other local leaders may secure the satisfaction of their local ambitions. For these men can claim the credit of the attack for themselves, and lay the blame of defeat upon you, as their half-hearted and incompetent leader. It will not do, Mr. Mitchell, to be simply *tolerable*.

R. W. RAYMOND.



COLUMBIA'S GREETING TO CALIFORNIA.

Of the honorary degrees conferred last week by Columbia University, perhaps the most significant was the degree of Doctor of Science, given to Prof. S. B. Christy, of the University of California, which was the well-deserved recognition, not only of an eminent scientific investigator and instructor, but also of a great school, in the development of which he had borne a leading part, and of which he was the fitting representative. This double ground for such a distinction was felicitously stated by Prof.

H. S. Munroe, who presented Prof. Christy as a candidate for the degree, in the following address:

"Mr. President: I have the honor to introduce as a candidate for the honorary degree of doctor of science Prof. Samuel Benedict Christy, professor of mining and metallurgy, and Dean of the faculty of the College of Mining of the University of California.

"Professor Christy, you have now been connected with the University of California for over thirty years, as student, as assistant, as instructor, and as professor. During this period you have distinguished yourself, not only as an educator, but in addition to the very onerous and exacting duties of your professional work, you have conducted elaborate investigations in chemical geology and chemical physics in connection with your studies of the origin of metalliferous deposits and in your researches into the fundamental laws governing certain metallurgical operations.

"As a result of this work, you are recognized as a scientific student of distinguished ability, not only by your colleagues on the Pacific Coast, but here and on the other side of the Atlantic, and, indeed throughout the world, wherever like problems demand solution.

"We honor you to-day, not alone for these scientific achievements, but above all for your earnest efforts for the sound education of the young engineers committed to your charge. You have now been responsible for the development and conduct of the College of Mining of the University of California for over two decades. In this work you have succeeded, where able men have failed, and from small beginnings, from a school with less than a score of students, the College of Mining, under your care and guidance, has grown to be one of the largest and most flourishing institutions of the kind in the world. In this work you have enlisted the hearty support of the mining men of California; they have cordially seconded your efforts, and opened their mines and metallurgical works to you and to your students; they have showed their confidence in you by sending their sons to your institution, in ever-increasing numbers, to be trained by you for their life work. The State authorities have again and again increased your equipment and facilities for instruction, and now by private munificence, the foundations are being laid for an imposing structure, to be committed to your care, and devoted solely to instruction in mining and metallurgy.

"As a result of your efforts, we of the old Columbia School of Mines recognize your College of Mining as our most formidable competitor.

"There is, however, no real competition or rivalry, and certainly no jealousy, between us. We are working for a common object, and there is room for both institutions and for many more in this imperial land of ours. As colleagues, then, we greet you, and congratulate you on your well-deserved success, and we feel that we do ourselves honor in honoring you."

These words do not overestimate the merits of him to whom they were addressed. Great investigators are not always great teachers; the best teachers are not always,—indeed, not often,—skillful administrators; admirable administrators may, and often do, fail to impress upon legislators or individual citizens such a sense of the excellence and the usefulness of their work as to secure the support without which personal genius and enthusiasm cannot accomplish great public results. It is given to few both to plant the seed and reap the harvest; to labor upon both the foundation and the superstructure. We will not in this instance say, to lay both the cornerstone and the top-stone; since we should thus ignore both history and prophecy. For the cornerstone of the scientific department of the University of California was laid before Prof. Christy became a student there; and the top-stone has not yet been, nor is it likely soon to be laid. After all, such an institution is rather a giant tree than a building; and where its summit shall be no human architect can prescribe.

It is enough to say of Prof. Christy—what can be truthfully said of few—that by a rare combination of knowledge, enthusiasm, wisdom, patience and power, he has won the right to stand as a representative of a group of colleagues, who have created and progressively extended a magnificent institution, repeating upon the far Pacific shore the work inaugurated by Eggleston here.

Columbia's graceful greeting to California could have taken no more appropriate form than the doctor's hood, which one of the oldest placed upon the head of this son of one of the youngest, of American universities.

THE COPPER REGION OF NORTHERN CALIFORNIA.*

By J. S. DILLER.

Within the last five years northern California has taken rank among the great copper-producing regions of the United States. In 1900 it stood fourth in the series, having produced over 1,400 tons, with Montana, Lake Superior and Arizona, respectively, still far in the lead. The output is rapidly increasing, and bids fair to continue to do so with the operating of other mines and the erection of smelters now contemplated.

The copper region lies in Shasta County, among the hills about the northern end of the Sacramento Valley, and is largely embraced in the Redding quadrangle, of which the United States Geological Survey has now ready for distribution a contoured topographic map on the scale of about 2 miles to 1 inch. Upon the completion of the topographic map the writer spent two months (August and September, 1901), making a general geological study of the copper region in the preparation of a geologic map for folio publication. The work will be completed next summer, but in the meantime, on account of the great geological interest in the region and its economic importance, coupled with the fact that comparatively little has been written concerning¹ it, a preliminary note may not be out of place.

The copper region contains an extensive series of sedimentary rocks², ranging from the Miocene into the Devonian, associated with igneous masses of various ages and kinds which have intercalated or intruded the sedimentaries. A number of mountain-building epochs are recorded by breaks already recognized in the stratigraphic and faunal succession, and others will doubtless be discovered in the detailed survey. The general abundance of fossils in the Cretaceous, Jurassic, Triassic, Carboniferous and Devonian sediments is such as to render it possible to work out the structure in detail with a much higher degree of probability than is usually the case.

The ore deposits of the copper region may be conveniently considered in three groups—auriferous quartz veins, sulphides in contact zones, and sulphides in shear zones.

AURIFEROUS QUARTZ VEINS.

Auriferous quartz veins are most abundant in the western part of the copper region about Quartz Hill and Old Diggings, a few miles north of Redding, where, although, the ores are generally too low grade to pay for milling, they may be smelted with the copper sulphides at a profit. The copper industry has thus invigorated the gold mining, which in the early placer days was the greater resource of the region.

The quartz veins have a wide range in size and position. In the National Mine a 3-foot vein strikes N. 25° W., dipping 45° to the southwest. The Texas shows a nearly vertical vein, sometimes over 5 feet thick, with strike nearly north and south; while at Quartz Hill the 40-foot vein strikes N. 45° E., and dips 70° to the southeast. Further study may result in separating these veins into groups of different ages. They all contain some auriferous pyrite or native gold, and often chalcopyrite, but the vein matter is in most cases almost wholly quartz. Within the copper region nearly a dozen mines in this sort of deposit are active, and yet the output is comparatively small.

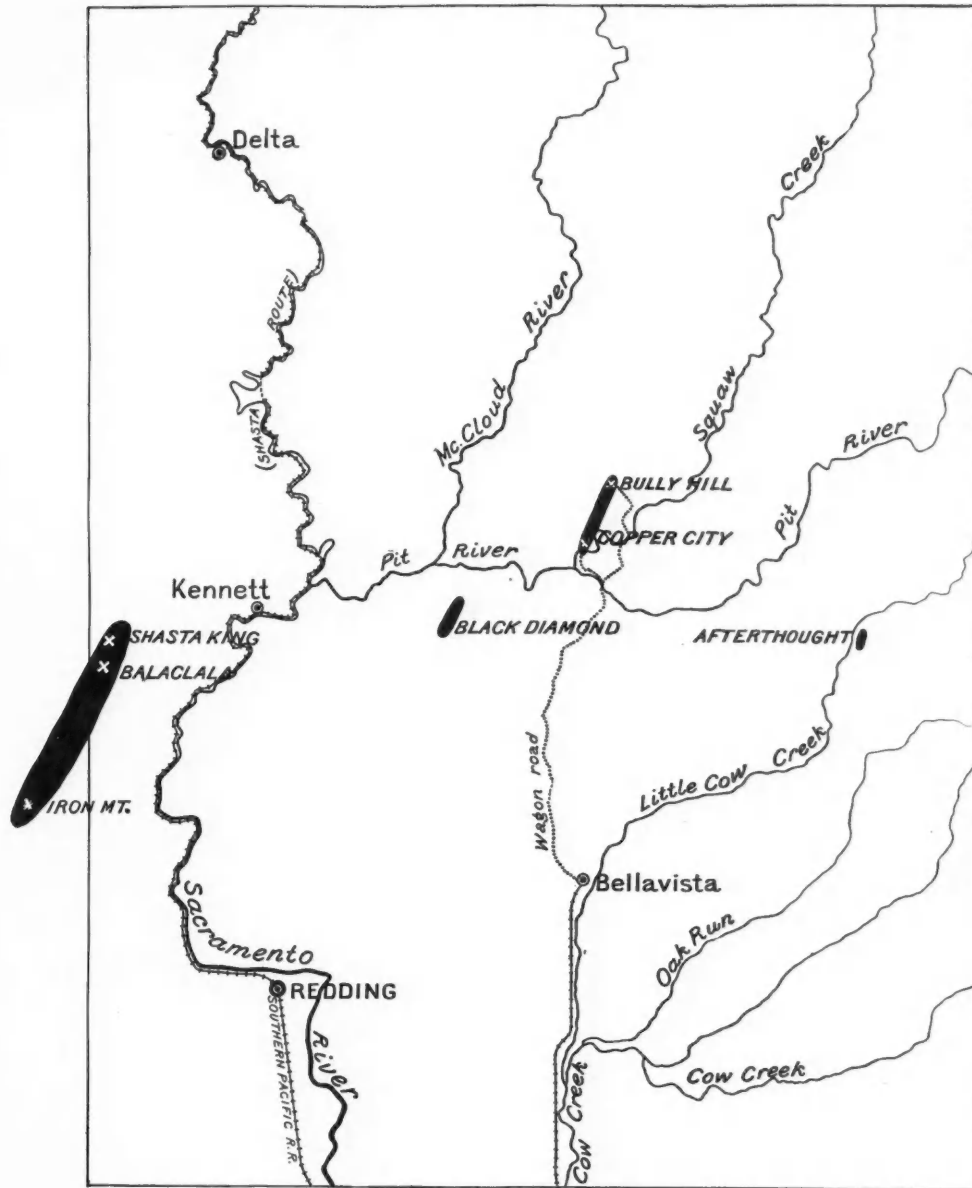
SULPHIDE DEPOSITS IN CONTACT ZONES.

The Black Diamond Mine, near Bayha, about 20 miles northeast of Redding, is an interesting example of this type. Under the management of C. Dopplestein a small but well equipped force is at work developing. At the Rudolph opening slaty shales occur dipping easterly apparently beneath the carboniferous limestone which forms the crest of the ridge. Small masses of pyrrhotite and chalcopyrite occur, also pyrite and magnetite, with limonite and other

secondary minerals. The ore is associated with coarsely crystalline fibrous diopside³ and garnet, whose relations are not so easily perceived under ground, but upon the surface are illustrated at many points in the neighborhood along the contacts of diabase dikes which cut the carboniferous limestone. The Black Diamond Mine embraces many tunnels and open cuts on both sides of the hill of carboniferous limestone, and most of them show the effects of contact metamorphism. The best exposures are upon the crest of the limestone ridge, where it is cross-cut by a number of diabase dikes running east and west and ranging from 5 to 100 feet in width. Along the edges of these dikes, in contact with the limestone at many points, pits have been dug into the iron-stained fibrous masses of diopside, mixed occasionally

extends northeast through the copper region of Shasta County, from near Iron Mountain to beyond Bully Hill, and traverses a series of fossiliferous sedimentary rocks ranging from the Devonian up into the Mesozoic, at least as far as to near the top of the Triassic. A large portion of this mass is volcanic, embracing acid and basic lavas with fossiliferous tuffs, which show that a portion of the series, and possibly the whole, is of Triassic age.

The igneous rocks and associated sedimentaries have been greatly compressed, folded, faulted and sheared. The shear zones in some cases have been mineralized, developing in spots by replacement irregular bodies of sulphide ore, ranging in size from a mere film or nodule to masses many hundreds of feet in greatest dimension. Deposits of this sort



MAP SHOWING COPPER DEPOSITS, SHASTA COUNTY, CAL.

with garnet, serpentine and traces of ores. The fibres of diopside, several inches in length, are perpendicular to the contact and are conspicuous. The Roseman group of mines are nearby upon the same dikes. All the openings and tunnels of the Roseman and Black Diamond mines were not examined, but as far as seen the small ore bodies of sulphides and magnetite were always associated with diopside in contact zones. The dike rock in question, here designated diabase, is composed largely of calcic feldspar, which generally has the ophitic arrangement characteristic of diabase enclosing chlorite, epidote, magnetite and quartz from the altered feldspar and pyroxenes. The amount of quartz varies, and in some cases seems a primary constituent.

SULPHIDE DEPOSITS IN SHEAR ZONES.

A wide and very irregular belt of igneous rocks

³This mineral becomes magnetic when heated and may contain enough of iron to place it with hedenbergite.

are the only ones which have been successfully mined.

The ore bodies thus far exploited have generally been found in igneous rocks (keratophyr, closely related to quartz porphyry), although, in some cases, within a short distance of sediments. The sheared keratophyr in many cases resembles shale, and is so called by the miners, but a microscopic examination readily distinguished it from the sedimentary rocks which generally contain microscopic fossils, such as radiolaria, sponge spicules and other siliceous organisms.

All of the copper produced in the region under consideration comes from two districts—Iron Mountain and Bully Hill—and these deserve special mention.

Bully Hill District.—The Bully Hill District, including also Copper City, has been developed within the last few years under the efficient management of Mr. A. H. Brown. The arrangements for mining

* Paper read before the Geological Society of Washington. ¹ENGINEERING AND MINING JOURNAL, April 15 and 22, and May 13, 1899, by H. Lang. ²Science, March 14, 1902, F. M. Anderson. ³"Metamorphic series of Shasta County," by James Perrin Smith, *Journal of Geology*, Vol. II., p. 288.

and handling the ore to the roasting bins, furnace and converters are excellent. Two converters were in operation last July, yielding about 16 tons of copper daily, and one or more converters have been added since, indicating a good outlook.

In Bully Hill there are a number of zones containing ore. Only two zones are of importance—one in quartz porphyry (Bully Hill quartzite), and the other in a highly altered keratophyr. Although the main ore body in places appears to come in contact with the quartz porphyry, it is most intimately associated with a keratophyr, which contains much less silica and more lime. The ore bodies mined were nowhere seen in the Triassic shales, but such shales with radiolaria occur in the tunnels a short distance to the eastward of the main lode. The general strike of the shear zones in which the ore bodies occur is from nearly N. to N. 10° E., with steep dip to the westward. The ore bodies are flattish, lenticular of irregular outline, and range in size from mere nodules to bodies hundreds of feet in length. The ore was seen from 4 to 12 feet in thickness, and the walls are often but not always well marked. Generally on the foot-wall there is a white selvage, which, according to Mr. Geo. Steiger, contains Na₂O 20, K₂O 3.28, and H₂O 11.87, and appears to be a mixture of sericite and kaolin. It is very irregular, ranging from a mere film to 12 feet, and is used for lining the converters in the smelter.

The ore bodies are solid and composed of pyrite and chalcocopyrite usually, with a greater amount of chalcocite and occasionally bornite, with traces of the carbonates and native copper. Sphalerite and barite are generally present and frequently more abundant than the other minerals. One body of ore is said to have assayed 15 per cent copper, \$8 in gold, and 6 ounces silver per ton. Where the ore is largely chalcocite, the content of copper is high, sometimes reaching over 46 per cent, but the general range is said to be about 10 per cent.

In the Copper City mines the ores are of the same nature as at Bully Hill, but enclosed wholly in the sheared quartz porphyry. The shearing gives to this igneous rock the appearance of slate, but under the microscope the two are in general easily separated. The quartz porphyry passes into sericite schist in the shear zone, and is more or less heavily impregnated by sulphides, showing stages from partial to complete replacement.

The lode at Copper City runs N. 50° E., and the lenticular bodies range in thickness from a mere film or nodule in the fissile schist to 5 feet or more in thickness and many feet in length. Sphalerite and barite are as abundant in the ores of Copper City as at Bull Hill.

Iron Mountain District.—The largest and most important district of the copper region, as far as known at present, lies west of the Sacramento River and extends from Iron Mountain a few degrees east of north for nearly 20 miles to the Shasta King, near Kennett. The Iron Mountain Mine is under the management of Mr. Lewis T. Wright, who has with diamond drill done more than any one else to get an accurate idea of the ore bodies and their distribution in the district. The Iron Mountain Mine is marked upon the surface by a prominent gossan of limonite, which in the early days was mined for gold and silver. In places the gossan extends to a depth of over 100 feet, changing abruptly from the oxides to the sulphides, but upon the steep slopes bordering the canyons the gossan has been removed and the bodies of sulphides lie nearer the surface.

In the Iron Mountain vicinity there are two principal bodies of ore—one the Iron Mountain, and the other the Hornet. The Iron Mountain body is now being mined, and the large Hornet body has been thoroughly prospected. The ore appears to be wholly pyrites carrying copper, with an admixture of chalcocopyrite. The dark sulphides so common at Bully Hill are practically absent in this body, although at certain points in both the Hornet and Iron Mountain ore bodies there is considerable zinc, and the arrangement of the zinc in streaks gives the ore a schistose structure, which is referred to on the one hand as evidence that the bodies are true vein deposits, and,

on the other, that the structure comes from the replaced schist. Quartz is often present. Barite is absent.

The ore bodies are cut by small transverse faults, and their sides occasionally polished by movement since the ore was deposited. In the Iron Mountain District the ore separates easily from the wall-rock and at many points there are considerable masses of sericitic selvage, but none so large was seen as in the Bully Hill Mine. The wall-rock on both sides of the Hornet is quartz keratophyr, which, according to Hillebrand's partial analysis, contains 5.16 per cent Na₂O and only .40 per cent K₂O, with .015 per cent BaO and 74.52 per cent SiO₂. It looks quite like quartz porphyry but differs especially in containing more soda. It seems to be related to the soda rhyolites described by Palache, near Berkeley. Over 700 tons of ore yielded an average of 7½ per cent copper, with a range of 1 to 20 per cent copper.

Shasta King.—At the northern end of the Iron Mountain District is the Shasta King Mine, which is rapidly developing and about to erect a smelter. The ore body is in the form of a sheet with its greatest dimension north and south, dipping gently to the westward in strong contrast with the other ore bodies of the district. A selvage of sericite, from a mere trace to nearly a foot, generally separates the ore and country rock. At one point upon the upper side the ore appears to be "frozen to country rock," but this is exceptional. Near the surface a well-marked gossan of limonite, like that of Iron Mountain, prevails, but is less extensive on account of the steep slopes.

The ore is almost wholly pyrite and chalcocopyrite, with some sphalerite.

Balacala.—A short distance south of Shasta King and 1,000 feet above it is the Balacala. In both cases the rock appears to be keratophyr, generally quartz bearing, and the ore bodies strike nearly parallel; but at Balacala the dip is steep to the west. The ore body, which consists chiefly of pyrite with some chalcocopyrite, although irregular, is large and dips nearly parallel to the slope of the ravine so that short tunnels reach the ore. Gossan is rare on the steep slopes, but further northeast, where the mine was first opened, on a gentle slope east of Shasta King, gossan rich in limonite is prominent. Upon the borders of the ore bodies small nodules more or less lenticular occur in the schistose quartz keratophyr, and appear to illustrate in a small way the relations of the large ore bodies. They are composed of pyrite and they have no selvage. King Copper, Spread Eagle and a number of other claims in the same district are actively developing. In the Bully Hill and Iron Mountain districts great depths have scarcely yet been reached, but enough is known to suggest that secondary enrichment has played an important role in these deposits.

A NEW ALABAMA BLAST FURNACE.

Furnace No. 3 of the Thomas plant of the Republic Iron and Steel Company, at Thomas, Ala., was blown in recently in the presence of a large number of officials of the company. It was designed by S. V. Huber & Co., of Pittsburg. The furnace is 85 feet high, 18 feet 6 inches bosh diameter and 12 feet at the hearth. It will have a daily capacity of about 250 tons. There are twelve 6-inch tuyeres placed 8 feet above the level of the hearth. Two sets of copper blocks are to be found above the mantel, while below the mantel is a set of cast iron cooling plates, 4 feet high inside of a steel jacket, which extends down within 4 feet of the center of the tuyeres. The tuyere jacket is of cast iron, and above this is another set of copper cooling plates. The hearth jacket is 8 inches thick and 10 feet high and is cast iron. The cast house is 215 feet long and 90 feet wide. The furnace is provided with two 6-foot downcomers which connect to a dust-catcher 18 feet in diameter by 40 feet high. The dust-catcher is connected by a 6-foot main to a gas washer 20 feet in diameter and 40 feet long. The four Massisks and Crooke hot blast stoves are 22 feet in diameter and

85 feet high. There are eight batteries of Wheeler boilers, each of 400 horsepower. The furnace has two cross-compound, steeple type, blowing engines. The high pressure cylinders are 42 inches in diameter and the low 80 inches. The air cylinder is 84 inches in diameter and all have a stroke of 60 inches.

In the pumping station in the next building is a Wheeler condenser with wet and dry vacuum pump. There are two compound, duplex plunger pumps to feed the boiler and a 3,000 horsepower Cochran feed water heater. Three compound, duplex plunger pumps, each with a capacity of 3,000,000 gallons of water in 24 hours, pump to the standpipe.

PRODUCTION OF GRAPHITE IN 1901*

The production of crystalline graphite was 3,967,612 pounds, valued at \$135,914, as compared with the reported production of 5,507,855 pounds valued at \$178,761 in 1900. The greater part of this product was derived from the mines at Ticonderoga, N. Y., although the mines in Chester County, Pa., produced a considerable quantity. The mine in Clay County, Ala., which was in operation in 1900, produced approximately 150 tons of graphite during 1901.

The production of amorphous graphite in 1901 was 809 short tons, valued at \$31,800. Under this head is included the so-called graphitic anthracite of Rhode Island, and also the so-called Baraga graphite of Michigan. In addition to this production there has been considerable activity in developing graphite mines in Georgia, Montana, Dakota, and New Jersey; and, in the aggregate, some 2,500 tons of material have been mined and are awaiting the proper concentrating processes.

The amount of graphite imported into the United States in 1901 was 14,320 long tons, valued at \$895,375. It appears that the domestic production of crystalline graphite amounted to but little more than one-tenth of the consumption for that year. The greater part of the imports of higher grade graphite is derived from the mines of Ceylon.

The production of Canadian graphite in 1901 amounted to 2,190 short tons, valued at \$44,380, the output being mainly derived from the Brougham mines in Renfrew County, Ontario.

The manufacture of artificial graphite has increased greatly, the production during 1901 amounting to 2,500,000 pounds, valued at \$119,000, as compared with 860,750 pounds, valued at \$68,860, in 1900, and with 162,382 pounds, valued at \$10,149, in 1897, the first year of commercial production. The sole producer is the International Acheson Graphite Company at Niagara Falls, N. Y. More than one-half of the output for 1901 was in the form of graphitized electrodes for use in the manufacture of alkali and bleach by electrolytic processes, the remainder being consumed in the manufacture of paints, lubricants, pencils, motor brushes, crucibles and dry batteries.

RAILWAY CONSTRUCTION IN GUATEMALA.—United States Consul-General J. C. McNally reports that the work of constructing the Northern Railway from El Rancho to Guatemala City is progressing. The grading has been completed to Sanarate, about 50 miles from Guatemala City, and from there the work will be rapidly pushed forward. The road will be finished within the time specified in the contract, and six months from now trains will be running between Puerto Barrios and Sanarate. From the latter place to Guatemala City, a stage line will be established. The completion of the Northern Railway will be of great benefit to Guatemala, as it will considerably shorten the time to New Orleans. Only about six days will then be required to reach the United States from this city, while the trip on the Pacific side takes from seven to twelve days longer. Freight transportation also will be cheaper than by the Pacific route. The railroad was not at all affected by the recent earthquakes, and work on it is progressing in a business-like way.

*From advance sheets of a report by Dr. Joseph Struthers in *Mineral Resources of the United States, 1901*, now in press, United States Geological Survey.

AMERICAN SECTION OF THE INTERNATIONAL ASSOCIATION FOR TESTING MATERIALS.

The fifth annual meeting of the American Section of the International Association for testing materials was held at Atlantic City, N. J., beginning June 12 and continued until June 14. The object of the Association is to secure the adoption of standard tests and specifications which shall be accepted by the engineers and manufacturers of all the leading nations. Five sessions were held, the first being devoted to current business, while the others were given up respectively to the consideration of specifications, of steel, of cement and of cast iron. The reports and papers presented, according to the programme of the meeting, were as follows:

1. Report of the American branch of Committee No. 1.
2. Summary of the American and foreign comments on the standard specifications for steel adopted by the American Section. Albert Ladd Colby.
3. Discussion of the following modifications (shown in italics) in the standard specifications for steel rails (adopted by the American Section), embodied in the specifications for steel rails adopted by the American Engineering and Maintenance of Way Association, at the annual meeting in Chicago, March 18, 19, 20, 1902.

(a) *Drop Test.*—One drop test shall be made on a piece of rail not more than six feet long from every blow of steel. The test piece shall preferably be taken from the top of the ingot. The rail shall be placed head upwards on the supports, and the various sections shall be subjected to the following impact tests:

45 to and including	55.....	15
More than 55 to and including	65.....	16
More than 65 to and including	75.....	17
More than 75 to and including	85.....	18
More than 85 to and including	100.....	19

If any rail break when subjected to the drop test, two additional tests will be made of other rails from the same blow of steel, and if either of these latter tests fail, all the rails of the blow which they represent will be rejected, but if both of these additional test pieces meet the requirements, all the rails of the blow which they represent will be accepted.

(b) *Heat Treatment.*—The number of passes and speed of train shall be so regulated that on leaving the rolls at the final pass the temperature of the rail will not exceed that which requires a shrinkage allowance at the hot saws of — inches for 85-pound and — inches for 100-pound rails, and no artificial means of cooling the rails shall be used between the finishing pass and the hot saws.

(c) *Length of Rails.*—The standard length of rails shall be thirty-three feet. Ten per cent of the entire order will be accepted in shorter lengths, varying by even feet down to twenty-seven feet. A variation of one-fourth of an inch in length from that specified will be allowed.

The corresponding clauses in the Standard Specifications adopted by the American Section, are as follows (all differences are shown in italics):

(a) *Drop Test.*—One drop test shall be made on a piece of rail not more than 6 feet long, selected from every fifth blow of steel. The rail shall be placed head upwards on the supports and the various sections shall be subjected to the following impact tests:

45 to and including	55.....	15
More than 55 to and including	65.....	16
More than 65 to and including	75.....	17
More than 75 to and including	85.....	18
More than 85 to and including	100.....	19

If any rail break when subjected to the drop test, two additional tests will be made of other rails from the same blow of steel, and if either of these latter tests fail all the rails of the blow which they represent will be rejected, but if both of these additional test pieces meet the requirements, all the rails of the blow which they represent will be accepted. *If the rails from the tested blow shall be rejected for failure to meet the requirements of the drop test as above specified, two other rails will be subjected to same tests, one from the blow next preceding and one from the blow next succeeding the rejected blow. In case the first test taken from the preceding or*

succeeding blow shall fail, two additional tests shall be taken from the same blow of steel, the acceptance or rejection of which shall also be determined as specified above, and if the rails of the preceding or succeeding blow shall be rejected, similar tests may be taken from the previous or following blows, as the case may be, until the entire group of five blows is tested, if necessary.

The acceptance or rejection of all the rails from any blow will depend upon the results of the tests thereof.

(b) *Heat Treatment.*—No test specified.

(c) *Length of Rails.*—The standard length of rails shall be thirty feet. Ten per cent of the entire order will be accepted in shorter lengths varying by even feet down to twenty-four feet. A variation of one-fourth of an inch in length from that specified will be allowed.

4. Topical discussion on the question: "Is it Desirable to Specify a Single Grade of Open-Hearth Structural Steel for Bridges of Ordinary Spans?" Messrs. A. P. Boller, Theodore Cooper, J. E. Greiner, John McLeod, C. C. Schneider, J. P. Snow and others participated in this discussion.

5. Reports of American branches of international committees on all subjects other than those relating to cement and cement mortars.

6. Reports of committees of the American Section.

7. Finishing Temperature and Structure of Steel Rails. Albert Sauveur.

8. Tail Temperatures. S. S. Martin.

The discussion of the above papers was opened by Messrs. Robert Job and P. H. Dudley.

9. The Relation Between the Basic Open-Hearth Process and the Physical Properties of Steel. C. B. Dudley.

10. The Ethics of Testing. P. Kreuzpointner.

11. The Correlation of Cement Specifications. R. W. Lesley.

12. The Advantages of Uniformity in Methods of Testing and Specifications for Cement. G. S. Webster.

The discussion of the above papers was opened by Mr. W. A. Aiken.

13. The Chemical Analysis of Cement: Its Possibilities and Limitations. R. K. Meade.

The discussion was opened by Mr. Clifford Richardson.

14. Cement Testing in Municipal Laboratories. R. L. Humphrey.

15. Tests of Reinforced Concrete Beams. W. K. Hatt.

16. Reports of the American Branches of International Committees on Cement and Cement Mortars.

17. Notes on the Constitution of Cast Iron. Henry M. Howe.

18. Effect of Variations in the Constituents of Cast Iron. W. G. Scott.

Papers 25 and 26 were discussed jointly.

19. Present Status of Testing Cast Iron. R. G. Moldenke.

20. The Need of Foundry Experience for the Proper Inspection and Testing of Cast Iron. Thomas D. West.

21. A Quick Foundry Contraction Test for Metals. Asa W. Whitney.

Papers 27, 28 and 29 were discussed jointly.

22. High Strength of White Iron Castings as Influenced by Heat Treatment. A. E. Outerbridge.

23. Digest of Current Specifications for Cast Iron Pipe. Walter Wood.

MINERS IN ELBA.—The London *Engineer* says: "The Elba workman, who has always been pointed out as an example of painstaking activity, of a mild disposition, and modest requirements, has not been proof against discontent, and has learned to go on strike. In less than a year no fewer than four strikes have taken place in rapid succession in the iron mines. Resistance leagues have been organized in all the eastern towns of Elba, and the several delegates from these leagues will shortly open a Trades Union Council."

THE ONTARIO GOVERNMENT ASSAY OFFICE.

The laboratory report of the Ontario Government Assay Office located at Belleville and conducted by the Bureau of Mines for the assistance of prospectors and development of mineral lands, shows a total receipt of 86 samples sent in for examination during the month of April. The assays and analytical determinations aggregated 351, each checked off by a duplicate in order to avoid errors before issuing certificates. Of these 48 were for gold, 48 silver, 22 nickel, 26 copper, etc. Eight samples of iron ores from different parts of Ontario were received for partial or complete examination as to smelting quality. Four samples of raw and briquetted peat were received for analysis as to quality for fuel purposes. The Bureau of Mines required 39 determinations on which no fees were collected, 312 being done for private parties. The custom work for the public is done at about actual cost, fees collected from this source amounting to \$249.24 for April. Seventeen samples for identification, or report as to probable commercial value, as well as for qualitative examinations, were received, on which fees amounting to \$8 were collected. No charge is made for such examinations on samples brought personally to the laboratory.

In view of the fact that an extensive plant has recently been erected at Shawinigan Falls, Quebec, for the manufacture of aluminum from bauxite and other ores, information regarding the metal and its ores are thought to be of interest to prospectors in Ontario. The report, therefore, gives some particulars with regard to aluminum and its manufacture, and also in relation to the occurrence, appearance and characteristics of bauxite.

The following inquiries for minerals which may be found in Ontario have been received, and the office will put interested parties in communication with inquirers free of charge. Fuller information regarding any of the minerals asked for and their commercial uses will be sent free of charge to interested parties.

1. Three English metallurgical works and dealers are prepared to purchase molybdenite in large quantities, paying current market prices, which run about \$200 per ton for the first-grade product. The demand for this mineral is active, as its use in making an alloy with steel is increasing. Numerous finds of this mineral in Ontario have been reported and the difficulty seems to be to find a large workable deposit in one spot. The mineral is capable of being separated from ordinary gangue minerals by jigs, tables and vanners, so that a large deposit of molybdenite even though disseminated through the gangue is worth investigation as a concentrating proposition especially if adjacent to water power. Molybdenite resembles plumbago and stibnite very closely, so that any soft silver grey mineral found in flakes giving a black streak on paper is worth attention.

2. Two English metallurgical firms inquire for tungsten ores in Ontario. This mineral is used in steel manufacture.

3. An American dealer inquires for arsenical pyrites in large quantities.

4. A French dealer in ores and minerals inquires for names of producers of mica in Ontario suitable for export to France. Mica finds a steady and increasing use in electrical work, while the scrap or refuse mica is used for making boiler-covering, as a lubricant when ground, etc.

5. An American metallurgical firm inquires for occurrences of selenite in Ontario. Selenite is crystallized gypsum or sulphate of lime combined with water. It is generally found as clear transparent crystals easily splitting into layers. It has been found in Eastern Ontario in connection with mica deposits and also in gypsum beds as on the Moose River in the Hudson Bay slope.

GAS FROM PEAT.—Herr Glasenapp, an Austrian engineer, proposes to utilize peat on a large scale for making fuel gas, which can be piped to factories or other consumers.

THE NEW OIL GUSHERS AT JENNINGS, LA.

SPECIAL CORRESPONDENCE.

The latest gusher oil-field developed in the United States is near Jennings, a small city in Louisiana, situated on the main line of the Southern Pacific Railway, 93 miles east of Beaumont and 185 miles from New Orleans. It is in the heart of the rice-growing region of Louisiana, and until recently had nothing special to distinguish it from many similar small towns of the South. Since oil was first discovered it has taken on a livelier stir and the city has grown somewhat, but the coming in of the big gushers has created no boom like that which took place at Beaumont, and as the land in the vicinity of the gushers is closely held by strong companies—who announce that they do not intend to have the territory plugged full of holes like Spindletop—there will be no plunging speculative boom, but rather a steady development. The oil-field itself is about 6½ miles northeast of Jennings in Acadia Parish; the country about is slightly rolling and is cut into sections by the Mermentau River and its tributaries, which provide an outlet for small oil barges which supply the neighboring irrigating plants with fuel.

The field has been under development since the summer of 1901, when the Jennings Oil Company, of which the Heywood Brothers of Beaumont, are the chief stockholders, struck oil at 1,830 feet. This well flowed for 7 hours in August, 1901, but became clogged, and in endeavoring to clean it out it was spoiled and had to be abandoned. The Southern Oil Company also brought in a well which was a producer, but the difficulty and expense of drilling occasioned by the strong gas pressure and the loose sand seemed almost unsurmountable; the oil was there and if clogging could be prevented a good flow was assured. Finally in the latter part of May a lining was devised which kept out the sand and yet utilized the gas pressure to force the oil upwards. This lining was used in Southern Oil Company No. 3 well, and on May 21 the well came in with a roar, throwing a 6 inch stream of oil 175 to 185 feet high. The well was tested several times before being connected up with the settling tanks and showed no diminution of pressure: its capacity has been estimated as high as 70,000 barrels per 24 hours, but 20,000 to 25,000 is nearer correct. The well is 1,850 feet deep, and the boring was mostly through clay, sand, and "gumbo," only 8 feet of rock being encountered down to the cap-rock overlying the oil sand, and this cap-rock is only 8 inches thick. It is difficult to obtain any information as to the log of the well, but it is stated that the oil sand is more than 45 feet in thickness.

Southern Oil Company No. 4 came in on May 31. It is the same depth as No. 3, drilled in a similar manner and in every way equal to it except that being only a 4-inch well its capacity is less.

The wells partly turned on to lower the pressure are being flowed into the settling tanks, of which there are 2 in the field and 6 at Mermentau River, from which the small barges are supplied. A pump station on the field forces the oil through a 4-inch pipe to the river and to Jennings, where there is a 37,500-barrel iron tank. The facilities for transportation were ready for oil, showing the confidence of the operators in the field, but the pipe line and storage capacity will soon require enlarging, for the local consumption is large, and Louisiana purchasers will save the difference in freights on the Beaumont product.

The Jennings oil contains little or no sulphur, and its gravity is about 26° Baumé. Like Beaumont crude it has an asphaltic base, but is more easily handled and throws off no deadly hydrogen-sulphide gas. It will be more easily refined, and brings a higher price. In fact, it now sells at 35 cents per barrel, while Beaumont brings 20 to 25 cents.

It is impossible at present to determine the area of the field. Dry holes to the east, south and southeast seem to indicate that the field does not extend in those directions. The proven area at present is not more than 300 feet square, and wells are to

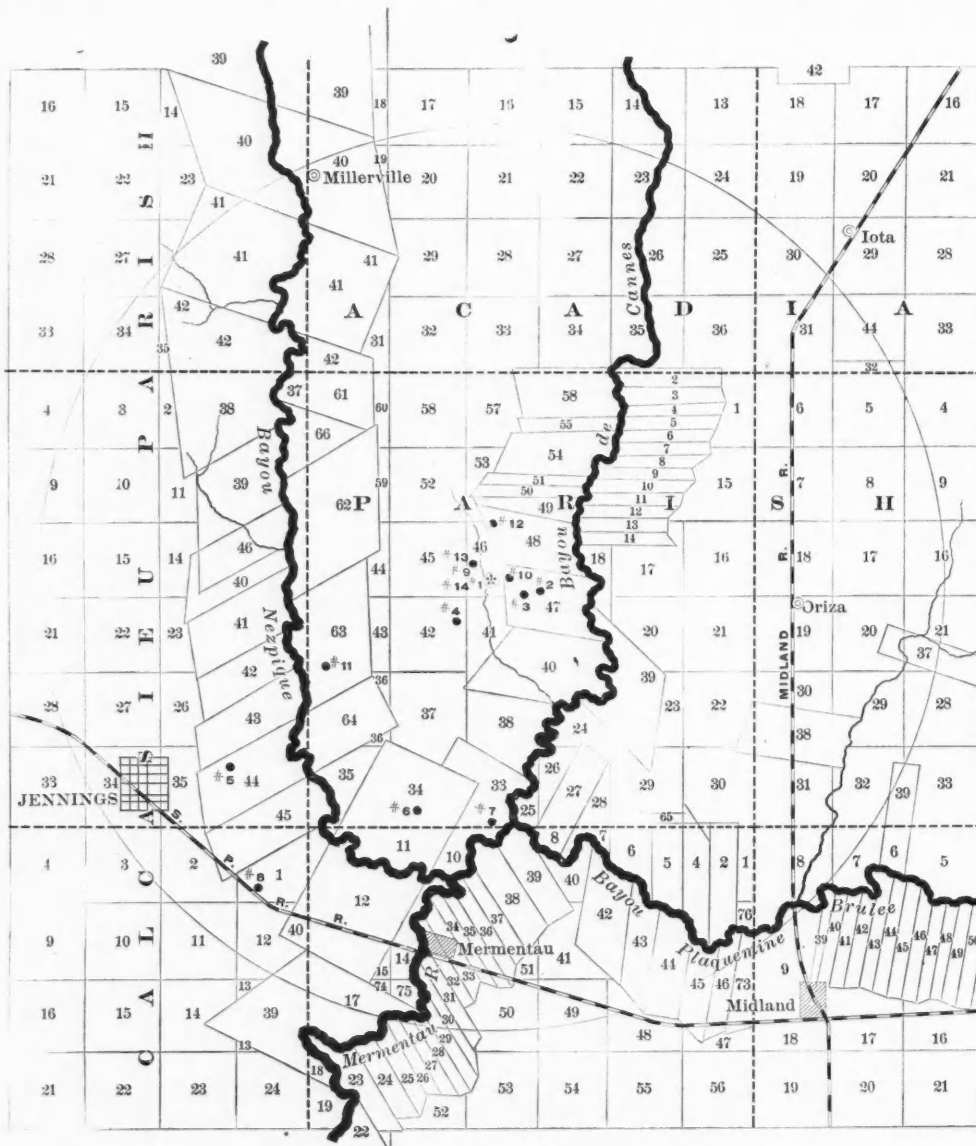
be drilled to the north, northeast and northwest of the gushers, which are only 125 feet apart; until these wells are completed nothing can be determined as to the area of the new gusher field. The field at Jennings and at Sour Lake presage other important discoveries in the Southern States, and while Spindletop may be always the biggest strike, other places will soon materially add to the world's production of petroleum.

BAUXITE.—Georgia produced the bulk of the domestic bauxite in 1901, the remainder being supplied by Alabama and Arkansas. The total production was

the exclusive privilege of importing cryolite into North and South America. In 1901 the production of aluminum sulphate was 74,721 short tons and that of crystallized alum was 7,755 tons.

LOCATING COAL LANDS IN CANADA.

New regulations have been adopted by the Dominion Government for the disposal of coal lands in Manitoba, the Northwest Territories and British Columbia. They provide that lands containing anthracite coal may be sold at an upset price of \$20 per acre, and coal, other than anthracite, at an upset



MAP OF THE JENNINGS, LOUISIANA, OIL FIELD.

- 1. Jennings Oil Co.
- 2. Crowley Oil Co., Drilling.
- 3. Prairie Mamon Oil Co., Drilling.
- 4 and 10. Jennings-Haywood Syndicate, Drilling.
- 5. Home Oil and Development Co., Drilling.
- 6, 9, 13, 14. Southern Oil Co.
- 8. Union Oil and Development Co.
- 11. Pelican Oil Co., Drilling.
- 12. Gusher City Oil Co.

18,905 long tons, valued at \$79,914, as compared with 23,184 tons, valued at \$89,676, in 1900. Bauxite is used mainly for the manufacture of aluminum, although a considerable quantity is used for the manufacture of aluminum sulphate and crystallized alum. The Pittsburg Reduction Company is installing a large plant at Bauxite, Saline County, Arkansas, which promises to increase largely the output from Arkansas in 1903. The imports in 1901 were 18,313 long tons as compared with 8,656 tons for the preceding year, an increase due mainly to the low ocean freight rates from foreign ports. This low freight rate caused bauxite to be delivered, duty included, from the South of France at New York, Philadelphia, and Baltimore, at a lower rate per ton than it cost to ship it from Georgia or Alabama to Philadelphia. The principal commercial salts of aluminum are aluminum sulphate and crystallized alum, for the manufacture of which bauxite and Greenland cryolite are used. The Pennsylvania Salt Company possesses

price of \$10 per acre, or, if the Minister of the Interior so decides, may be sold by public competition. A royalty at the rate of 10 cents per ton of 2,000 pounds will be collected on the output of the mine, and the operator must furnish the Government with sworn returns accounting for the full quantity of coal mined. Not more than 320 acres can be sold to one applicant.

Payment for the land in cash or scrip is to be made when the application is granted, or payment may be made of one-quarter of the purchase price only, and the balance in three equal annual installments, with interest at the rate of 5 per cent upon the unpaid balance.

Permission may be given to prospect for minerals upon land patented or entered, on which the coal mining rights have been reserved, upon payment of a fee of \$10, and undertaking to recompense the owner or occupant of the soil for damages that may be done to his land.

THE GEOLOGICAL RELATIONS AND THE AGE OF THE ST. JOSEPH AND POTOSI LIMESTONES OF MISSOURI.*

By FRANK L. NASON.

During the months of March and April, 1901, the writer was engaged in some engineering work for the Derby Lead Company, of St. Francois County. The nature of the work necessitated a study of the local geology. Incidentally this led to the exact determinations of the relations existing between the underlying St. Joseph, or Bonne Terre, and the overlying Potosi, as well as the age of the two limestones.

I am indebted to Mr. O. M. Bilherz, superintendent of the Doe Run Mine at Flat River, for first calling my attention to fossils which he had found, and to Mr. Arthur Thacher and Mr. J. T. Morrell, president and superintendent of the Central Lead Company, for the assistance which they rendered me.

The rocks of St. Francois County have a general, but very slight, southwest dip. The country is hilly, the higher points reaching from 100 to 150 feet above the datum level of Big and Flat rivers. The hills and ridges are not due, in general, to either monoclinal or anticlinal folds, but, so far as is now known, to erosion entirely. Both Big and Flat rivers have flood plains a mile or more in width, thus cutting through the overlying measures. Into these rivers on either side flow smaller tributary streams which have cut more or less deeply into the long divides, breaking them up into more or less hill-like domes. The gulches formed by these streams are dry and almost wholly denuded of soil, leaving the nearly horizontally bedded rocks exposed. As the summits of these hills are approached the mantle of residuary clay becomes thicker, and on the summits of many of the hills this clay, filled with drusy, cherty quartz, is often 50 to 100 feet thick. The limestones capping these hills and divides are more or less cherty, having cavities lined with druses of quartz, locally known as mineral blossom. In many places these same limestones have their jointing and bedding planes covered with the same quartz. In one locality the writer found a bed of sandy rock completely honeycombed with their shell-like druses. The bed was at least 1 foot in thickness. Immediately above and below at least 50 per cent of the rock was also drusy quartz. Underneath these strata the limestone becomes almost entirely free from quartz and in general appearance is hardly to be distinguished from the St. Joseph limestones. The occurrence of cherty or drusy quartz in a limestone has hitherto been the sole means of distinguishing between the Potosi and the St. Joseph. If the limestone was cherty it has been called Potosi; if not, St. Joseph or Bonne Terre.

Most of the gulches cut by the streams expose the contacts between the cherty and non-cherty limestones. As the cherty limestones show well up the sides of the hills, it has been assumed that only the summits of the hills and divides were Potosi.

In his geological map of St. Francois County, Mo.,† Mr. Arthur Winslow has accepted this erroneous conclusion and further states: "The rocks of this formation (Potosi) are found principally west and north of the area here treated of (St. Francois County), and they occur within it only over the hills. The upper limits of the formation are, therefore, not reached, and it is probable that no sharp line of separation between it and the underlying St. Joseph limestone exists."

The writer discovered a positive break between the two series in the bed of Flat River about 1 mile up the river from Elvins. Here the river has washed bare a heavy bed of limestone conglomerate. The appearance of the conglomerate is very striking, being composed of flat, round-edged, disks of limestone lying edgewise. The conglomerate here appears to be about 10 feet in thickness, and below the layer of disk-like pebbles, 5 to 6 inches thick, it is massive.

In the railroad cut above the river exposure, the conglomerate is seen to be overlain with soft clay slates from a few inches to several feet in thickness. From this up to the chertless Potosi, there is a succession of clay slates interstratified with thin beds of conglomerate. Judging by drill holes and by natural sections, the thickness of the conglomerate series is not less than 50 feet, and probably in places it is 150 to 200 feet thick. The conglomerate is not a mere local occurrence. From its outcrop in Flat River the writer traced it continuously for 1 mile toward the Central Lead Company's office; and in isolated exposures for another mile to near the Theodora shaft of the same company. Southeast, it was found on the face of a bluff about 2 miles from



A GUSHER AT JENNINGS, LA.

Farmington, about 4 miles air line from the original outcrop. To the west, near Irondale, a distance of about 8 miles, drill cores showed it to be present at a depth of 262 feet.

The pebbles of the conglomerate, as far as seen, are all magnesian limestone. The interstitial paste or cement is without exception a crystalline limestone, nearly, if not quite, pure. Accompanying the conglomerate is an oolitic limestone.

Although not traced continuously to the points noted, the conglomerate is assumed to be identical, for the following reasons: The disk-like conglomerate, the crystalline limestone paste, the oolitic limestone, and finally the invariable occurrence of fossils, principally trilobites and brachiopods; also beds of interstratified slate.

Fossils are very scarce in rocks of both formations save as here noted: *Lingulella* and *Obolella* in

or near the junction between the La Motte sandstone and the St. Joseph; in the bands of lead-bearing clay slate in the lower and upper lead-bearing zones of the St. Joseph limestone and in the slates of the conglomerate series; in the conglomerate paste (trilobites, brachiopods, pteropods).

The writer feels little hesitancy, therefore, in stating positively that the beds of conglomerate mark a break in geological time between the St. Joseph and Potosi limestones. There is no doubt that this division will be found to be widely extended, but at present nothing can be here offered in support outside of St. Francois County and the eastern edge of Iron County.

The Potosi will henceforth be recognized as including and lying above the slates and conglomerates, and will extend far down many of the streams instead of being referred to the hill tops above.

As to the age, its determination rests on fossils, and these have been submitted to Professor Beecher, who has generously consented to examine them.

ARSENIC AND LEAD MINES IN THE PYRENEES.

CONSULAR REPORT.

North of Barcelona, in the heart of the Pyrenees, some 9,000 feet above the level of the Mediterranean, is located a mining property which covers a surface of over 16,000 acres, or 6,500 hectares. The mineral wealth of this spot has been known from ancient times. Iron was worked here on a large scale until the middle of the nineteenth century. The valley of Ribas is the cradle of the well-known Catalan furnaces, ruins of some of which can yet be seen. When the forests that covered the slopes of the mountains disappeared—all wood having been burnt for the furnaces—working became impossible. Although iron is the least important of the minerals to be found in that district, the ore contains 54 to 60 per cent of metal; but copper to 4 per cent, arsenic to 0.5 per cent, and phosphorus and sulphur in excess render the ore difficult to use for large industrial purposes.

Since 1840, other minerals have been sought for, and mispickel containing an average of 45 per cent arsenious acid, with from 0.5 to 0.8 ounce gold, was worked with advantage. The fall in the price of arsenic, together with the practical impossibility of transport (to take a ton of ore from the mines to Barcelona costs more than \$100), caused the ruin of the enterprise. Subsequently, a French company was floated with the sole object of extracting the gold contained in the ore, but the enterprise could not succeed, as the gold did not cover the expense of treatment; besides which, in burning the ore in free furnaces, the whole valley was poisoned with the arsenic, and the company was obliged to pay a very large sum to indemnify the owners of cattle and crops.

It is only in the last few years that Messrs. Girones & Henrich, of Barcelona, purchased the mines and began working them on a paying basis. After having thoroughly investigated the ground, they explored the larger veins and succeeded in extracting over 3,000,000 tons of mispickel, of which several thousand tons were exported to England and other countries of Europe. The results of the sale of their ores, and especially the prices obtained from the residues after calcination, induced them to erect works at Badalona, a small town on the Mediterranean 4 miles from Barcelona. Besides the arsenical pyrites, they work the rich galena veins, containing an average of 53 per cent lead, 60 ounces of silver, and 0.6 ounce of gold to the ton, as well as copper veins carrying some gold.

The plant at Badalona occupies a surface of 18 acres. Part of the plant is in full working order and will treat 30 tons of arsenical ore per day. It has been erected by English engineers and is equipped with practical burners for the production of the very best quality of arsenious acid (As_2O_3), which is exported. The arsenious oxide is free from impurity.

*From the *American Journal of Science*, Vol. XII. November, 1901.

†Bulletin No. 132, of the United States Geological Survey.

STEEL HEAD-FRAME OF THE PARROT MINE, BUTTE, MONTANA.

The head-frame of the Parrot mine at Butte presents the latest type of steel gallows frame in use in the camp. The total weight of the frame is 125 tons, and has an estimated safe working load strain of 100 tons over the sheaves. The detailed drawings here presented show the form of the frame, the method of trussing and the arrangement of ore bins. Self-dumping skips with an ore capacity of 5 tons each are used. Owing to the moving nature of the ground, the footings rest on adjustment plates, the anchor bolts being utilized as jack screws to keep the frame in adjustment. The design of this frame was made by Mr. Nels Bodahl, construction engineer for the Amalgamated Copper Company.

THE SPECULATOR MINE, BUTTE, MONTANA.

Of the independent copper properties of this camp, not owned by any of the so-called "big companies," this mine is the most important, in the present state

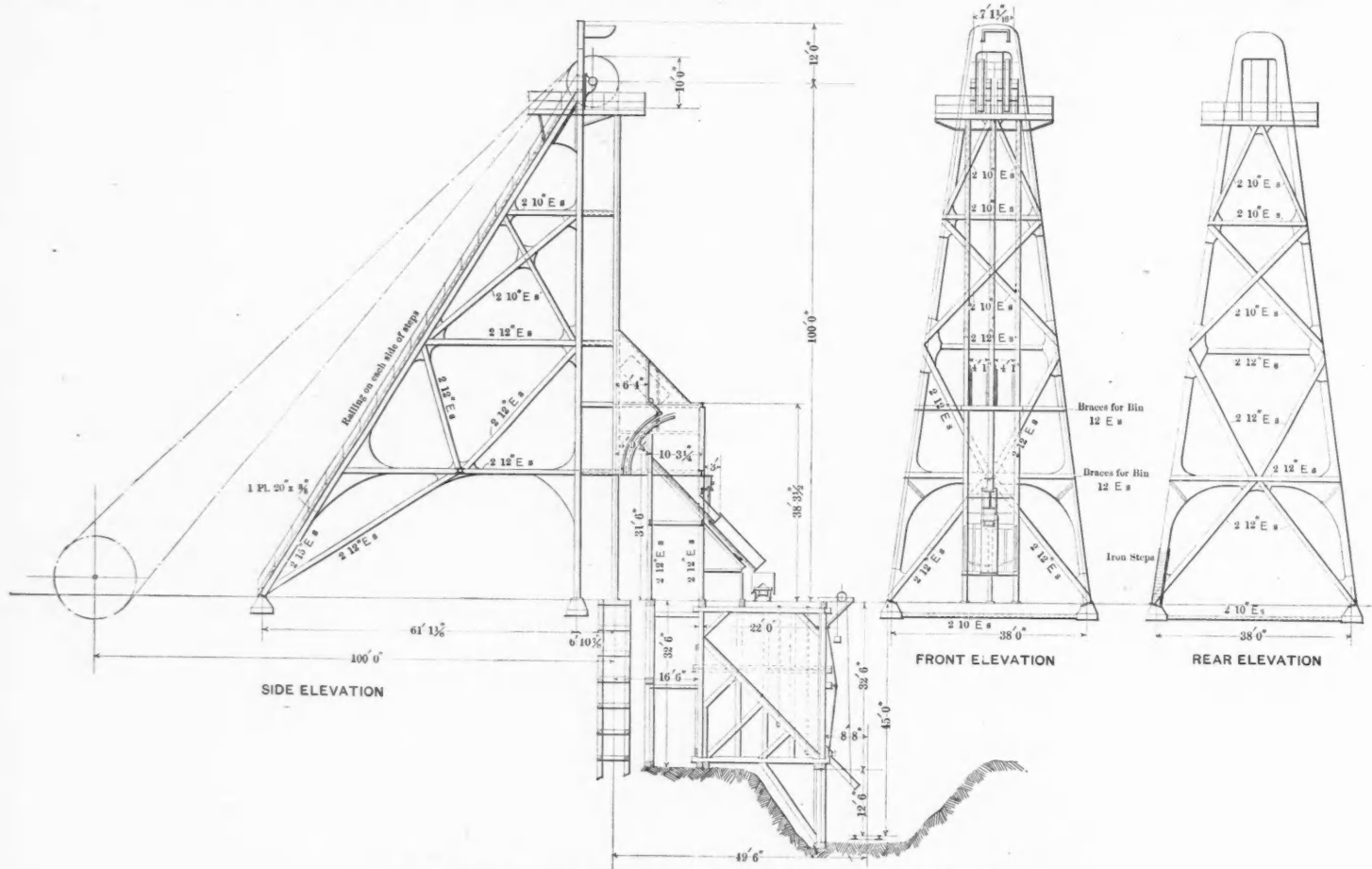
house inclosing the main opening to the mine, and thus minimizing the danger from fire. The head-gear of the Speculator consists of a steel gallows frame, 80 feet high to the sheaves. This frame is one of the lightest of the steel frames in the camp, its weight being about 50 tons. A first motion hoist built by Webster, Camp & Lane Company, of Akron, Ohio, is located in a brick and iron engine house. Grouped in convenient proximity are the assay office, machine shop, blacksmith shop, carpenter shop and fire department station, all equipped in a thorough manner. Situated on the slope of the hill a short distance below the collar of the shaft, is the brick and iron boiler house, where is also housed the air compressor. A battery of four 150 horse-power boilers is connected with a self-maintained steel stack 120 feet high. Everything is arranged with a view to gravity. Ashes from the boilers are taken away by a tram car through a tunnel that extends under the fore-hearth of the battery of boilers. A switch from the Butte, Anaconda & Pacific Railway delivers coal in the top of the boiler house, and

The property is owned by the Largey Estate of Butte, and John A. Creighton, of Omaha, Neb. W. W. Wishon is superintendent, and Patrick Sheenan, foreman. It is managed as a close corporation, and is a model mine in many particulars. While known to be very profitable, no information as to returns are to be obtained. The ore is sold to custom smelters, mostly to the works in Anaconda. The Butte, Anaconda & Pacific Railway receives the ore at the mine and delivers it to the works in Anaconda, a distance of 28 miles, at a carrying charge of 20 cents per ton.

NOTES ON THE GEOLOGY OF THE ISTHMUS OF PANAMA.

BY HENRY W. EDWARDS.

The trip across the Isthmus of Panama via the Panama Railroad offers little of interest in the way of geological exposures. The greater part of the route is across swampland, and little is visible except the usual dense tropical vegetation.



STEEL HEADGEAR AND ORE-BINS, PARROT MINE, BUTTE, MONTANA.

of development, and extent of known ore reserves. The property is located on the hill north of the Syndicate group, and first became famous some 10 years ago through a law suit with the Bell, one of the Syndicate properties, the suit known as the "Bell-Speculator suit" being the first "apex" contention affecting the copper zone of this camp.

The mine is opened to the 1,400-foot level. Sinking to the 1,600-foot, is under way, the shaft being now something over 1,500 feet in depth. The sill floor levels are 200 feet apart. Stations are roomy; the crosscut tunnels running to the ledge are double tracked, and all workings are lighted by electricity. The main shaft is of the regulation size used on the hill, and was started in the granite on the footwall side of the lead, thereby bringing it in the country rock throughout. The management concluded that it would be less trouble to maintain the shaft placed where it is, rather than in close proximity to the shaft where the ground is extremely heavy and of a moving character. The surface equipment is new and in line with the latest practice of the camp, by doing away with anything in the shape of a shaft-

all ore is loaded on cars from the ore chutes. Compressed air is utilized as an important auxiliary to the motive power throughout the mine. All mine pumping, the auxiliary hoists used under ground, and the drills are run by air.

The ventilation throughout the mine is perfect. Winzes started at a level on the hanging wall side of the lead, are sunk so that they reach the foot wall at the level next below. These winzes are equipped with cages and 5 by 8 double-cylinder hoists run by compressed air. The cages are used as means of communication with the stope floors between the levels. The winzes are located so as to aid the ventilation.

A 5-inch air column leads down to the various levels, where receiving tanks, equipped with electric resistance coils, are placed. These re-heat the air of the tanks, in order to increase its efficiency. Lamps of 16-candle power are used, and are arranged, or connected so as to be used for flash signals, arranged by a code. The system of timbering practiced is fairly illustrated in the accompanying photograph, showing a stope 50 feet wide on the 1,000-foot level.

What little there is to see may, however, be worthy of mention now that the canal question is so much to the front. As, owing to a twist in the isthmus, the route eastward (by South) leads to the Pacific and westward (by North) to the Atlantic—one may be pardoned if he should get a little mixed on the points of the compass.

The Atlantic terminus of the railroad, Colon (formerly Aspinwall), is situated on an island in the Bay of Limon; it might better be described as a dry patch of the apparently interminable mangrove swamp which lines the shores of the bay and penetrates a long distance inland. It is difficult in many places to distinguish the exact point where the sea begins. The island has been artificially increased in size by canal and railroad dumps. At the little bridge, which the railroad crosses from the island to the mainland, it is seen that the island itself is of coral. Reaching the mainland the road takes along the swamp of Mindi, fever-laden all the year round. During the dry season of the year it kills by a peculiarly vicious malarial fever, and the remainder of it breeds other fevers equally deadly.

Two kilometers from Colon the road skirts the Monkey Hills, where an insignificant exposure of bright red marl or clay is visible. As patches of this material are visible here and there all across the swamp, it is to be presumed that it rests immediately upon this red clay, or marl, but nothing to indicate what might in turn be beneath this red clay could be seen. Much of the enlargement of the Island of Colon is of the Monkey Hill marl.

At Gatun, two miles from Colon, is obtained the first view of the Panama Canal and of the famous Chagres River. Nearby the station of Gatun the road runs through a cutting of conglomerate, composed of rounded fragments of small gray pebbles of a fine-grained rock, apparently eruptive matter, cemented with a reddish fine-grained cement. The Chagres River here flows between high banks of red clay.

At Bohio, 15 miles from Colon, there is another rock-cut, again of conglomerate somewhat similar to that at Gatun, but the fragments are more angular, more crystalline, less cemented together and having here and there fragments of shells showing clearly its secondary origin and being obviously derived from the trachytic interior of the isthmus. There is also a conglomerate of black igneous fragments, and here and there an extensive quarry, whence the railroad has obtained its ballast. At Bohio the canal company proposed to build two locks, having a total lift of about 60 feet.

At San Pablo (24 miles from Colon) the railroad crosses the Chagres River and the canal. At this point the canal company intended to construct an enormous dam in order to supply the high-level section of the canal with water. At the point where the railway crosses, the river is confined on one side by a bluff of a whitish semi-hard stratified material, about the consistency of wall plaster, containing numbers of soft small kernels. It is, like the conglomerate previously described, evidently the deposited debris from the trachytic formation of the higher land in the interior. Much of the isthmus, both to the north and south of the railway line, is of this material. It would seem to underlay the conglomerate seen at Bohio.

At Matachin (30 miles from Colon and 40 feet above sea-level) the river, canal and railway follow along a gorge where is seen the so-called "bomb-shell boulders." This, as seen from the railway, appears as a series of bluffs formed of loose, round boulders, very black. In this gorge the first glimpse is obtained of eruptive rock in situ, together with several more or less weathered outcrops of andesite and diabase. The railway here leaves the main course of the Chagres River (which takes a sudden turn to the northeast) and ascends a tributary stream, a gentle gradient leading up to the Culelera summit.

Culelera is 37 miles from Colon, and ten miles from the Pacific. The visible formation is a very compact, dark-colored clay, with several intrusions of basaltic (or some similar basic igneous) rock. At no time during the railway journey is any of the trachytic rock, the debris of which forms so large a portion of the isthmus, seen in place, although on both sides of the route the higher ground consists of acid igneous matter, which appears to have overwhelmed the older basic igneous rocks.

The summit of the railroad grade is 260 feet above sea-level, and almost at the very top the route picks up, so to speak, the head waters of the Rio Grande, which are then followed to the Pacific.

During the run from Culelera to Paraiso (39 miles from Colon) the railroad passes through several cuttings of dark massive basalt, or diabase. At Paraiso it crosses a whitish conglomerate, very similar in appearance to that seen at Bohio. Quite suddenly the route then strikes the swamps of the Pacific side, and to Panama, the terminus of the road, nothing else is visible.

It is generally acknowledged that the basic igneous rocks just described are extremely ancient and that, therefore, the two oceans have not been in connection (at least at this point) since remote geologic period. As there are seven or eight proposed canal routes, it may be that one or more of these lines of

least resistance formerly afforded a clear waterway across, although the preponderance of opinion, based on the difference of the marine life, both fossil and living, of the two oceans is that there has been no communication in recent geological ages. It is possible, however, seeing how unconnected pools of fresh water, often quite near neighbors, possess an aquatic life, not always similar in species to those of nearest inhabited water, that the conclusions would be open to argument whichever way the evidence pointed. There can be no doubt, at least, that the two oceans were once very much less separated than they are to-day—indeed, a rise of 40 feet in the water-level would bring the sea to the foot of the Culelera Hill on both sides, thus narrowing the isthmus to some 10 miles or so. That this must have once been the configuration of the land is evident by the deposited shells in the formation at Bohio, 15 miles inland from the Atlantic, and the bed of secondary material at Paraiso 8 miles inland from the Pacific.

PRODUCTION OF BARYTES IN 1901.*

The output of crude barytes in 1901 was 49,070 tons, valued at \$157,844, a decrease of 18,610 tons from the production of 1900, which was 67,680 tons, valued at \$188,089. There was a gradual decline in the price per ton, from \$3.46 in 1898 and \$3.33 in 1899 to \$2.78 in 1900, which was partly due to the large production of low grade barytes. In 1901, however, the average price per ton was \$3.22, which is a decided increase over that of 1900, and is accounted for by the fact that a better grade of barytes was put on the market.

Barytes has been found in quantity in Connecticut, Virginia, North Carolina, Tennessee and Missouri, and, except Connecticut, these States have been producers of the mineral during the last few years. The mining is largely by open cuts, deep mining being too expensive in comparison with the price obtained for the product. The Virginia mines are in Bedford, Pittsylvania, Campbell and Tazewell counties, centering for the most part around Evington, Campbell County, Richlands, Tazewell County. At Evington the Hewitt mines have been worked almost continuously since 1874. The product is shipped to Lynchburg, Virginia, where it is cleaned and ground. In the vicinity of Richlands, Tazewell County, the Tri-State Mining and Manufacturing Company is erecting a plant of 50 tons capacity for grinding the barytes obtained from its large tract. In North Carolina barytes has been mined in Madison County near Marshall and Hot Springs; and it has been found also near Hillsboro in Orange County. The deposits of Tennessee are in Bradley, Monroe, Loudon, Cocke, and Greene counties. The Del Rio region, which is the most prominent, extends for 30 miles across Cocke and Greene counties from Wolf Creek to Newport, with barytes outcropping at intervals throughout this distance. Mines are worked also near Niota, Sweetwater and Cleveland.

The Missouri deposits of barytes, the largest producers in the United States, are in Washington, Miller and Cole counties, most of the mines being in Washington County, where the mineral is found over a large part of the surface.

Barytes is imported into the United States at the rate of a few thousand tons per year. The imports come chiefly from Germany, and the crude ore is brought over as ballast.

FRENCH IRON TRADE.—Imports and exports of iron and steel in France for the four months ending April 30 are reported as below, in metric tons:

	Imports.		Exports.	
	1901.	1902.	1901.	1902.
Pig iron.....	29,001	12,613	23,395	66,732
Manufactured iron.....	15,673	7,062	10,453	13,997
Steel	3,859	1,683	13,584	38,502

Imports of iron ore for the four months were 526,389 tons, against 547,399 tons for the corresponding period in 1901. Exports of ore were 94,103 tons, against 100,129 tons last year.

*From advance sheets of a report by Joseph Hyde Pratt in *Mineral Resources of the United States*, now in press; U. S. Geo. Survey, David T. Day, Chief of Division.

RECENT DECISIONS AFFECTING THE MINING INDUSTRY.

SPECIALLY REPORTED.

LAWS CONCERNING FORFEITURE OF MINING CLAIMS STRICTLY CONSTRUED.—The act of Congress authorizing the procedure by which the property of the co-owner of a mining claim may be forfeited must be strictly construed, and a notice of forfeiture of the interest of a co-owner, because of failure to contribute his proportion of the expenditures, is fatally defective if it does not specify the amount of money spent upon each claim, nor facts which might excuse the expenditure on each of the claims.—Haynes v. Briscoe (67 Pacific Reporter, 157); Supreme Court of Colorado.

DUTY ON STEEL TUBES.—Steel tubes with rough or ragged ends are considered finished tubes in trade and commerce, and as such are dutiable under paragraph 152, act of July 24, 1897, at the rate of 35 per cent ad valorem. The fact that such articles are not finished articles for the purposes of the particular purchaser for whom they were imported, but are to be subjected to further process of drawing for making bicycle tubes, will not take them out of the category of finished tubes, nor will such use make them dutiable as billets or steel in all forms and shapes under paragraph 135.—Appeal of Page, Newell & Co. from Collector of Customs at New York; Board of General Appraisers.

RIGHTS WHERE LOCATION IS IN EXCESS OF LEGAL QUANTITY.—Where a mining location was greatly in excess of the statutory limit, and the locator, on attempting to sell the same, discovered that there was an excess, and procured a person to locate a certain part of the original tract in his own name for the purpose of making a conveyance, such action was an assertion as to what the excess in the original location lay, so that on its appearing that the location by such party was void, a subsequent locator was entitled to claim that portion of the original location as excess.—Gohres v. Illinois & Josephine Gravel Mining Company (67 Pacific Reporter, 666); Supreme Court of Oregon.

ACTS PRECLUDING RESCISSION OF SALE OF MINING STOCK.—A party sought to rescind a purchase of mining stock on the ground of fraudulent misrepresentations as to the amount of ore in sight, the value of that in the dump, that a monthly dividend would be paid, etc. At the time he purchased he had stated his willingness to purchase a larger quantity if he had an opportunity to inspect the mine. He subsequently visited it on two occasions—on the first purchasing 2,000 shares additional, and on the second when it was evident that the mine was not as successful as had been anticipated, conferring with the president as to the best methods of continuing operations. Afterwards being in possession of all the facts concerning the mine, he negotiated for machinery with which to work the ore. It was held that this showed a ratification of the purchase after knowledge of all the facts alleged as fraud, and precluded recovery.—Eldridge v. Young America & Cliff Consolidated Mining Company (67 Pacific Reporter, 703); Supreme Court of Washington.

EVIDENCE THAT MINER WORKED AFTER ACCIDENT.—Where it was shown by written statements that a miner had worked for a considerable time after an accident, the mining company was entitled to have such evidence go to the jury, although it was stated by the miner that another person had done the work for him under his name and number. It was a material inquiry, under the issues in the case, to ascertain to what extent the miner had been injured, and how much time he had lost by reason of same. The statements showed that he had worked, been paid for, and drew supplies for 60 days, and the credibility of his testimony that it had been done by another was for the jury to pass upon. The written slips were evidence, being in the handwriting of the injured miner, and as such was competent to

contradict his oral testimony to the extent to which the accident had deprived him, and the permanence of his disabilities by reason of the accident.—*Home-Riverside Coal Mining Company v. Fores* (67 *Pacific Reporter*, 445); Supreme Court of Kansas.

LIMITATIONS ON TIME OF SUING UNDER LAWS OF WASHINGTON.—Under the laws of Washington, providing that an action may be brought within three years from an injury to the person or rights of another not otherwise enumerated, and another law providing that no action for personal injury to any person occasioning his death shall abate, nor shall the right of action determine, by reason of such death, if he have a wife or child living, but such action may be prosecuted in favor of such wife or child, an action may be commenced within three years by the widow and child of one who was killed by reason of the negligent act of a mining company.—*Robinson v. Baltimore Mining and Reduction Company* (67 *Pacific Reporter*, 274); Supreme Court of Washington.

JUDGMENT OF LIEN AGAINST MINING PROPERTY DOES NOT INVOLVE FREEHOLD.—In an action to recover certain interests in mining property the defense was made by cross-complaint that by reason of a contract they had an interest in the proceeds of the property, and asked for a lien for the money alleged to be due under such contract; which lien was given by the lower court. It was held that no appeal lay to the higher court because a freehold was not involved, although under such lien the property might be sold and if not redeemed all right in the property be lost. A right of freehold, giving jurisdiction to review, does not exist unless the right or title to the property is the direct subject of the action.—*Weiss v. Gullett* (67 *Pacific Reporter*, 155); Supreme Court of Colorado.

LIABILITY FOR OIL WELL SUPPLIES.—In an action for the price of oil-well supplies, the buyer filed a cross demand for damages resulting from failure to deliver the supplies. The only evidence tending to show that the buyer had notified the seller of the special time in which he would need the supplies, or of any contract for speedy delivery, consisted of conversations with the clerk in charge of the seller's office when the buyer visited it, and certain letters from the seller signed by such clerk. It also appeared that the seller had a local manager at the place where the supplies were purchased, and the clerk was not authorized to act in matters binding upon the company. It was said that the agency between the clerk and the seller was not sufficiently proved, so as to render the conversations of such clerk admissible to prove either the notice of the necessity or the contract for speedy delivery.—*Crane & Company v. Bloom* (67 *Pacific Reporter*, 449); Supreme Court of Kansas.

ABSTRACTS OF OFFICIAL REPORTS.

British Columbia (Rossland & Slocan) Syndicate, Limited.

The report of this company, as issued from the London office, gives the following statements for the year ending December 31, 1901: "The business of the financial year under review has been eminently satisfactory. In the report for 1900 it was stated that the syndicate was engaged in developing the Snowshoe Mine at Phoenix, British Columbia. This development was continued with results so satisfactory that your directors were able to dispose of the Snowshoe group of properties at a substantial profit, and, on June 20 last, a company, known as the Snowshoe Gold and Copper Mines, Limited, was formed to acquire the same. This company has a capital of £250,000, and your directors, having every confidence in the value of the mine, agreed to accept the purchase price of £150,000 in fully-paid shares in the new company. The syndicate is, therefore, the largest shareholder in the Snowshoe Gold and Copper Mines, Limited, and two of your directors are on the board of the new company.

The unfortunate miners' strike in the Rossland District temporarily crippled enterprise in that particular part of British Columbia, and operated to prevent mining companies proceeding with the development of their properties. On this account most of the mines in that district were closed down during the summer and autumn of 1901. The strike, though nominally in existence at the end of the year under review, was really settled somewhat earlier, as men from outside districts came in and took the place of those who had gone out on strike, and the large mines of the district are now working again. Fortunately the strike did not extend to the Boundary District, in which the Snowshoe Mine is situated.

"With reference to the interests of the Syndicate in the Yukon, your directors are still waiting to hear from the Canadian Government in reference to their application for the hydraulic lease of Uplands Creek, and hope shortly to receive a favorable reply in regard thereto.

"The profit and loss account shows a net profit of £19,424 after writing off £17,367 for preliminary expenses, development work, office expenses, directors' and auditor's fees, etc. In addition, 80,000 shares in the Snowshoe Gold and Copper Mines, Limited, valued at £80,000, have been transferred to reserve account. The nominal capital of the company is £100,000, and of this amount at December 31 last, 87,340 shares were issued. Of these 70,033 shares were fully paid, and 17,307 were 12s. 6d. paid up, leaving a balance of 12,660 shares to be issued.

American Cement Company.

The American Cement Company of New Jersey is a proprietary company, owning the stocks of the American Cement Company of Pennsylvania, the Leslie & Trinkle Company and the United Building Material Company. The report is for the year 1901. The capital stock is \$2,000,000 and the bonded debt is \$930,000.

The profit and loss account for the year shows earnings of subsidiary companies, \$246,335; balance from previous year, \$31,539; total, \$277,874. The charges were: Interest and sinking fund, \$79,813; depreciation, etc., \$15,954; dividends, \$160,000; total, \$253,767, leaving a surplus of \$24,107 at the close of the year.

The directors' report says: "The capital stock is unchanged. The amount of bonds outstanding has been reduced to \$930,000, bonds to the amount of \$35,000 having been purchased for the sinking fund in September last and cancelled. There has been no change in the lands and properties owned by your company, except that the firm of Lesley & Trinkle has been incorporated under the laws of the State of Pennsylvania as the Lesley & Trinkle Company. Your company owns all the capital stock of this company, except a few qualifying shares, instead of holding it as was formerly the case, through bill of sale. With the exception of the \$930,000 bonds still outstanding secured by the mortgage of November 9, 1899, all the property of your company is free and clear of all liens. All of your manufacturing plants have been maintained in the highest possible state of efficiency, and their capacity is now greater than it was at the beginning of last year. A large amount of money has been expended in repairs and improvements, all of which has been charged to cost of manufacture. In the twenty-eight months since the organization of this company, there has been over \$85,000 expended at your works at Egypt, Pa., in new construction, over and above regular and liberal expenditures for current repairs. Proper allowances have also been made for depreciation and reserve against doubtful accounts. The number of stockholders has increased from 785 in January last to 906 at the present time.

"The past year has been one of keener competition and lower prices in the cement industry than any previously experienced. In these circumstances it is a source of great gratification to the board that the earnings of your company have been maintained substantially on a parity with the previous year, and for this result great credit is due to the very efficient

management of your works and the judgment and skill which have controlled the operations of your selling agencies. Your sales increased in 1900 from 874,002 barrels to 977,682 barrels, and in the year just closed there was a further increase to 1,051,831 barrels. The lower level of prices established in the cement industry has greatly increased the use of cement, and emphasizes the necessity for the constant enlargement and increase of capacity of all progressive and prosperous plants.

"In the case of your company there is a practical as well as theoretical reason for increasing your output. A single contract now on your books will probably absorb one-half of your production of portland cement for the next two years. Several other large contracts already made will probably absorb the balance. You are therefore face to face with the proposition of either increasing the capacity of your works or practically declining new business. You have in your ownership a practically inexhaustible supply of raw materials of the most desirable grade and capable of the most economical use. You have selling agencies readily capable of selling at profitable prices double your present output. The demand for cement is constantly increasing. Modern building methods call for large quantities of cement, and for railroad use steel bridges are gradually being superseded by stone bridges, and within the last few years there has been a disposition to substitute concrete bridges for stone bridges. In this section of the country, moreover, many of the great railroad systems are undertaking great works in the shape of tunnels, terminals, track elevation, etc., which will consume an amount of cement that will probably tax the capacity of all existing works for several years to come. It is the opinion of your board that most of this additional demand will have to be met by existing companies. The cement industry in this country has now reached a point where there is a constant demand for the old and well-recognized brands which have successfully stood the test of 12 or fifteen years of actual use, but the new companies started within the last few years, manufacturing untried brands, have found great difficulty in marketing their output, even at concessions in price which destroyed all profit.

"Your board has given careful consideration to this subject of increasing your output, and has in view plans for the construction on your land, without any increase of your stock or bonded debt, of a new mill, having an estimated capacity of 500,000 barrels of portland cement per year. The control of this mill and of its output will be secured to your company by a lease, and the operation of the mill will, it is believed, yield a substantial profit to your company over and above the rental which will be payable. This rental will include an annual payment on account of principal, and will result in your company becoming the absolute owner of the mill at the expiration of a period of about 15 years. The addition which it will make to your output of portland cement will maintain your position in the trade, and enable you to accommodate your small as well as your large customers.

"Within a year it will probably be necessary to consider seriously the erection of works on your tidewater lands adjacent to Norfolk, Va. Exhaustive tests covering a series of years have been made of the material on these lands, which demonstrates that Portland cement can be made there of the same high grade as that manufactured at your present works in Lehigh County, and at a cost practically as low. The relief from the freight charges which your mills and those of every other company now have to pay for the transportation from mills to tidewater, would give a plant located at this point an advantage over any other works which nothing could equalize or balance. On both coastwise and export business, this plant would be beyond the reach of competition, and it would enjoy almost a monopoly of the business of the South. The probable early passage of an Isthmian Canal bill, together with the letting of large sewage and paving contracts in Havana, offer important markets for a seaboard works."

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.

Die Entwicklung des Niederrheinisch-Westfälischen Steinkohlen-Bergbaues in der Zweiten Hälfte des 19 Jahrhunderts. Volume II. Ausrichtung, Vorrichtung, Abbau, Grubenausbau. Volume V. Forderung. Berlin, Germany; Julius Springer. Volume II, 380 pages; Volume V, 516 pages; both illustrated.

Bericht über den VIII. Allgemeinen Deutschen Bergmannstag zu Dortmund, September, 1901. Prepared by the Editorial Staff of Glückauf. Berlin, Germany; Julius Springer. Pages, 272; illustrated. Price (in New York), \$5.25.

Mittheilungen über den Niederrheinischen-Westfälischen Steinkohlen Bergbau. Prepared for the VIII. Allgemeinen Deutschen Bergmannstag in Dortmund by the Verein für die Bergbaulichen Interessen in Oberbergamtsbezirk Dortmund at Essen-Ruhr. Berlin, Germany; Julius Springer. Pages, 340; illustrated.

Queensland; Annual Report of the Under Secretary of Mines for the Year 1901. A. R. Macdonald, Under Secretary. Brisbane, Queensland; Government Printer. Pages, 212; illustrated.

Register of Mines and Minerals of El Dorado County, California. Prepared under direction of Lewis E. Aubury, State Mineralogist, San Francisco; issued by the State Mining Bureau. Pamphlet, 20 pages; with map.

Statistical Year-book of Hungary. Volume 8; 1900. Prepared by the Royal Statistical Bureau. Budapest, Hungary; Aktien-Gesellschaft Atheneum. Pages, 472.

Report of the Director of the Mint upon the Production of the Precious Metals in the United States During the Calendar Year 1900. George E. Roberts, Director. Washington; Government Printing Office. Pages, 380; illustrated.

Coal Cutting by Machinery in the United Kingdom. By Sydney F. Walker, London, England; the Colliery Guardian Company, Limited. Pages, 144; illustrated. Price (in New York), \$4.25.

Fifteenth Annual Report of the Interstate Commerce Commission. Martin A. Knapp, Judson C. Clements, James D. Yeomans, Charles A. Prouty, Joseph W. Fifer, Commissioners; Edward A. Moseley, Secretary. Washington; Government Printing Office. Pages, 324.

BOOKS REVIEWED.

The Gold Mines of the World. Second Edition, 1902. By J. H. Curle. London, England; Waterlow & Sons, Limited, and Simpkin, Marshall, Hamilton, Kent & Company, Limited. New York; The Engineering and Mining Journal, Incorporated. Pages, 380; illustrated. Price, \$3.50, net.

Some months ago we published a notice of the first edition of this book, which related chiefly to the mines operated by British companies in South Africa, India and Australia. Since that edition was written, Mr. Curle has extended his travels and investigations to North America, and has embodied the results in a new edition. This is more than twice the size of the former book and treats of the gold mines of the United States, Canada and Mexico, as well as of those above referred to. The author has wisely limited himself to gold mines, which is a subject extensive enough for a single volume. He has taken up a comparatively new line, writing not so much for the mining engineer or the specialist, as for the investor and stockholder, although, necessarily, he treats of many technical points. He has taken up the different countries in order, treating the mines of each in succession, and writing not only in a

general way, but with reference to the large number of individual mines in each district. His investigations were originally undertaken as correspondent of the London *Economist*, and in the course of his work he has inspected a very large number of mines in different countries, and in this book presents the results of his observations. One point will be very quickly apparent to the writer, and that is, that he has written with an obvious intention of giving the facts, as he has seen them, with absolute impartiality. It is possible that in individual cases we may differ somewhat from the opinions he has expressed, but we must in all cases admit that they have been given without bias, and with the intention of giving the investor an idea of what he has seen and learned in such a form that any one ordinarily acquainted with mining investments can form his own judgment. In some places he criticises mining methods very severely, and he has much more severe criticism to make upon methods of flotation and organization of mining companies. The management of British companies, especially, he strongly condemns in many cases. For the operation of mines, with a view to the effect upon the Stock Exchange, he has no mercy whatever. The purpose and objects of the book is so well expressed in the introduction, and some of his remarks upon mine management in this part of the book are so apt, that we quote them here in order to give the reader some idea of its contents:

"In writing this book, and particularly in giving a description of any mine, I have tried to make the mine's value apparent to the shareholder, rather than to write for other mining men on technical matters. This is not a work on geology or mine timbering, or machinery, or modern mining processes, because all of these subjects have been written about by experts in each branch. It deals with mining rather with the financial than with any of these other sides. I suppose I ought to call myself a specialist in 'share values.' I have tried to give every shareholder, or would-be investor, an answer to that very relevant question, 'what is the value of such and such a mine? Shall I buy the shares: or shall I sell those I already have?' This, I take it, is what he most wants to know. After all, the money-making side of mining is the important thing; and therefore, dealing with that as I do, there is no need to apologize for a lack of description of details.

"I follow the example, which I set in the first edition, of mentioning no persons by name. Mining criticism of individuals, as I read it in books, pamphlets, or newspapers, is very apt to run to seed—to degenerate into mere gush, with here and there just a suspicion of advertisement. But that does not make me blind to merit. When a manager shows me a well-kept set of mine plans, or an exact cost-sheet; or an engineer, a well laid-out plant; or a mine-foreman, a cleanly-worked stope—I make a mental note, and it goes to the mine's credit in my final estimation of its value.

"Now let me—without the mention of names—pay a well-deserved compliment to the thousand or so mining engineers, managers, mine foremen, engineers, cyanide managers, surveyors, assayers, accountants, whose work I have inspected, and who have so materially assisted me in my work. The average mine manager, whether in South Africa, or Australia, or the East, or America, or wherever I have met him, is a self-reliant, capable man. Of course there are exceptions. Some managers are not capable; some are not even honest—but, as a rule, those in actual charge of gold mines to-day are men who can be relied upon. The special knowledge required by these men has to be almost encyclopedic in its range, while a strong grasp of the springs of human nature, the knack of choosing good lieutenants, the exercise of great tact, and the ability to govern, are all necessary requirements. To my mind the most valuable essential of all in a mine manager, and that an attribute which is often subjected to a severe test, in honesty. I am pleased to find that I number as friends and acquaintances many mine managers all over the world, who are honest men, and who have, over and over again, to their own

detriment, refused to do what they considered unworthy their position as managers and gentlemen.

"But I do not wish to confine my praise to the managers only. The mine captain, whose valuable qualities are known rather to the manager than to outsiders, is usually a most capable man, and devoted to his work. Many and many a time, after his hard day's work should have been over, has a mine captain cheerfully started off with me on a three or four hours' inspection of his workings, only too delighted to oblige, and asking merely that his visitor should show an intelligent interest in what he saw.

"To these men, and to the other heads of departments—to battery managers, cyanide work managers, assayers, samplers, surveyors, office staff—I owe a great debt, for much service cheerfully rendered me, and for the example of good work done day after day, year after year, with always a strict sense of duty, and a loyalty towards the company which shareholders do not often fully appreciate.

"For the directors of companies who sometimes try to corrupt these men, I have a strong contempt."

This extract will show something of Mr. Curle's methods and ideas. The chapters in the present edition devoted to the Yukon, to Alaska, the Rocky Mountain States and Mexico are full of information; and indeed the whole volume is well worth reading. The remarks on mine sampling and assaying are worth careful attention.

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.

The Metric System in the United States.

Sir:—In your very temperate comments upon my communication published in your issue of April 26 you credit me with making an argument against the adoption of the metric system under four different heads, whereas I said that "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." The references I made to some of the ways in which great expense would be entailed were only illustrative, and not intended to be either the arguments upon which the case rested or to indicate the principal disturbances that would ensue. The latter would probably be widespread in their ramifications, and doubtless more serious than any one man, or single group of men, will foresee; wherefore the probable effects of such a change as is proposed should be considered by a very large number of experts in the broadest possible manner.

Referring to your comments upon my suggestions as to some of the difficulties that would arise, it appears to me that you have misconceived my meaning, at least in one particular. I expressed no views as to the trouble of the American workman in learning the system, which is so simple that any intelligent mechanic ought to be able, with proper explanation, to acquire its principles in an hour or two. I happened to be in Mexico when the metric system was introduced there (compulsorily, which is the only efficient way); it was only a few days before the people of my hacienda were performing their transactions by the kilogram and meter, instead of the pound and the vara, without any apparent inconvenience. There is no close comparison between the intelligence of the Mexican peon and the American workman, but it is because of the very fact of the latter's superior intelligence, I conceive, that the introduction of the metric system would bother him. It is not the difficulty of learning the system that counts, but the difficulty of converting all of his previous knowledge and experience to new standards. The mechanics engaged in a special work do not appear to have any trouble in working with metric scales; at least, my own

experience with them in that respect has been quite in conformity with your own. It is true, I believe, that to a great extent the wonderful development of industry in this country has been due to the resourcefulness of the average American, his readiness as a jack-of-all-trades to undertake many kinds of work, and this characteristic is undoubtedly an important feature in our industrial life, and always will be, notwithstanding our increasing tendency toward specialization in manufacturing. It seems to me that the personal difficulty with the metric system would increase somewhat in the ratio of the degree of knowledge and field of effort of the individual. The laborer who is engaged in digging trenches for the foundation of a building would have no trouble at all; the masons and carpenters would have more; the architect and engineer would have most. I have learned to appreciate this by my own experience in foreign countries. It is easy, for example, to start a new survey and carry it on by the metric system; it is hard to carry forward an old piece of work on a different system. The change of systems would be inconvenient until all of our old work, or nearly all of it, ceased to be useful and we had learned to think metrically. You refer to the metric system being in general use in the science of chemistry. That is true; but it is not in general use in the chemical industry. The present generation of chemists learned to think by the metric system; men who graduated 30 years ago were never taught to reckon otherwise in their particular work.

However, all of this relates to personal inconvenience rather than to the direct pecuniary cost of the proposed change, which was my principal point; a point which was, I think, passed over rather lightly by you. I referred to the question as to whether a one-inch pipe would be known as a 25.4 or a 25 millimeter, using that example as typifying a kind of discrepancy that would be introduced; perhaps it was not the best example that might have been cited, because what we know as a 1-inch pipe is not exactly one inch in diameter, and might just as well be called 25 millimeters as 1 inch. I cannot believe, however, that you seriously mean that in order to avoid awkward decimals of a meter, or a millimeter, we should alter the existing standards, which we have laboriously arrived at; which are far more important than whether we measure them in inches, millimeters or barleycorns. There is a vast difference between altering our standards and replacing old devices with new and better ones, upon which you put so much emphasis. The principles are not at all analogous.

The adoption of the metric system in the United States has both advocates and opponents whose opinions carry great weight. Recently, Lord Kelvin appeared before the committee on coinage, weights and measures of the House of Representatives in strong advocacy of the pending bill. Mr. George Westinghouse also believed in the metric system, but expressed the opinion that it would take at least 10 years for the people to learn to use it. Mr. William Sellers, in a paper read at the few days ago, remarked that the passage of the bill meeting of the National Academy of Sciences a now before the House, which makes the metric system compulsory after a certain date in all the bureaus of the Government, would render valueless every plan in the Navy Department, would make it impossible to repair the engines of any ship, and these would be among the smallest inconveniences that would ensue. The National Association of Manufacturers at a recent meeting at Indianapolis adopted the following resolution:

"It appears to this association that the compulsory adoption of the metric system would probably affect the manufacturing interests of this country as follows: One-third, who are exporters to European countries and dependencies, would be benefited; one-third, who do business in this country and all other countries, would neither be benefited nor greatly injured; one-third, who do business in this country and in England and dependencies, would be seriously injured. For all this the expense and in-

convenience would be very great. In view of these conditions and of the further fact that the metric system is already legalized for the use of those who find it profitable, this association recommends that no further action be taken on this matter at this time."

Referring to the above conservative and cautious expression of opinion, the *New York Times* editorially summarized the condition thus:

"Those who find the metric system convenient in foreign business use it now; those who discover any advantage in using it are at liberty to do so; those who do not want to use it for any or all of the good reasons which have been urged against it by representative manufacturers and engineers should not be required to, at incalculable cost and inconvenience. Congress should let this matter alone. If the metric system has the advantages claimed for it, the increasing use of it by the American people will render legislation unnecessary; if our people do not want it, it is no part of the duty of Congress to crowd it down their throats."

In this rational view of the question, I think that engineers, manufacturers, builders, and the people at large will eventually agree. J. B. R.

New York, April 30, 1902.

QUESTIONS AND ANSWERS.

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

"Banket" Reefs.—Please give the origin of the word "banket" as applied to the gold reefs or veins of South Africa.—E. S. P.

Answer.—The name "banket" is said to have been applied to the gold veins of the Witwatersrand District in the Transvaal by the early miners in that district, on account of the resemblance of the gold-bearing conglomerate to a cake which was made by the Boer housekeepers, and which was commonly called "banket." This is the generally accepted origin of the word.

Changing Mining Location.—Can a person who has surveyed and recorded a mining location, upon finding his vein to have a trend different to what he at first supposed, amend his survey so as to follow the vein.—J. M.

Answer.—We are unable to find anything in the mining laws or in the regulations of the Land Office which would permit such a change. The regulations as to definite location, boundaries and description of a claim are very strict and must be carefully observed by applicants for a patent. We think that your only course would be to abandon your claim and to make and file an entirely new location in accordance with the course of the vein. There may be peculiar circumstances in your case, however, and it would be best to consult a lawyer familiar with mining claims.

Manganese Ore.—I have an ore deposit which shows as follows: Metallic iron, 9.36; metallic manganese, 13.66; nickel and cobalt oxides, 0.92 (mostly nickel); total insoluble, 51.52 per cent. Please advise me if this ore could be used in any way, or rather, if it is worth anything.—E. P. A.

Answer.—Taking the analysis as given, the ore is too low in manganese to be of much value. You do not say what the other contents of the ore are. It is possible that concentration might bring it up to a higher proportion of manganese. This is a case where an expert should be consulted, as it is impossible to give any definite opinion without further examination.

Natural Alum.—The writer has learned of the recent discovery of an alum mine, and is seeking some information regarding the number of mines in this

country, location, process of manufacture and probable value of a good mine. From what source can this be obtained?—G. H. H.

Answer.—Deposits of natural alum exist in New Mexico and in Southern California. They have been worked intermittently from time to time, but there has been no production from any of these deposits for three or four years past. The value of a deposit of natural alum would depend on several factors—its extent, the degree of purity, cost of working and location. The last point is of much importance, as the cost of transportation might be so great as to absorb all possible profit. This is the case with the deposits in the Southwest.

An elaborate article on "Alum and Sulphate of Alumina" was published in *The Mineral Industry*, Volume III.

Nickel-Cobalt Ores.—We have made a find of a lode carrying cobalt and nickel and some gold and silver, also a trace of copper, in quartzose gangue. A sample assayed gave Ni, 2.47 per cent; Co, 7.69 per cent; Cu, 0.75 per cent; Au, 0.2 ounce per ton. Ag, 15 ounces per ton. We suppose that considering the immense distance from here (Province of Rioja, Argentine Republic, S. A.) to any market, such ore would hardly bear the freight, which, either to the United States or to England, would be something between \$35 and \$40, but as we have a small reverberatory furnace in use for reducing copper ores, we expect it would be quite possible to smelt this ore in that furnace, making a nickel and cobaltiferous matte. The ore is pyritic.

What would the possible recovery of nickel and cobalt be, more or less, by such treatment and what special precautions would be necessary in order to obtain the best possible result? We understand that it would be necessary to make a rather basic slag in order to prevent the cobalt going into it in form of smalt. Is that so? Would it make any difference in the value of the product, mixing copper ores to the charge, making a matte containing copper, nickel and cobalt? Is there a fair demand for cobalt, and what would be reasonable to expect as obtainable per unit for this metal in such matte? Would you give us names and addresses of some buyers of it?

Does there exist any good literature on the metallurgy of nickel and cobalt describing the treatment of similar ore by smelting or otherwise, and if so what are the names of such books.—O. S. E.

Answer.—The demand for cobalt is not large; it is marketed chiefly as cobalt oxide. Your ore may possibly be more valuable for its nickel contents than for the cobalt. It would be, as you say, impossible to ship the ore at a profit under such freight charges. If you can make a good matte, it would be a different question. The metallurgy of nickel-cobalt ores is a somewhat complex question, and it would be impossible to give any opinion in this column which would be of value. It is a case where experts should be consulted and careful examinations made. This is especially the case with regard to the addition of copper to the matte, since the separation of the cobalt and nickel from the nickel-copper matte is a somewhat complex process. In the case of the ores of the Sudbury District in Canada, a successful commercial process was only worked out after long and costly experiment.

We should advise you to put yourselves in communication with the chief producers of nickel. Among these we may name the International Nickel Company—recently formed—which has offices in London and New York; the Société le Nickel, whose office is in Paris; and the Mound Nickel Company in London.

As to literature on nickel, it exists, unfortunately, chiefly in scattered form. You will find short chapters upon the subject in the works of Schnabel and other writers on general metallurgy. Chapters on the same subject have also appeared in the volumes of *The Mineral Industry*. There is no single treatise covering the whole subject. A book called *A Short Treatise on Nickel*, by M. Guillaume, has been published (in French) by the firm of Veuve Ch. Dunod, in Paris.

THE LAMPERT CONCENTRATING TABLE.

The accompanying illustration shows a new table just put on the market by the Lampert Ore Concentrator Manufacturing Company, of which Jacob Lampert is president, V. M. Came general manager, and Walter E. Crane consulting engineer, with offices in Denver, Colo. Though new to most users, the Lampert table is a development extending back to 1894, when its first tests were made. Circumstances prevented its extended manufacture until the present.

In the cut the table is shown in plan; it has a series of diagonally arranged riffles, which have a slight angle with the line of movement, and this

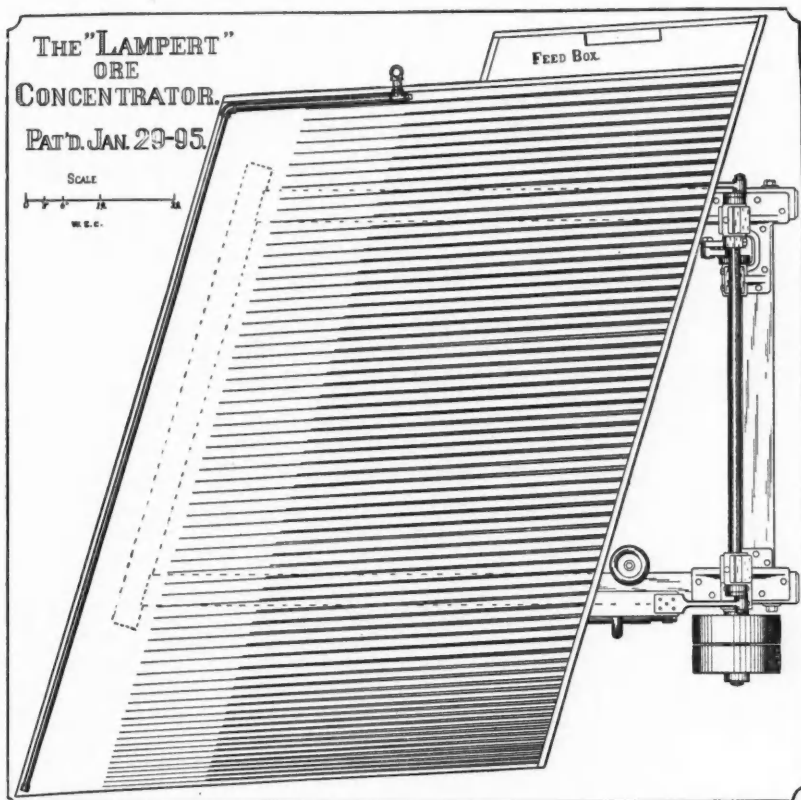
These springs are durable and readily replaced when necessary, and this mounting for movement provides no rolling or sliding surfaces which can wear out of true, and interfere with the nature of the movement, or upset adjustment of the table to its work. The adjustments include one to raise and lower the delivery side of the table; a second, to raise and lower the foot of the table; and a third to raise and lower the lower or delivery corner of the table independently. All these adjustments are made by turning hand-wheels, which operate on screws covered and protected from dirt and grit, and they do not require clamping.

In beginning its manufacture, the determination is

any pressure which the hose will stand without pulling loose, as so frequently happens with the ordinary bands used in attaching hose. This little device in itself is worth the price of the cleaner because of the annoyance which may be avoided by its use.

The Laconda Manufacturing Company, of Springfield, O., the manufacturer of this machine, will give full particulars, etc., of this new cleaner or of the other styles which it makes to any one who may be interested.

The company also continues to make the former No. 1 Weinland water power ball-bearing machine and the mechanical power-driven cleaner which are so well known to the users of tube cleaners.

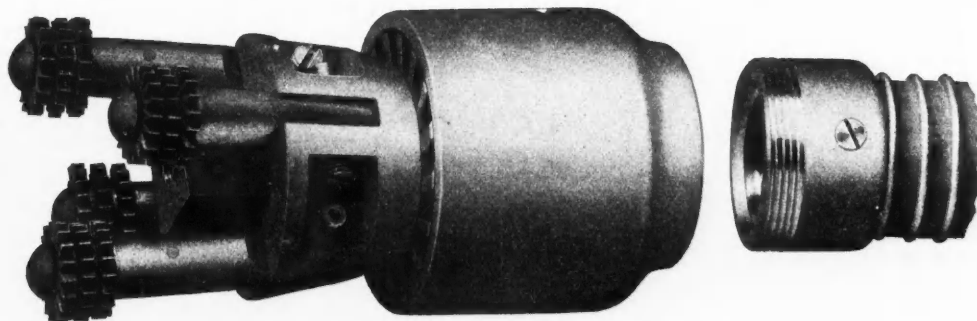


series extends much farther than usual in the direction of flow of pulp. Toward the last, the riffles are made gradually less and less in size to the edge of the table. The riffles taper, being of greatest depth at the right hand side of the table, with the raised part running out when about two-thirds across the table; from this point there is a slight drop-off from one riffle-plane to the next, and after this drop-off runs out, the remaining portion of the table is flat and smooth nearly to the side where the concentrates are delivered. A water-jet pipe extends over this delivery edge the whole length of

to make this table adaptable to the widest range of materials, efficiency and convenience.

THE WEINLAND WATER POWER TUBE CLEANER.

The accompanying illustration represents the Weinland improved No. 8 water-power boiler tube cleaner. The machine embodies the same general principles as other water power, ball-bearing cleaners made by this company. The improved machine, however, has been remodeled and has been made very much strong-



WEINLAND WATER-POWER TUBE CLEANER.

table. The table proper has a movement which is particularly adapted to separating the concentrates from the pulp, even though their respective gravities are close, and the movement is made adjustable to advance the concentrates at a more or less rapid rate toward the side.

The supports for the table top consist of four strong hickory springs which are secured to the adjusting devices at the sides of the frame beneath.

er than the older styles. The spider to which the arms are attached is now almost solid, so that it will withstand the severe strain put upon the arms. The bearings, including the balls, are larger so that they run with the least friction, and are consequently more durable. A new design of coupling is furnished with each machine; this coupling is a great improvement over former designs in this line. It holds the hose securely so that it will withstand

LIGNITE IN GREECE.—Up to the present time no attempt has been made to utilize the brown coal of Greece for the manufacture of briquettes, for which it is said to be well adapted. If such is the case, the extensive unworked deposits of this fuel with which the country abounds might be put to a profitable use.

PATENTS RELATING TO MINING AND METALLURGY

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 June 3, 1902.

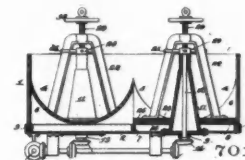
701,294. ART OF PUDDLING IRON.—Robert A. Carter, Pittsburg, Pa. The method consists in forming an ore lining for the bottom of the hearth, charging the metal to be treated on the hearth, melting, boiling and stirring the metal, adding ore to the charge during the boiling and stirring, and finally balling the charge.

701,298. PROCESS OF DEPOSITING METALS ON METALLIC SURFACES AND THE PRODUCT THEREOF.—Sherard Cowper-Coles, London, England, assignor, by mesne assignments, to the Sherardizing Syndicate, Limited, Westminster, London, England, a corporation of Great Britain. The process of depositing zinc on metallic surfaces which process consists in applying to the metallic surface pulverulent zinc partially oxidized and in submitting the same to heat.

701,311. PEAT-PRESS.—Alexander Dobson, Beaverton, Canada, assignor of one-half to Wilson Irwin, Toronto, Canada. The combination with the die-block containing a plurality of dies, of a compressing-plunger and an ejecting-plunger suitably supported and deriving a reciprocating movement, means for moving each succeeding die from underneath the compressing-plunger to a point below the ejection-plunger and a cleaning and oiling device rigidly connected to the plungers and deriving a simultaneous reciprocating movement with the plungers into an empty die.

701,315. SAND-REEL FOR OIL OR ARTESIAN WELLS.—Hiram W. Eaton, Jr., and Andrew Benson, Bradford, Pa. The combination with a sand-reel shaft, of a friction-wheel comprising radial arms connected by a rim, a series of courses of arc-shaped segmental cants arranged to break joints and applied to the opposite sides of the rim, the outer course of cants being of wood and the inner courses of compressed paper.

701,346. AMALGAMATING APPARATUS.—George F. Jernigan, New York, N. Y., assignor of one-half to Nelson T. Shields, New York, N. Y. The combination of a rectangular tank, a series of pyramidal projections or partitions mounted upon the bottom of said tank, a series of semi-



701,346.

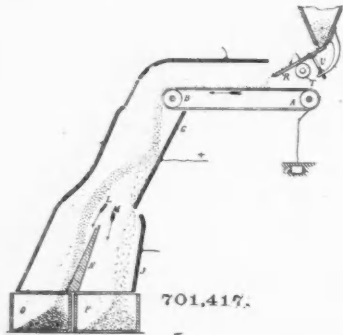
pyramidal partitions mounted at the sides of the tank whereby a series of connected mulling-chambers will be formed each having sloping walls, and a series of mullers rotatably mounted in each of said chambers whereby the rotation thereof will cause the material to progress successively through the several chambers and around the tank.

701,365. BRIQUETTE AND METHOD OR PROCESS OF PRODUCING SAME.—Edward S. Meade, Philadelphia, Pa. A process of weatherproofing and strengthening

briquettes composed of coal, coke, or the like, and molasses as a binding agent, which consists in subjecting them to sufficient heat to coke the molasses.

701,378. PROCESS OF MAKING PAINT.—David J. Ogilvy, Cincinnati, Ohio. A process of making zinc-oxide paints, which consists in treating zinc-white and a suitable vehicle with high-pressure or super-heated steam injected into the mass until the mixture has been sufficiently levigated and heated so as to be in a proper condition for straining or other treatment.

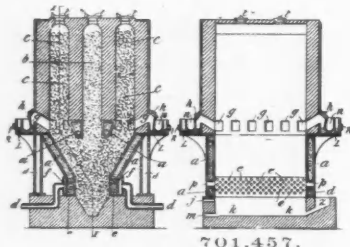
700,417. APPARATUS FOR SEPARATING CONDUCTORS FROM NON-CONDUCTORS.—Walter G. Swart, Denver, Colo., and Lucien I. Blake, Lawrence, Kan. A conducting-belt, a charged conducting-plate mounted substantially parallel to said belt at the discharge end of the same, a similarly-charged conducting-plate below said end of said belt, an oppositely-charged metallic conducting-plate



mounted near the discharge end of said belt and means to collect the separated particles, and a feeding device comprising a hopper, a feed-board adjustably mounted with respect to said hopper, a series of non-conducting feed-cords mounted to move relatively to said feed-board and means to move said feed-cords with respect to said feed-board.

701,429. PROCESS OF HARDENING COPPER.—Stanley L. Walter and Frederick W. Keiner, Ekastown, Pa. A method of hardening copper, which consists in placing aluminum and charcoal in a crucible, supplying to the crucible a superposed mass of copper, and then applying heat to the crucible, causing thereby combustion of the charcoal and generation of carbonic-acid gas which passes upward through the copper, carrying off any contained moisture in the metals and at the same time preventing oxidation thereof, whereby upon fusion of the metals, the copper, owing to its superior specific gravity, will intimately combine with the aluminum presenting a hardened copper alloy.

701,457. APPARATUS FOR OBTAINING ZINC OR OTHER VOLATILE METALS FROM ORES OR MATTES.—John Armstrong, London, England. The combination of a central column for the charge of mixed ore and fuel, side columns for the fuel, a reduction-chamber below into which they all converge, a large number of tuyeres or blast-orifices around the reduction-chamber whereby

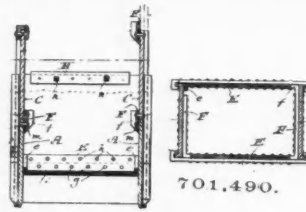


the blast is broken into minute streams, and therefore quickly deoxidized, a condensing device and exit-passages for the effluent gases direct to the condenser close adjoining, whereby the blast attacks evenly a layer of fuel below the part intermediate between the charge of the condenser, and raises the fuel above to a high heat and the effluent gases pass through this incandescent fuel above the hottest heating zone on their way to the condensers and the carbonic dioxide is changed to carbonmonoxide before it is cooled.

701,465. MIXING-MACHINE FOR CONCRETE, ETC.—William B. Cavin, Philadelphia, Pa. The combination of a cylindrical casing of greater height than width having a hopper at its top and opening into it at one end and having a discharge-opening at its bottom at the other end, a rotating shaft extending longitudinally through the casing and carrying spirally-arranged mixing-blades.

701,490. METHOD OF SINKING SHAFTS.—George J. Maas, Negaunee, Mich. A method of building and sinking metal shafts consisting in maintaining a series of shaft-plates in proper relative position to form a transverse section or zone of shafting incapable of lateral separation and capable of independent vertical movement; forcing said plates independently downward; building up the shaft by adding thereto other shaft sections or zones, the plates thereof aligning with those of the sections or zones below, and applying force independently to each of the plates of

said added sections to drive said added plates, and the plates below the same downward; and finally removing the material within the shaft.



701,497. PUMPING POWER FOR OIL WELLS.—Guy D. Newton, Cleveland, Ohio. The combination, in a pumping power for oil wells, of a vertical shaft, a pull-wheel journaled thereon, an endless internal bevel-rack attached to said pull-wheel by a suitable hinged connection, a horizontal shaft, and a bevel-pinion.

701,508. BOILER-CLEANING COMPOUND.—John A. Robinson, Berwind, Colo. A cleaning compound composed of the water from boiled potatoes, ammonia, sal-soda, coal-oil, black oil, wood-ashes and sulphur, combined with the dung or droppings from animals which chew the cud.

701,536. ELECTRIC PUMPING-ENGINE. Sven Brunau, Koping, Sweden, assignor to De Laval Steam Turbine Company, a corporation of New Jersey. The combination in an electric pumping-engine of a vehicle, an inclosing drum or cylinder supported on said vehicle and divided into two compartments, an electric motor disposed in one compartment and a rotary pump actuated thereby in the other compartment, and on the exterior of said cylinder means for connecting suction and delivery pipes to said pump-compartment and means for connecting a source of electric current to said motor.

701,547. WELL-BORING APPARATUS. John T. Davis, San Francisco, Cal. A well-casing, a hollow boring-tube therein composed of sections, a boring-head carried by said tube, a conveyor-flight and sectional conveyor-tube within the boring-tube, a gear-wheel connected by a feather and groove with the upper section of the boring-tube and means whereby sections may be interposed in the boring-tube and conveyor-tube.

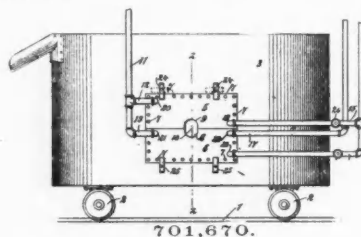
701,556. PROCESS OF MAKING WATER-GAS.—Emil Fleischer, Dresden-Strehlen, Germany, assignor to Jacob Eduard Goldschmid, Frankfort-on-the-Main, Germany. In the process of making water-gas from bituminous fuel by blowing up the fuel to high temperature and passing steam through it, the improvement, which consists in passing through the generator after the charging of a fresh quantity of fuel a quantity of air less than that used for blowing up the fuel and at rate slower than that used for blowing up and slow enough to generate producer-gas.

701,604. PROCESS OF MAKING CYANIDES.—George Ottermann, Vienna, Austria-Hungary. A process of producing cyanogen compounds from waste household substances and similar organic substances containing nitrogen, which consists in first subjecting said substances to destructive distillation, then bringing the resulting gases into contact with heated neutral material, then bringing said gases into contact with heated carbonaceous material, and finally bringing said gases into contact with heated nitrogen-absorbing material.

701,605. MANUFACTURE OF COLLOIDAL GOLD.—Carl Paal, Erlangen, Germany, assignor to Kalle and Company, Biebrich, Germany. The new process of preparing colloidal gold by adding to an aqueous solution of the alkali salts of the decomposition products of albumins (formed by the action of warm dilute alkalies on albumins) caustic soda lye and as much chloride of gold as slightly exceeds the quantity corresponding to the alkali present, heating this mixture until its coloration has changed into a bright red, dialyzing it against water, precipitating it with a dilute acid, dissolving the precipitate in dilute caustic-soda lye, dialyzing the solution again, and evaporating it.

701,606. MANUFACTURE OF COLLOIDAL SILVER.—Carl Paal, Erlangen, Germany, assignor to Kalle and Company, Biebrich, Germany. A process similar to that described in No. 701,605, only substituting silver for gold.

701,650. MANUFACTURE OF CALCIUM CARBIDE.—Douschan de Vulitch and Jules d'Orlowski, Paris, France. A process which consists in bringing a mass of lime in a molten state free from carbon into intimate contact with a liquid hydrocarbon, and permitting the same to cool in contact therewith.



701,670. TAPPING-JACKET.—Miles Barrett, Grand Forks, Canada, assignor of one-half to Francis H. Hutton, Grand

Forks, British Columbia, Canada. A tapping-jacket, comprising a receptacle for holding hot metal; a pair of hollow members, means for detachably securing said members upon said member for holding hot metal, and a plurality of pipes for circulating a fluid through said members independently.

701,690. MANUFACTURE OF ARTIFICIAL SANDSTONE.—Heinrich Engbert, Horde, Germany. A process comprising the agitation of pulverized slag under the action of high-pressure steam, adding thereto a material containing silicic acid, agitating again under the action of high-pressure steam, submitting the mixture in suitable molds to very high pressure, and finally drying the blocks thus formed.

701,707. PROCESS OF PRODUCING SILICA BRICKS.—Winfield H. Gibson, Homestead, and Henry Wessling, Hopechurch, Pa. A method or process of producing refractory brick or fireproof material consisting in mixing substantially pure coarsely crushed or ground silica with substantially pure silica reduced to a fine or impalpable powder, then drying and burning the same.

701,708. SILICA BRICK.—Winfield H. Gibson, Homestead, and Henry Wessling, Hopechurch, Pa. A refractory brick or fireproof material composed of substantially pure silica substantially free from lime and alkaline-metal silicates, and being substantially non-porous and of relatively great density.

701,743. PAINT.—Thomas L. Lee, Memphis, Tenn., assignor of one-half to Graham Stearns, Edgar Lee, and Thomas L. Lee, Jr., Memphis, Tenn. A herein-described paint composition consisting of distilled coal-tar, dead-oil, refined benzol, and Chickasaw ocher.

701,764. REVOLUBLE CAR-DUMPING STRUCTURE.—Erskine Ramsay, Birmingham, Ala. The combination with fixed track-rails, of a rotatable car-dumping structure provided with rails in alignment with the fixed track-rails and so arranged with relation to the axis of rotation of said dumping structure that the coupling-points of the cars will substantially coincide with the said axis of rotation, a hauling-rope connected to the cars substantially in line with said coupling-points, means for holding the cars in fixed relation to the dumping structure, and means for rotating said structure whereby one or more cars may be dumped by rotation of the dumping structure without uncoupling said cars from other cars.

701,800. FUEL-BURNER.—Charles A. Dally, Carnot, Pa., assignor of one-half to Nelson E. Whitaker, Wheeling, W. Va. A coal-dust burner for furnaces, comprising a hopper for holding the coal-dust; an air-chamber, a bladed gear-wheel mounted on a shaft running through said air-chamber; a perforated cup or shell loosely fitted in the base of said hopper; a gear-wheel secured to said cup to mesh with the bladed gear-wheel; a spiral bladed shaft connected to said cup or shell to extend into said hopper; means to rotate said shafts, and means for introducing air under pressure to the air-chamber.

701,806. APPARATUS FOR GENERATING GAS.—William J. Faulkner, Chicago, Ill. The combination of a receptacle provided with a lining or refractory material, means for delivering into such receptacle molten material; means for introducing combustible fluids into the receptacle and directing such combustible fluids against the molten material, a series of depending generators extending below the surface of the molten material, and means to discharge gaseous fluids into the generators and to deliver gas from such generators.

GREAT BRITAIN.

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

Week Ending May 22, 1902.

10,655 of 1901. MERCURY CATHODE.—G. and G. W. Bell, Liverpool. Improved form of mercury cathodes for use in electrolytic cells for decomposing salt.

10,890 of 1901. STAMP MILL MORTAR.—D. B. Morison, Hartlepool. Arranging mortar boxes of stamp mills to facilitate the removal of stems of stamps.

11,435 of 1901. CONCENTRATOR.—E. A. Sperry, Denver, Colo., U. S. A. A rotating concentrating table with eccentric vanning motor.

11,761 of 1901. STAMP MILL DIES.—J. G. Daw, Llanelly. Improved dies for stamp mills that rotate and are adjustable to constant level.

12,379 of 1901. MINER'S PICK.—G. S. Waterfall and C. H. Woods, Sheffield. A carrier for the blades of miners' picks.

12,729 of 1901. HYDROSULPHUROUS ACID MAKING.—E. Knecht, Manchester. Making hydrosulphurous acid by acting on titanium sesquichloride with an alkaline bisulphite.

14,751 of 1901. ELECTROLYSIS OF COPPER SALTS.—C. G. Tossizza, Paris, France. Method of preventing polarising in the electrolysis of copper salts.

16,359 of 1901. LIXIVIATION PROCESS.—A. Scheidel, Sydney, N. S. W. A continuous lixiviation process.

PERSONAL.

Mr. R. M. Raymond has arrived at El Oro, Mex.

Mr. Harry Coom is about to leave for Russia on a visit to relatives.

Mr. Theo. E. Schwartz has returned to Denver, Colo., from California.

Mr. E. G. Stoiber and Mr. H. N. Tod have started on a tour of the Yellowstone Park.

Mr. C. E. Hudson, mining broker of Salt Lake, Utah, is on a visit to Eastern cities.

Mr. John B. Hastings is on his way to the Thunder Mountain District, in Idaho.

Mr. J. Herron, the manager of the Tomboy Mines, at Telluride, Colo., will leave for London, Eng., in a few days.

Prof. W. H. Tibbals, of Salt Lake, recently examined the Boston-Idaho Company's property at Nicholia, Idaho.

Mr. Herman Poole, of New York City, has just returned from an examination of the Sheridan coal mine near Ironton, O.

Mr. Howard Wright, of Hancock, Mich., recently went to Montana to take a position with the State Geological Survey.

Mr. R. W. Brock, of the Canadian Geological Survey, has resumed his work in the Boundary District of British Columbia.

Mr. Tom Cox has resigned as resident manager for Larson & Greenough at the Morning and You Like mines, Mullan, Idaho.

Mr. George Bancroft has completed a lengthy inspection of mining property in Sonora, Mex., and has returned to Denver, Colo.

Mr. A. Mancho, of Baku, Russia, is now in the United States with a view to placing contracts for oil drilling equipment, etc.

Mr. Fred W. Bradley, of the Bunker Hill & Sullivan Mine, in the Couer d' Alenes, is examining the Ibox Mine, near Sumpter, Ore.

Mr. George Fraser, superintendent of the Arizona Copper Company's smelter, recently returned to Clifton, Ariz., from a trip East.

Mr. C. C. Brayton, of California, has gone to Dawson, Yukon Territory, to begin dredging work on the bars of the upper Yukon River.

Mr. A. M. Welles, consulting engineer, of Denver, Colo., has been making a trip through Idaho and Montana, examining some mining properties.

Mr. W. H. Thomas, of New York, is on one of his periodical visits to the British Columbia Copper Company's Mother Lode Mine, near Greenwood, B. C.

Mr. H. F. Fay, of Boston, Mass., president of several Lake Superior copper mining companies, is visiting the mines in Houghton County, Mich.

Mr. M. Bradley is now manager of the Lion Gold Mining Company, operating the Bradshaw mining group, Cherry Creek District, Yavapai County, Ariz.

Mr. John A. Reed, late assistant in metallurgy at the California State University, Berkeley, Cal., is to act as assayer for an American company in Honduras.

Mr. John Hays Hammond, accompanied by Mr. A. C. Beatty, is engaged in an inspection of the Camp Bird and the Stratton's Independence mines in Colorado.

Messrs. John Hoffman and John Craig, graduates of the University of California, have gone to Kimberley, South Africa, to take positions in the De Beers diamond mines.

Mr. Sydney F. Walker, of London, Eng., is now the technical editor of *The Colliery Manager*, the organ of the National Association of Colliery Managers in Great Britain.

Mr. John A. Walker, vice-president of the Joseph Dixon Crucible Company, of Jersey City, N. J., sailed for Europe on the North German Lloyd liner *Kaiser Wilhelm der Grosse* on June 17.

Mr. W. J. Prisk, formerly superintendent of the Guffey-Jennings Mines, Nova Scotia, is the new superintendent of the Sinker Tunnel, Silver City, Idaho, succeeding Mr. Fred Irwin.

Mr. James Rowland Bibbins has resigned as assistant electrical engineer of the Detroit United Railway to accept a position in the Westinghouse Companies' publishing department, Pittsburg and New York City.

Mr. Fred Johnson has been assistant superintendent of the various Cripple Creek properties of Mr. W. S. Stratton. Mr. Johnson is an experienced mining man, and will have practical charge of affairs until the appointment of a superintendent.

Prof. Charles E. van Barneweld, of the Minnesota School of Mines, recently examined the Amazon Mine at Butte, and the South Boulder Mine in Madison County, Mont. He is at present examining properties near Ruby, Okonagan County, Wash.

Mr. Samuel S. Fowler, of Nelson, B. C., local manager and engineer for the London & British Columbia Gold-Fields, Limited, was married at Nelson, on June

5, to Miss Frances E. Hedley, sister of Mr. R. R. Hedley, superintendent of the Hall Mining and Smelting Company's smelter at Nelson.

Mr. Henry Hiden, for several years purchasing agent for the Sloss-Sheffield Steel and Iron Company, with headquarters in Birmingham, Ala., has tendered his resignation, effective July 1. Mr. J. J. Ashton will succeed him. Mr. Ashton has been connected with the Sloss Company for several years.

J. D. Schilling, for 8 years superintendent of the Biwabik Mining Company's operations on the Mesabi Range, Minn., has resigned to accept the management of the Cornwall iron mine in Pennsylvania. Mr. Schilling made a great success at the Biwabik. He will be succeeded by Mr. J. S. Lutes, who has been assistant superintendent.

Mr. Albert I. Goodell, superintendent of the new smelter of the Montreal & Boston Copper Company, which is preparing to blow in near Greenwood, B. C., has returned from a business trip to the States. The Gates crusher and other plant for the sampling mill have been received. Smelting operations will probably start before July 1.

Professor Samuel Benedict Christy, professor of mining and metallurgy, and dean of the faculty of the College of Mining of the University of California, who has been connected with the University of California for over 30 years, received the honorary degree of Doctor of Science at the recent commencement exercises at Columbia University.

President A. W. Thompson and Secretary Y. B. Haagsma, of the Republic Iron and Steel Company, have returned to their headquarters in Chicago, Ill., after witnessing the big furnace at Thomas Ala., blow in. The officers were given a big banquet at the Sayreton coal mines last week by the superintendent and leading miners of the place.

President Galloway and Secretary and General Manager Garnsey, of the Galloway Coal and Coke Company, that has 4 mines in Walker County and 2 in Bibb County, Ala., with other directors and stockholders in the company, inspected the properties of the company last week and found affairs in fine shape. The company uses coal cutting machines in its mines in Walker County.

Mr. Charles P. Perin, consulting engineer of the Mine Securities Corporation; Asst. Prof. Henry L. Smyth, of Harvard University, and Mr. C. M. Weld, of Boston, are at Berners Bay, Alaska, examining the Northern Belle and Nowell properties in the interest of the Mine Securities Corporation. They are to be followed in July by Prof. Shaler, of Harvard, and Mr. Thomas J. Hurley, who will make the final examination of the properties.

Mr. R. A. Daly, now of the Canadian Geological Survey, but previously for about 10 years engaged in geological work in the United States, has joined Mr. W. F. O'Hara's party which is engaged in work connected with the re-survey of the boundary line between British Columbia and the State of Washington. Mr. J. M. Macoun is leaving Ottawa to spend some time with the same party. The first work undertaken this season will be a geological reconnaissance along the International Boundary line from the Boundary District to the Similkameen.

Governor Odell has named the following delegates to represent the State of New York at the International Mining Congress at Butte, Mont., September 1 to 5: William G. Rockefeller, August Hecksher, Warren Delano, Jr., B. Nicoll, J. B. Dickson, Cleveland H. Dodge, J. N. Judson, H. N. Brinsmade and James Gayley, of New York City; J. A. Burden, of Troy; C. H. Cady, of Mineville; James H. McNaughton, of Albany; A. E. Tower, of Poughkeepsie; A. H. Stower, of Plattsburg; W. T. Foote, Jr., of Port Henry, and William A. Rogers, of Buffalo.

Mr. Amos Sheperd, at one time chief clerk of the Minnesota Iron Company and later superintendent for the American Mining Company at Crystal Falls, and for a year or more assistant superintendent for Corrigan, McKinney & Co., at Crystal Falls, Mich., has been made superintendent for the latter concern and will move to Duluth, Minn., at once. He takes the place of Mr. Geo. W. Wallace, who is forming the Wallace Contracting Company, and will continue iron ore explorations. Mr. J. C. Vivian, who has been his assistant with Corrigan, McKinney & Company, also goes into the contracting firm.

Governor Montague, of Virginia, has named the following delegates to the International Mining Congress at Butte, Mont.: Rufus A. Ayers, of Big Stone Gap; W. E. Harris, of Staunton; G. M. Serpell, of Norfolk; C. Guy Larew, of Pulaski; John C. Robertson, of Manchester; George W. St. Clair, of Tazewell; W. H. Bond, of Wise; Charles R. Boyd, of Wytheville; Dr. John S. Apperson, of Wise; W. W. Bourne, of Rugby; George W. Palmer, of Saltville; Wyndham Robertson, of Buena Vista; Preston Trigg, of Abingdon; George L. Carter, of Bristol; O. J. Sands, John S. Fleming, Henry Froehling, R. H. Lindsay and Robert F. Morris, of Richmand.

Gov. Ferguson, of Oklahoma, has appointed the fol-

lowing delegates to the International Mining Congress at Butte, Mont.: T. J. Ballew, Geary; Frank Loy, Hitchcock; Thos. E. Rubey, Ferguson; H. K. Byckford, Alva; David Marum, Woodward; Wm. Cooley, Wildman; N. F. Shabert, Lawton; Wm. Wymer, Blackwell; W. T. Judkins, Hobart; O. K. Benedict, Hobart; Wm. Hughes, Arapahoe; Beeks Erick, West Hereford; C. H. Dewade, Geary; Bert Howard, Lawton; L. G. Gunn, Lawton; D. W. Armstrong, Omega; J. E. Tichner, Kingfisher; E. J. Kelly, Kingfisher; J. T. Wilde, Kingfisher; Dr. G. C. Elliott, Botsford; C. M. Cade, Shawnee; A. J. Seay, Kingfisher; Harvey McCandless, Perry; J. F. Caldwell, Fallis; D. P. King, Wellston; Hugh Scott, Wataunia; J. B. Culliston, Enid; Dick Brownlee, Talago; H. C. Hanna, Pawnee; T. M. Grant, Pawnee.

OBITUARY.

James Otis Watson, Sr., a pioneer coal operator in West Virginia, died at Fairmount June 12, aged 87 years. Mr. Watson was born in Marion County, near Fairmount, in 1815. He received a liberal education and entered the mercantile trade, with which he combined farming. With the completion of the Baltimore & Ohio Railroad to Fairmount in 1852, Mr. Watson acquired a small tract of coal land and worked it successfully. In a few years he laid the foundations of the industry which later developed into such great proportions. The climax to the work begun by Mr. Watson, and since vastly extended by his sons and other large operators, was reached when this year the organization of the Fairmount Coal Company, with \$12,000,000 capitalization, was effected. This was a result of the efforts of C. W. Watson, the youngest son of J. O. Watson.

James Hartford, vice-president of the well-known chemical manufacturing firm of Schoellkopf, Hartford & Hanna Company, New York City, died on June 12, aged 56 years. Mr. Hartford was born in Queens County, Ireland, and received part of his education in Kilkenny College. In 1879 he became buyer and representative of Burgoyne, Burbidges & Company, of London. In 1883 Mr. Hartford entered the employ of McKesson & Robbins, in New York City, and 5 years later the firm of Schoellkopf, Hartford & MacLagan was formed. In 1900 several interests were consolidated into the Schoellkopf, Hartford & Hanna Company. Mr. Hartford was also a director of the Magnesia Covering Company, a trustee of the Chemists' Club, and one of the first members and a director of the Drug Trade Club. He was the originator of the American branch of the Society of Chemical Industry, a member of the American Chemical Society and one of the council of the Drug Trade section of the New York Board of Trade and Transportation, of which section he was at one time chairman. Mr. Hartford was also a member of several fraternal and beneficiary organizations. He leaves a widow and one daughter.

SOCIETIES AND TECHNICAL SCHOOLS.

SOUTHWEST MINERS' ASSOCIATION.—The annual meeting will be held on July 8, 1902, in the rooms of the association, Los Angeles, Cal. All interested are cordially invited to be present.

COLORADO SCHOOL OF MINES.—The graduating class of this school during the past two weeks has been visiting mines and metallurgical works in the State, under the direction of three of the professors. There are about 130 applications for admission to the freshman class next fall. Many of the applications are from distant points.

GEOLOGICAL SOCIETY OF AMERICA.—The 14th annual meeting will be held in Pittsburg, Pa., July 1, in connection with the meeting of the American Association for the Advancement of Science. There will be an excursion under the direction of Dr. I. C. White through the coal measures of Western Pennsylvania and Northern West Virginia during the week preceding the meeting. During the meeting some shorter excursions are proposed under the direction of Mr. James R. Macfarlane.

UNIVERSITY OF WISCONSIN.—The summer school for apprentices and artisans will begin June 30 and August 8. The school is intended primarily to give to stationary engineers, superintendents of power stations, machinists, artisans and apprentices in various trades such mathematical, laboratory and shop instruction as would be found of most practical value to persons in these employments, and which could be imparted in the limited time of 6 weeks. The opportunities for laboratory and shop work are expected to be particularly helpful to students in correspondence schools.

MISSOURI SCHOOL OF MINES AND METALLURGY.—At the recent thirty-first annual commencement of this institution at Rolla the following degrees were conferred: Engineer of Mines, Edwin Thompson Perkins, Hermann Otto Schulze, Abraham Leonardo Fernandez. Bachelor of Science (Mine Engineering), Carlos Efrén Martínez, George Edwin Lyman, Harry

Noel Rex, Ernest Albert Mortland, Edward James Morris, Albert Hill Fay, Benjamin Newton Norton, John Lewis Pickles, Lawrence May. Civil Engineering, Francis Henry Walsh. Chemistry and Metallurgy, Albert Dyke Wilson. General Science, Cornelius Mark Daily. The annual commencement address was made by Prof. William P. Blake, the director of the Arizona School of Mines.

YALE UNIVERSITY.—The university has received for the Sheffield Scientific School a new building for mineralogy, geology and physiography. The donor and the value of the buildings are not announced, but it is to be known as Kirtland Hall, in memory of the late Prof. Jared Potter Kirtland, of the class of 1815, who was professor of the theory and practice of medicine in Ohio Medical College and in Western Reserve College, and died in 1877. He was a member of the National Academy of Sciences, and served on the geological survey of Ohio. Plans for the new building show a 4-story structure of 95 ft. front and 65 ft. depth. It will be of plain red brick, with white marble and other stone trimmings. The main floor will be devoted to mineralogy, the second floor to inorganic and physical geology, the third to physical geography and physiography, and the basement to mining.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION.—This society will hold its 10th annual meeting at Pittsburg, Pa., June 27 and 28, in the lecture hall of the Carnegie Institute. The papers to be read include: "The Efficiency Factor in Engineering Education," by Robert Fletcher, Dartmouth College; "The Needs of Engineering Colleges," N. Clifford Ricker, University of Illinois; "Methods of Grading Students in Engineering Colleges," C. P. Mathews, Purdue University; "Subdivision of the Field of Chemical Engineering Education," Edward Orton, Jr., Ohio State University; "Electrochemistry as an Engineering Course," C. F. Burgess, University of Wisconsin; "Courses of Instruction in Irrigation Engineering," Elwood Mead, University of California; "Laboratory Notes and Reports," F. C. Caldwell, Ohio State University; "Over-Development in Engineering Laboratory Courses," F. P. Spalding, University of Missouri.

ENGINEERS' CLUB OF ST. LOUIS.—At the meeting on June 4, 23 members and 6 visitors were present. Mr. R. H. Tait read a paper entitled "Mechanical Refrigeration." Early attempts at refrigeration were described. The first storage house was built in 1858 and used ice. The scheme included a drying device and a ventilating fan similar to those used to-day. Some years later the method was greatly improved by the use of a mixture of salt and ice. Refrigerating machines were built as early as 1775. These early machines all used rapid evaporation as the means for producing cold temperatures. The first compression machine was built in 1834 and used ether as the refrigerating medium. The system most largely used to-day is the "ammonia compression" system. Ice-making and refrigerating machines are now made of any desired capacity. The cost of a plant, exclusive of buildings, will range from \$2,500 per ton for a plant making one ton of ice per day to about \$500 per ton for a hundred ton plant. The cost of production will be about \$4.50 per ton for a one-ton plant and about 60c. to 70c. for a 100-ton plant.

The distribution of refrigeration from a central station is a comparatively new art, but has passed the experimental stage. The first pipe-line system was laid in Denver in 1899 and the second in St. Louis in 1900. The methods of construction of the pipe-line, of making connections to customers and the details of operation were described. The service supplied ranges from a single beer faucet in a saloon to large cooling chambers in the packing houses. The present pipe-line in St. Louis includes about 12,000 ft. of mains and 5,000 ft. of laterals. An additional 11,000 ft. of mains now under construction will make the St. Louis refrigerating pipe-line the largest in the world.

In the discussion which followed, Messrs. Klauder, Humphrey, Ashton, Trepp, Bary, Russell and others participated.

INDUSTRIAL NOTES.

T. Shriver & Company, of 33 East Fifty-sixth street, New York City, have recently installed a filter press plant at the De Lamar Copper Refining Works, Carteret, N. J.

The Apex Equipment Company of New York City has furnished the El Paso & Southwestern Railroad with 10 60,000-lb. cars, and is to furnish the same road 2 50-ton freight engines.

The Utah Mining Machinery and Supply Company has been designated Utah agents for the J. George Leyner Drill Company and the Leyner Drill branch office in Salt Lake has been discontinued.

The Ingersoll-Sergeant Drill Company, of Easton, Pa., is reported to be preparing to ship considerable machinery for use in Transvaal mines. The first shipment will comprise over 200 tons of drills, etc.

At the recent annual meeting of the International Steam Pump Company, Samuel Untermyer and E.

C. Converse were elected directors, succeeding Charles N. King, and T. L. Herrmann. The other directors were re-elected.

M. H. Treadwell & Company, engineers, founders and machinists, have opened engineering and selling offices at 97 Liberty street, New York City, and at 307 Fourth avenue, Pittsburg, Pa., with ample facilities to take care of customers.

The Keystone Driller Company, of Beaver Falls, Pa., recently struck a gas well on its property that has a rock pressure of 265 lbs. The well furnishes enough gas to run 3 large engines and a large boiler in the plant which operate some steam hammers.

The Ironsides Company, of Columbus, O., says that its latest specialty—the Ironsides improved patent Tormay mine car wheel oiler—is being rapidly adopted at the principal mining plants of this country, and that the general demand has taxed the company's facilities.

The Structural Steel Car Company, of Canton, O., is preparing to erect additional buildings as soon as the first shops are completed. As originally planned the shops were to have a capacity of from 20 to 25 cars per day, but orders have already been booked for 4,253 cars. The company is also considering erecting a blast furnace and a steel plant.

The Bradford Gas Engine Company, of Bradford, Pa., and the Flickinger Iron Works, of Cochranton, Pa., have been consolidated, and will hereafter be known as the Flickinger Iron Works. The plant at Cochranton will be abandoned, and in the future all of the work of the company will be done in Bradford. The buildings will be enlarged and the output doubled.

Wickes Brothers, of Saginaw, Mich., manufacturers of boilers, heaters, saw mill machinery, etc., have purchased the Davis-Chambers white lead works and considerable adjoining property in Pittsburg, Pa., and will improve it by erecting large machine and boiler shops, to be operated as a branch of the Saginaw works. The company recently secured a large machinery warehouse in Jersey City, N. J.

The Snow Steam Pump Company was recently awarded a contract for furnishing two pumps with a daily capacity of 15,000,000 gals. to the Allegheny, Pa., pumping station; the Allis-Chalmers Company, of Chicago, Ill., was awarded a contract for a pump with a daily capacity of 5,000,000 gals., and the Pittsburg Gage and Supply Company was awarded the contract for installing the boilers and stokers for the plant.

The Riter-Conley Manufacturing Company, of Pittsburg, Pa., has recently decided to adopt alternating-current motors exclusively for power distribution. It has purchased 3 200 k. w. engine-type Westinghouse generators which are to be direct-connected to Westinghouse gas engines using natural gas. Alternating currents will be used for all work, including cranes, and a number of Westinghouse type "F" induction motors will be geared directly to straightening rolls.

Pioneer Furnace, No. 3, of the Republic Iron and Steel Company, at Thomas, Ala., is one of the largest in the South. The stack is 85 ft. high, 18½ ft. in bosh, with a 12-ft. hearth, and will have a daily capacity of from 250 to 300 tons of pig iron. The equipment comprises 4 Massick & Crooke's hot blast stoves, 22 ft. diameter and 85 ft. high, 8 Wheeler boilers of 400 h. p. each, 2 cross compound steeple type blowing engines with a stroke of 60 in., and fly wheels 24 ft. in diameter; Wheeler condenser with wet and dry vacuum pump, and 2 compound duplex plunger pumps to feed the boilers. An electric plant is also provided for light and for power, for loading charging cars and carrying them to the top of the furnace.

The Electrical Equipment Company, Monadnock Block, Chicago, Ill., has been awarded a contract for the complete installation of a 2,500-h. p. electric transmission plant, on the St. Joe River, at Constantine, Mich. The equipment includes 6 400-h. p. and 2 60-h. p. water-wheels to operate under a 12-ft. head. The main drive will be divided into 2 sections, with 3 of the larger wheels geared to each shaft and direct-connected to a 600 k. w. revolving field, alternating current generator. Each of the small wheels will be direct-connected to a 35 k. w. direct current generator to furnish exciting current. In addition to furnishing power for manufacturing purposes, the plant will furnish light for Constantine, Three Rivers and White Pigeon. Several new industries, including a calcium carbide plant, will be located at Constantine. The plant will be in operation December 1.

The Bradley Manufacturing Company, of Pittsburg, Pa., was recently organized for the purpose of acquiring the American rights to build the Willans central valve engines. The works will consist of a main building, erecting shop, pattern shop, storage house, engine and boiler room. The buildings are being constructed of steel. Water tube boilers manufactured by the Oil City Boiler Works, of Oil City, Pa., and Bullock generators and dynamos, will be used. The machine shop equipment will be furnished

by the Brown & Zortman Machinery Company, of Pittsburg, while Pawling & Harnischfeger, of Milwaukee, Wis., will install a 6-ton traveling crane. All the machinery will be electrically driven. It is the intention of the company to build engines from 50-h. p. to 100-h. p. The chief parties interested are C. H. Bradley, Jr., and J. H. Bailey, both of Pittsburg, and D. J. Geary, of Oil City, Pa.

The United States Shipbuilding Company has purchased the Bethlehem Steel Company. The control of the Bethlehem Company has rested since last year with the firm of J. P. Morgan & Company, under an arrangement with Charles M. Schwab, president of the United States Steel Corporation. The plans for the United States Shipbuilding Company have contemplated an authorized capital stock of \$20,000,000 and \$16,000,000 of 5 per cent first mortgage bonds. The company is to unite the following shipbuilding concerns: Union Iron Works, San Francisco, Cal.; Bath Iron Works, Limited, and Hyde Windlass Company, Bath, Me.; Crescent Shipyard and Samuel L. Moore & Sons' Company, Elizabethport, N. J.; Eastern Shipbuilding Company, New London, Conn.; Harlan & Hollingsworth Company, Wilmington, Del.; Canda Manufacturing Company, Cartaret, N. J. The directors, it has been announced, will include Henry T. Scott, John S. Hyde, E. W. Hyde, Lewis Nixon, Charles R. Hanscom, Irving M. Scott, Charles J. Canda, Horace W. Gause, Daniel LeRoy Dresser and J. J. McCook. The Bethlehem Steel Company was incorporated in Pennsylvania on April 17, 1899. Its capital stock amounts to \$15,000,000, divided into shares of \$50 each, on which \$1 has been paid in.

TRADE CATALOGUES.

The Central Electric Company, of Chicago, Ill., has issued an illustrated price-list of 176 pages, describing the electric supplies that it carries in stock. The catalogue is neatly printed, and has a good index.

The Crocker-Wheeler Company, of Ampere, N. J., issues a little pamphlet on its small power motors, ranging from 1-25 to 35 h. p. The company entitles these small motors its "bread winners," and constantly keeps a full line of them in stock for immediate shipment.

Catalogue A, of the Wyoming Shovel Company, of Wyoming, Pa., is a pamphlet of 56 pages, describing the shovels, spades and scoops the company manufactures. These implements have as their distinguishing feature the Pettibone back-strap, which, it is stated, will stand more prying, straining and heavy work than any other back-strap made, while it is so attached to the sides of the socket formed in the blades that it is entirely out of the line of wear. The list of shovels and scoops shown in the catalogue embraces patterns used in both Eastern and Western mines.

The Industrial Press of New York City has published Section A of its Mechanical Index, covering machine tools and metal-working machinery. This section is to be followed by others covering wood-working machinery, electrical appliances, steam appliances, etc. The various sections when issued are to be bound in one book of about 600 pages intended to be an encyclopaedia and list of manufacturers in the United States of mechanical appliances and tools operated by steam, electricity, water, air, hand or foot power, with sub-headings for quick reference. The first section is neatly printed, and if the work is carefully carried through on the lines indicated, it should prove of much value to manufacturers and others.

The Macomber & Whyte Rope Company, of Chicago, Ill., has just issued catalogue B for 1902 which gives complete information with reference to the various grades of wire rope manufactured by the company. The company also manufactures the Hallidie tramway, and this specialty is also described and illustrated. Catalogue B also contains lists of wire rope fixtures, wire rope sheaves for the transmission of power, hoisting sheaves, wire rope blocks, etc. A complete table covers transmission of power by wire rope, and "How to Splice Wire Rope" is fully described. The company's factory is located at Coal City, Ill., and the company reports great success in its manufacturing business. This is particularly true with reference to the "Monarch" brand rope largely used by mines, quarries, dredges, contractors, and in fact everywhere that a strictly high-grade rope is required.

Jeffrey screening machinery for ores, rock, coal, clay, chemicals, Portland cement clinker, phosphate rock and acid phosphate, fuller's earth, bone-ash, etc., is described in a standard size 48-page pamphlet published by the Jeffrey Manufacturing Company, of Columbus, O. The principal device shown is the Jeffrey Columbian separator and vibrating screen, which is made with one, two, three or four screening surfaces. Plans are given, showing arrangement of screens, pulverizer, crusher and elevator, for right or left-hand plants. The screens used are from 3 to 100 mesh. The company states that the machine has a very large live screening surface, and its product is uniformly fine. The capacity depends upon the material handled, and will run from 500 lbs. to 40,000

lbs. per hour. The machine is regularly built in 4 sizes, specifications of which are given. A long list of users and many testimonial letters are printed in the pamphlet.

Reynolds-Corliss engines made by the Allis-Chalmers Company, at the Edward P. Allis Works, Milwaukee, Wis., are shown in a finely illustrated booklet of 182 pages that is sent out by the company. The company aims to meet all the requirements of modern practice and makes vertical, horizontal and combined vertical and horizontal Corliss engines in full variety. The horizontal engines are built in two types, girder frame engines for all ordinary service where steam pressures do not exceed 100 lbs., and the 1890 type engines for the severe service of rolling mills and electric street railways. The company guarantees these engines to operate continuously under a steam pressure of 140 lbs., and in any service. The company states that all materials used are subject to rigid tests. Bronze castings are used for valve stems and all other places where that metal is required. Piston rods, connecting rods, crank and cross-head pins are made of steel. Bolts and studs are of double-refined iron or mild steel. Main journal bearings, cross-head shoes and crank-pin brasses are faced with genuine babbit. The specifications of different sizes of engines are given in the pamphlet. The illustrations show, among other types, direct-connected engines, tandem and cross-compound, vertical and combined vertical and horizontal direct-coupled engines, also steam and belt-driven horizontal and vertical air compressors, rolling mill engines, blowing engines, hoisting engines, pumping engines, mine pumps, etc. The pamphlet shows some famous power stations at which Reynolds-Corliss engines have been installed. These include stations in this country, England, Australia, Spain, Germany and Argentina.

GENERAL MINING NEWS.

Mineral Oil Exports.—In May the United States exported 11,525,352 gals. crude oil, 2,494,358 gals. naphthas, 64,987,139 gals. illuminating oil, 6,731,124 gals. lubricating and paraffin, 2,898,714 gals. residuum: total, 88,636,687 gals., as against 97,486,567 gals. last year, showing a decrease of 8,849,880 gals. In the 5 months ending May 31 the total exports were 423,655,300, as compared with 409,254,492 gals. in the corresponding period last year; showing an increase of 14,400,808 gals. or over 3 per cent., principally in illuminating oil.

ALASKA.

JUNEAU DISTRICT.

Nowell.—This company, on Berners Bay, now in the hands of receivers, may be taken over by the Mine Securities Corporation, of New York City. The sum of \$25,000 has been paid Receiver B. M. Behrends by Boston bondholders to satisfy local creditors, according to a Seattle paper. The new company to be organized by the Mine Securities Corporation will have a capital stock of \$5,000,000, of which \$2,000,000 goes to the Nowells for their holdings, if the agreement is carried out, and this will release their interests in the property; \$350,000 goes in two payments to the bondholders, and \$190,000 to pay the receivers' certificates, and \$400,000 in two payments to the treasury of the new company, the name of which is not yet made public. The first part of the deal will have to be closed by January 1, 1903, and the entire deal closed by June 30, 1903. The agreement calls for the Mine Securities Corporation, of New York, to pay \$5,000 cash to the receiver upon the signing of the agreement, for which the receiver issues certificates drawing 8 per cent interest; \$5,000 more is to be paid on demand of the receiver, for which certificates drawing 8 per cent interest are again issued. The \$10,000 thus issued is to be used in continuing the tunnel to the Eureka lode. The Mine Securities Corporation may then take the property, if it elects to do so, without further development work; or may put up \$15,000 in addition for development purposes; but on or before January 1, 1903, it is to elect to take the property or not. If it elects to take the property it is to pay off the entire receivers' indebtedness in cash, amounting to \$190,000 and interest, pay the International Trust Company, of Boston, \$175,000 on the mortgage bonds, and into the treasury of the new company \$200,000. On or before June 30, 1903, it is to pay to the International Trust Company an additional \$175,000 on mortgage bonds, making a total of \$350,000 on the bonds, and at the same time will provide for the treasury of the new company an additional \$200,000, making a total of \$400,000.

The bondholders put up \$25,000 for payment on the local receivers' certificates to get the agreement signed.

Sheep Creek.—A deal for these quartz mines, back of Juneau, is reported nearing completion. Associated with Portland, Ore., men are Eastern capitalists. The sale involves the purchase price of \$350,000 for certain mining properties on Sheep Creek. Of this sum the terms stipulate the payment of \$50,000 cash, \$100,000 at the expiration of the first

year's development and \$100,000 at the end of the second year, with \$100,000 as a final payment. One of the principal promoters of the sale is John F. Maloney, of Juneau.

ARIZONA.

GRAHAM COUNTY.

Arizona Copper Company.—This company reports that the production of copper from its mines at Clifton for the month of May was equivalent to 1,284 tons of 2,000 lbs.

MOHAVE COUNTY.

(From Our Special Correspondent.)

Alpha.—Mrs. Mary E. Baldwin has sold this claim in Oro Plata District to Los Angeles men.

Great West.—Ed. Toby has a 2-stamp mill busy at this mine in Weaver District.

King.—This mine, at Mineral Park, is showing some very rich ore in a 2-ft. vein.

Levy Brothers.—This company, at Signal, has the 50-ton concentrator running on lead-silver ores. Lack of water precludes full time.

Maguire.—This mine, 4 miles west of Kingman, was recently sold to a California company, which has several men driving a tunnel in free milling ore. A small mill will be erected.

Merrimac.—The machinery of the 20-stamp mill and steam hoist of this mine in Wallapai District is soon to receive an overhauling.

New Company.—This Los Angeles company that recently purchased some free milling claims from the Richardson Brothers, at Union Pass, has about 30 men at work.

Schulykill.—This mine, in Wallapai District, closed down June 1, and D. W. O'Neil, the superintendent, has returned to Pittsburg, Pa. The veins of milling ore were small.

Shasta County Smelting and Refining Company.—This California company is erecting a 50-ton smelter at Chloride. The 70-h. p. boiler is in place. The sampling room is 16 by 30 ft., blacksmith shop 16 by 20 ft. A large dust chamber will be put up. A bunkhouse and assay office is already up. A gasoline pump is ordered to handle the water from the new well. The company will buy and sample ores. Thomas Neilson is assayer. The plant will blow in July 1.

Virginia.—Ben Hastings, superintendent of this mine in Weaver District, has returned to his company headquarters in Chloride after starting 6 men at work. The shaft is 200 ft. deep.

CALIFORNIA.

(From Our Special Correspondent.)

Ballard & Martin.—On this claim, at Plymouth, C. D. Lane and W. I. Smart are shortly to erect a hoist.

Crown Point.—Walter I. Smart, of Placerville, associated with C. D. Lane, of Angels, is unwatering this mine, near Plymouth.

Illinois.—Dr. Boyeson has uncovered rich ore in this claim, north of Plymouth.

Kennedy Mining and Milling Company.—In this mine, at Jackson, J. F. Parks, superintendent, the east ledge has been cut in the drift west from the new shaft. It is smaller than in other parts of the mine, but higher grade.

Live Oak.—This mine, near Defender, being worked by Trackwell & Harmon, shows very encouraging prospects. A test crushing showed values of \$20 per ton in free gold.

CALAVERAS COUNTY.

(From Our Special Correspondent.)

Angels.—The mill at this mine, at Angels, James V. Coleman, of San Francisco, owner, will soon be ready to run by electric power. The hoist will be run by air and the compressor by steam.

Benson Mining Company.—This company, at Angels, John C. Benson, president, is operating the Benson Mine, adjoining the Gold Hill, which has not been worked for many years. Good milling ore is being taken out, and machinery is being purchased.

Ortolo.—A strike is reported in this mine, at Angels. J. H. Heard is superintendent. The new compressor is at work.

Sloan & Rudorff.—This hydraulic mine, at Vallecito, is running a full crew.

DEL NORTE COUNTY.

(From Our Special Correspondent.)

Platinum Finds.—A large number of mining claims have lately been taken up on the South Fork of Smith River, about 20 miles from Crescent City. On the North and Middle Forks fewer claims have been located. The men working along the river are making wages getting out gold, and are saving the black sand, which is rich in platinum and allied metals. Considerable gold is found in the concentrated black sand, showing that the miners were unable to save it all. The sands prospect very much higher in platinum

than the ordinary black sands in California; in fact, some of the concentrated samples of the sand are exceptionally rich, running up into the hundreds in value of platinum and iridium per ton. Only a few of the claims are so far worked.

ELDORADO COUNTY.

(From Our Special Correspondent.)

Eureka Slate Quarry.—The new compressor for this quarry at Kelsey has been hauled in.

Goconda.—This mine, near Rescue, owned by the Golden Gate Mining Company, of Bridgeport, Conn., is being developed by a tunnel now in 400 ft.

FRESNO COUNTY.

(From Our Special Correspondent.)

Paradise.—T. B. Matthews and M. Sides, of Selma, have started work on this mine on Sycamore Creek.

HUMBOLDT COUNTY.

(From Our Special Correspondent.)

Big Lagoon.—At this place the float for a new dredger has been launched, and machinery is being put aboard.

Gold Bluff.—H. D. Munson, manager of this beach sand mine, has the float for his 80-ft. dredger in course of construction.

Orleans Bar Gold Mining Company.—This mine, at Orleans, H. DeC. Richards, general manager, is running full capacity by the hydraulic process.

KERN COUNTY.

(From Our Special Correspondent.)

During May the Kern District petroleum fields shipped 500 car-loads more oil than in April, a record month for the district.

Abandoned Mines Reopened.—A number of old mines, near Keyesville, idle for 30 to 40 years, are being reopened. Jose Gonzales is working a small but rich seam. The Three Chimneys, once a large producer, is to be developed under bond. The French Doctor has been reopened by James Keister, who is milling good ore. The Keyes, recently bought by Col. James Spillacy and the Bank of Sacramento, is turning out much better than was hoped for. This district was first worked for placers.

Buena Piedra.—At this mine, at Granite station, about 20 miles from Bakersfield, 2 drifts are being run from the shaft, a Huntington mill put up, and the old machinery replaced. Those interested are mainly oil men, C. A. Barlow, H. T. Austin, A. W. McRea, F. P. Hoy and C. T. Tryon, and superintendents Craven, of the Queen Oil Company, and Scott, of the Golden Rod, all of Bakersfield.

Golden Peak Mining Company.—This new company, organized by H. H. Blood and J. R. Martin, of San Francisco, is about to open 7 claims at Caliente. Men are at work prospecting the claims.

Green Elephant.—On this mine, near Mohave, a 40-ton mill is to be installed.

Keyes.—Col. James Spillacy, manager of this mine, at Keyes, has been served with notice to quit cutting wood on the forest reserve. The wood in that section is scrub timber. Temporary permission was given to cut until another supply could be obtained.

Lady Belle.—This mine, at Keyesville, one of the Big Blue group, has started after many years' idleness.

Mendora Mining Company.—This Los Angeles company, owning the Polka Dot Mine, at Vaughn, is taking out ore enough to keep the 5-stamp mill running.

MONTEREY COUNTY.

(From Our Special Correspondent.)

Los Burros District.—In this old district, 42 miles from Kings City and 12 miles from Jolon, there are 80 men at work. The district has been practically idle for some years, but now a number of ledges are being prospected. S. O. Pew is putting up a mill. The Ralston Mining Company is about to erect mills. Some of the surface ground is being sluiced or hydraulicked. The Alice Mining Company, a Santa Clara organization, with Robert Menzell as president, intends doing considerable development on several claims.

NEVADA COUNTY.

(From Our Special Correspondent.)

Central Shaft.—At this mine, operated by the North Star Mines Company, A. D. Foote, manager, heavier machinery is to be installed.

Grey Eagle.—This property, at Maybert, is to be developed by a newly organized company, of which H. Kahler is superintendent, and S. T. Allen president. A 10-stamp mill has been purchased.

Meadow Lake Mill.—Capt. Nihell is to rebuild the quartz mill, in Meadow Lake District, which was blown down last year.

Middle Yuba Development Company.—Richard Phelan, of Sierra City, has taken a number of miners to new quartz and gravel claims near Nevada City. These mines are 2½ miles from Milton Dam, on the Middle Yuba River.

New Independence.—At this mine at Moore's Flat, Charles M. Root superintendent, the new hoist is completed, and the 8-stamp mill is steadily running. The new owners are pushing work systematically.

Pine Hill.—New machinery is being placed at this mine at Wolf under direction of Cerf Rosenthal. The mine is in progress of development.

SACRAMENTO COUNTY.

(From Our Special Correspondent.)

Prosperity.—At this mine, near Folsom, E. B. Bullock, of San Francisco, manager, a gasoline engine and centrifugal pump are in place and the gallows frame for the hoist is going up. The company has re- timbered the old shaft of the Blue Ravine Mine, and will drift north from that. I. Cohn, of Folsom, organized the company, and is one of the principal owners.

SHASTA COUNTY.

(From Our Special Correspondent.)

Inca-Treasure Gold Mining Company.—This company has been organized to open and work the Pioneer-Black Oak group, 6 miles west of Bayles, and the first payment of \$5,000 has been made. The officers are J. W. Girdner, president; S. T. White, secretary; M. E. Dittmar, managing director, of Redding; T. J. Finch and J. W. Keegan, of Santa Rosa. It is proposed to work the mine on a large scale.

Mount Shasta Gold Mines Corporation.—This company, at Shasta, A. S. Gabbs, superintendent, has the new steam hoist in place, and the compressor ready. This company also owns the McClure group of copper claims, near Winthrop, and is considering building a smelter. A number of the larger stockholders are visiting the mines, among them H. S. Gillette, E. Nicodemus, H. C. Williams, D. P. Phelps and A. L. Burkowet, of Chicago; Dr. T. Gillespie, of Kenosha, Wis.; Dr. J. P. Schouffele, of Charleston, W. Va., and E. E. Vincent and W. W. Gillam, of Goodland, W. Va.

Oro Fino.—A company of Berkeley men is to work this group of mines near Reading. The directors are J. T. Mabey, president; W. C. Jenkins, secretary; J. F. Schnoor, Charles Merchant and William Moran, the latter of Redding.

SIERRA COUNTY.

(From Our Special Correspondent.)

Belleview Mining Company.—This company is operating the Thistle Shaft, or Feather Fork property at Gibsonville under the management of C. B. Wingate. The tunnel is in 2,700 ft. in hard slate, and will not be completed before next March. A fine wagon road has been built from the mine to La Porte. Two air drills are used in the tunnel.

Mabel Mertz.—Two shifts are working in the tunnel of this mine, near Forest. H. B. McCormick is manager. It will take about 5 months' more work to reach the gravel channel.

Tabor.—The tunnel at this mine, near Gibsonville, is in about 3,500 ft., making good progress, and should reach the channel in about 500 ft. The mine is owned by Massachusetts men. E. Squier is foreman.

White Bear.—At this mine, near Monte Christo, William J. Belcher, manager, 9 men are opening the channel. A number of new buildings are going up.

SISKIYOU COUNTY.

(From Our Special Correspondent.)

Greenhorn.—It is reported that this gravel mine, near Yreka, will be worked again shortly.

Jordan.—This mine, at Cecilville, is running steadily. A new bedrock cut is being made at the lower end of the bar to open a large body of ground.

Kelly.—The mill at this mine, near Gottville, has been repaired.

Salmon River.—At this hydraulic mine, near Sawyer's Bar, C. S. Fitch, superintendent, the new hydraulic elevator is working satisfactorily.

Tyrer Mill.—C. W. Tyrer & Co. are running their mill steadily near Hornbrook, and adding hoisting and other machinery.

SONOMA COUNTY.

(From Our Special Correspondent.)

Healdsburg Quicksilver Mining Company.—This organization, promoted by F. A. Kruse and J. C. Hobson, is to work a new quicksilver claim on the Wah farm, 10 miles from Healdsburg. Work has started.

TUOLUMNE COUNTY.

(From Our Special Correspondent.)

A bad break in the Tuolumne County water ditch has shut off the power from the Rawhide, Jumper, Dutch, App, Harbert, Crystalline, Soulsby, Black Oak and Draper mines for a week or more.

Bell.—This mine, near Tuttle town, has started up again.

Olio.—This mine, at Chinese Camp, has been taken by the Pioneer-Lynn Mining Company, with A. P. Chittenden as superintendent.

Eagle Bluff.—Winslow Hubbard, of Groveland, has bonded to Grant Hawthorne, of San Francisco, this mine, on the Tuolumne River.

Longfellow.—Dr. J. L. D. Roberts, of Monterey, owner of this mine at Big Oak Flat, has a good force of men employed. The mill has recently been crushing ore from the Nonpareil Mine.

Republican.—At this mine, near Chinese Camp, B. Deleray, superintendent, a 10-stamp addition is to be made to the mill and a chlorination plant erected.

Sisty Leasing Company.—This company is preparing to put in a cyanide plant at the Soulsby Mine, Soulsbyville.

Treasurer.—This group, on Red Gulch, near Sonora, is being opened by A. M. Squires, of Los Angeles. A 200-ft. shaft is to be sunk at once.

COLORADO.

CHAFFEE COUNTY.

Smuggler and Washington.—Colorado Springs men have purchased these mines at Granite, and have organized the Washington Gold Mining Company. The officers and directors are: President, C. C. Hamlin, vice-president, C. E. Noble; treasurer and general manager, C. E. Stubbs; superintendent, G. T. Martin, and J. M. Parker, director. The properties embrace 20 acres on the west slope of the Mosquito Range, 2 miles east of Granite and 18 miles south of Leadville, and contain 3,000 ft. of the famous Washington vein. The shaft will be sunk to 500 ft.

(From Our Special Correspondent.)

Among the properties in the district on which active developments are being pushed are the Twin City, the Anaconda, the Jasper, the Independence and the Viandiere, and plans are under way for the opening of the Mascot Group.

Last Chance.—This mine, at Whitehorn, is reported sold to John McConaghy in the interest of the Colorado Consolidated Mines Company. Among the other leading mines of the district are the Cleopatra, the Bruce and the Little Johnny.

Turret District.—This district is to be developed by a tunnel to cut the Holdrege vein at about 800 ft. The present length is 350 ft. The general course will be through Harper Hill and under Pontiac Gulch and Gold Hill.

CLEAR CREEK COUNTY.

(From Our Special Correspondent.)

Covode Mountain Mining Company.—This company at Empire is applying for patents on a group of 11 lode claims. A deal is understood to be under way for the consolidation of this with the Empire Tunnel which is driving for the same sulphide belt to the north. The Gold Dirt Mine of the Empire Company is producing high-grade mineral and will be cut by the tunnel at a depth of over 2,000 ft.

Rara Avis.—It is reported that the parties holding an option on this group in Eureka District are preparing to work the property. It is owned by Philadelphia men, and some good ores were once taken out.

Tucker.—Some excellent lead ores are being shipped to the Denver smelters, carrying average values of between \$50 and \$100 per ton, while the Rocky Mountain concentrator is treating a large tonnage of lower grade. The shaft is down 450 ft., and the Lyons-Kyle Mining Company intends to sink still deeper. The property was recently purchased by Chicago parties, and promises well. W. Wood, Central City, is manager.

EAGLE COUNTY.

(From Our Special Correspondent.)

Union Gold Mining and Reduction Company.—This company is receiving bids for sinking a shaft 200 ft. and driving 400 ft. of drift.

GILPIN COUNTY.

(From Our Special Correspondent.)

Bant.—Nebraska parties owning this claim near Black Hawk will install a fair sized plant of machinery in a 20 by 50-ft. shaft house. G. D. Johnstone, Black Hawk, is in charge.

Boodle.—The Scotch owners of this property in Eureka District have cabled orders to sink the main shaft, now 300 ft. deep, and will carry on active development. W. J. Richards, of Central City, is manager.

Coeur d'Alcne.—Milwaukee men, represented by J. F. Schouer, have secured a lease and option on this property on Gunnell Hill, and are overhauling the machinery under the superintendency of John Mackey, of Central City. The shaft is down 600 ft., and the lessees will sink 100 ft. at once. The property is credited with a past production of \$100,000.

Electric Spark Gold Mining Company.—Developments have started at the Grace Darling property in Lake District, and the 100-ft. shaft is to be sunk deeper. Shipments are made to the Golden Smelter. The ores carry assay values of \$21 in gold

and 6 oz. silver per ton. J. C. Martin, of Black Hawk, is agent. The company may decide to install a hoist soon.

King.—The Nevada Consolidated Company in doing development in the upper levels has opened some iron ores which assay over \$60 per ton. The ores have usually run in silver and lead, and the find is the more welcome. G. C. Moore, of Central City, is manager.

Lambert-Johnson.—Charles Sanderlin has leased and bonded this property to Denver men, who will start work at once. The property is the eastern portion of the well-known Kansas vein.

Owatonna.—Local parties have a lease on this property, on Pewabic Mountain, and are shipping to the Golden Smelter. The ores formerly gave values of \$50 per ton, carrying considerable galena.

Susquehanna.—Eastern men have secured an option on this group of 6 claims and on 24 claims adjoining. The Susquehanna shaft, 200 ft. deep, has produced some splendid lead and silver ores. Operations will be carried on through the shaft and the cross-cut tunnel started. H. B. Stone, of Buffalo, N. Y., will be manager, with headquarters in Central City.

Town Topics Gold Mining Company.—Developments are started to cut the ore shoot opened in the 488-ft. level, where the ore carries nearly 15 oz. gold per ton. The company has also begun developments in the Vivian shaft and opened some very fair ore in the 250-ft. level. A heavy plant of machinery is to be installed and possibly an electric hoist. M. D. Draper, of Central City, is manager.

GUNNISON COUNTY.

(From Our Special Correspondent.)

Brunswick Mining and Milling Company.—This company is operating the Jimmy Mack Mine at Tin Cup, and looks for satisfactory returns from the old property.

Gold Cup.—Mr. J. L. Johnson is developing this mine at Tin Cup.

HINSDALE COUNTY.

(From Our Special Correspondent.)

Hidden Treasure.—Work has resumed on this mine and mill.

LAKE COUNTY—LEADVILLE.

(From Our Special Correspondent.)

Leadville Ore Output.—The output averages 2,250 tons daily, made up mostly of iron, and iron and lead sulphides. There is a material increase in the zinc tonnage.

Smelter Situation.—The American Smelting and Refining Company plant, the Arkansas Valley, is running full capacity, handling over 1,000 tons daily. Important improvements planned will enable it to handle a greater tonnage. The New Jersey Copper Gold Reduction Company expects to have its furnaces going this week at the old Harrison Reduction Works. The Robinson Smelter, at Robinson, which closed temporarily, will resume this week and handle 150 tons daily. The Buena Vista Smelter has secured a tonnage from the Mike & Starr and resumes this week. It is reported that the Rocky Mountain Smelter at Florence will likely be leased and resume operations early in July, while the new Colorado & Ohio Smelter at Salida will shortly have some of its furnaces going.

A. M. W. Combination.—This consolidation, including the Adams, Maid and Wolfone, the A. Y. and Minnie and the Mahala, has passed into the hands of New York men, who have purchased for \$500,000 the interests held by local people, except the interests of S. D. Nicholson and Julius Rodman. The former remains as general manager, and the latter as financial manager. Mr. Rodman has tendered his resignation as manager of the Arkansas Valley Smelter. The combination is to handle in greater quantity low-grade sulphide ores, and, it is announced, by milling and smelting, will increase its tonnage before the close of the year to fully 700 tons a day. The new mill at the A. Y. & Minnie will be completed as soon as possible and started on the low-grade ores, while the new shaft on the Mahala will be sunk to tap the immense sulphide shoots of Carbonate Hill and Graham Park. The entire territory has for years been producing, much of the ground having been developed only above the 400-ft. level, and there are immense ore reserves in the lower contacts yet. The handling of the low-grade sulphides will be of greatest importance to the district, and the new company with its large acreage and capital will be able to develop the territory most advantageously.

Abe Lincoln Mining Company.—This new company, which owns the Abe Lincoln, Ida May and Dewey claims, in Lake Park, will resume work this week. It has 50 acres, and work done through the Ida May has developed a good vein.

Chippewa Leasing Company.—Some fair grade gold ore is taken out, but only streaks have been encoun-

tered. Sixty thousand dollars have been spent in development.

Last Chance.—This property, on the same vein as the Hilltop Mine, is under lease to local men, headed by T. S. Schlessinger. There are some 10,000 tons of ore in sight, with one stope 50 ft. wide and 300 ft. high. The stuff is a low-grade lead-iron sulphide, and arrangements are under way for the erection of a concentrator.

Louisville.—The property has been idle some months, but will resume shortly, as there is a brisk demand for the zinciferous material in the old Louisville workings.

M. N. Fraction.—This claim will probably soon be leased. It lies near the Ibex and has produced heavily. Large bodies of low-grade sulphides are exposed.

New Monarch Mining Company.—A large force is blocking out sulphides. The new smelter will be able to blow in some stacks within 6 weeks, so shipments of 250 tons a day will soon start.

Ohio Mining Company.—A new shaft is started on the Ohio claim. The surface showing is good. The old shaft is considered badly located.

Penn Mining Company.—Shipments average 50 tons a day of siliceous gold ore, going 1 oz. gold. Extensive prospecting is under way.

Progressive Mining Company.—This company, under the management of W. L. Cooper, has a heavy water flow in the new shaft, and has ceased work until a pump is put in.

Resurrection Gold Mining Company.—One hundred and 50 tons a day are coming from the 1,000-ft. level, principally sulphide ore. No. 1 shaft is down 1,100 ft., after the lower sulphide zone. The water is handled by the big plant on No. 2 shaft.

Sedalia.—Arrangements are on foot for a resumption after an idleness of some months. There are large bodies of low-grade ore exposed in these workings, which adjoin the Resurrection No. 1 shaft.

MESA COUNTY.

(From Our Special Correspondent.)

Western Slope Copper Mining and Smelting Company.—It is announced that H. H. Marden, president of this company, will erect a smelter at Grand Junction for the treatment of copper ores from Unaweep and other Western Slope districts. The company controls 5 claims at Unaweep. The Mollie Brooks has extensive developments, including a tunnel over 300 ft. in.

SAN MIGUEL COUNTY.

Tomboy Gold Mines.—This company, at Pandora, is being equipped throughout for electrical power distribution. A recent purchase from the Westinghouse Electric and Manufacturing Company includes a number of induction motors, reducing transformers, "low-equivalent" lightning arresters with choke coils and high-tension circuit breakers.

(From Our Special Correspondent.)

Liberty Bell Gold Mining Company.—This company has nearly completed the mine buildings, which are much more substantial than those destroyed by the snow-slide last February. The new dining room is 55 by 28 ft.; the kitchen, bake shop and store rooms adjoining are 50 by 31 ft. The new bunkhouse is 76 by 20 ft. The old bunkhouse, the only building left standing after the slide, has been repaired. The 70 by 70 ft. building at the mouth of the tunnel will include store rooms, timber shed, small tram terminal and blacksmith shop. The new ore bin building is 40 by 30 ft., and the upper terminal of the tram is 76 by 24 ft. A large crib to turn the course of future slides is now 80 ft. long, 12 ft. wide and 14 ft. high. It will be materially strengthened during the summer. A small tram from the large one to the mouth of the tunnel is under construction. It will be 500 ft. long. By it timbers will be unloaded at the carpenter shop, framed, loaded on trucks and taken into the mine with very little trouble. Power will be furnished by the large gravity tramway. The property is worked at full capacity; 80 stamps in, treating nearly 300 tons of ore daily. The capacity of the cyanide plant has been increased, and can handle all the tailings before they are treated by the canvas table plant.

Ophir Consolidated Mining Company.—This company at Ophir is steadily driving the mill cross-cut tunnel. The extension of the noted Ida vein has been intersected in the 6th level, the lowest of the upper workings. Machine drills will be used to develop this vein and afterwards installed in the tunnel. The Ida vein was worked for several years by the Butterfly-Terrible Company, and is said to have been the most profitable vein in that group. Grading for the new addition to the mill is progressing rapidly. W. S. Buckley, the manager, has been in Milwaukee, Wis., at the home office of the company.

Sheridan.—The Sheridan dump, in Marshall basin, with 3 other dumps, has been leased to Thomas Elliot and William Morrison by the Smuggler-Union

Mining Company. A 10-stamp mill is being erected. The plant will be equipped with plates and vanners. For many years the dumps have been worked by the Smuggler-Union Company, and the ore milled at Pandora, yielding good profits. Messrs. Elliot and Morrison have had a lease on the Sheridan dump on the Telluride side of the range, and have run a 10-stamp mill summers for several years. They will employ about 20 men, and Thomas Elliot, Telluride, will be manager.

TELLER COUNTY—CRIPPLE CREEK.

An accident to the La Bella compressor plant at Goldfield has resulted in the suspension of machine work at a number of mines dependent on that plant for air. The cylinder head of the compressor blew out and the plant was badly wrecked. It is estimated that it will be 2 weeks before the necessary part can be obtained from Eastern manufacturers. Fully 90 machine drills in different mines were supplied with air from this plant. The properties that will suffer the most are the Golden Cycle, Findley, Hall City, Placer, Mary Cashen and a number of smaller mines. It is estimated that nearly 1,000 miners have been affected by the accident.

Chicolo Consolidated Gold Mining Company.—This company has been formed as the result of a consolidation of the Hard Carbonate, Avalon, Chicolo and Helen B. companies, controlling a total of 191 acres on Tenderfoot Hill. The company will be capitalized for \$3,000,000, divided into \$1 shares. The treasury reserve will contain 900,000 shares, part of which will be sold for development fund. The Hard Carbonate Company will receive 350,000 shares of the new stock, the Avalon 610,000, the Chicolo 640,000 and the Helen B. 500,000 shares, making a total of 2,100,000 shares issued. D. N. Heizer, W. S. Harwood and Thomas May were instrumental in forming the consolidation.

Telluride Mill.—This mill at West Colorado Springs has started up with an initial capacity of 300 tons daily. A full tonnage is guaranteed for months ahead.

(From Our Special Correspondent.)

C. K. & N. Company.—At the annual meeting this week the control passed to clients of Horace Granfield. Out of the total outstanding capitalization of 1,500,000 shares, 1,003,400 shares were represented. The following directors were elected: Isaac L. Goff, of Denver; J. Frank Braids, of Providence, R. I.; J. C. Anderson, of Denver; W. H. Davis, of Denver, and K. MacDermid, of Colorado Springs.

Mr. Granfield owns the lease on the Raaler claim, and will probably be granted an extension, as he has done a large amount of development. The company is in strong hands, and its affairs will undoubtedly be managed in the interests of all the stockholders.

Engineer.—Work has started on this claim on Guyot Hill by a local leasing company that recently secured a 2-year lease. The claim is owned by the Currency Company, and has been prospected to a limited extent. Only 52 shifts a month are called for, and the royalty is placed at 20 per cent flat.

La Belle Company.—A piece of metal dropped into the steam chest of the compressor, and both cylinder heads were blown out. The connecting rods and piston rods were badly bent and broken, and the big machine is so badly damaged that it will take a couple of weeks' time to make the necessary repairs. The Golden Cycle will be obliged to suspend ore breaking for a couple of weeks. But there is enough ore already broken in the drifts to keep the output at between 100 and 125 tons a day.

Vindicator.—At 900 ft. the Lillie-Vindicator vein has been opened. The vein will be explored for this shoot in the 1,200-ft. level, which is the next below, and also at the 1,300-ft. point.

The shaft is down 1,400 ft., but owing to water little exploring has been done at that depth. A new pump with a capacity of 500 gal. against 200 ft. head has been ordered, and will shortly be installed. J. C. McCormack has been appointed superintendent in place of Mr. Holman.

A re-survey of Cripple Creek is talked of. President Burns, of the Portland, and President Donaldson, of the Colorado Springs Mining Exchange, are in favor of it. President Burns says that "the only good derived by the camp from anything that might be termed an expert source was the Government geological survey of the district made in the summer of 1894 under the direction of Prof. Whitman Cross and Richard Penrose. It would be wise if the mine owners, the mining exchanges and the chambers of commerce of the Cripple Creek District and Colorado Springs would petition Congress to have the same gentlemen to make another and more detailed survey."

GEORGIA.

DOUGLAS COUNTY.

(From Our Special Correspondent.)

Durges.—This pyrites mine, located 3 miles north-east of Villa Rica, has been purchased by the Virginia-Carolina Chemical Company, which is constructing a

branch railroad from Villa Rica to the mine. When the railroad is completed and the new mining machinery being installed is ready the mine will have a capacity of about 200 tons of pyrites per day. The ore body varies from 3 to 12 ft. in thickness, and can be traced along its outcroppings for a mile or more.

HARRALSON COUNTY.

(From Our Special Correspondent.)

Philips.—O. M. Stinson, of Chicago, has recently secured an option on this property near Bremen, and is prospecting with a diamond drill. W. H. Blake, superintendent of the works, reports a large vein of pyrites cut at about 200 ft. from the surface, though the ore is not very high grade.

POLK COUNTY.

Rockmart Slate Company.—This company, with a capital of \$20,000, is now producing slate from its quarries at Rockmart. In addition to roofing slates, the company will also produce general mill stock, including tilings, etc. C. R. Haskins, general manager for the company, has offices in Atlanta.

IDAHO.

BLAINE COUNTY.

Liberal.—At this mine, near Hailey, an incline from the main tunnel is down 200 ft. Crosscuts at 100 ft. down are reported in good ore.

IDAHO COUNTY.

Atlas.—Spokane, Wash., men are reported to have purchased a half interest in this group of 6 claims at Hump owned by W. E. Parisot.

Cracker Jack.—W. A. Stevens has resigned as manager of the Big Buffalo Mine to take charge of this mine at Hump, of which he is part owner. The mill is about to start with 5 stamps, but 5 more stamps have been ordered.

Wise Boy.—There are 25 men getting in the 10-stamp mill and sawmill for this mine at Hump. The mill is expected to start work by August 1.

(From an Occasional Correspondent.)

Thunder Mountain District.—The much-discussed Thunder Mountain boom is fairly under way. The Salmon City and Challis roads, which converge at Singiser, have been open for pack animals over a month, all other roads at this date, June 1, still blocked either by snow or high water. Marble City, at the east base of the mountain, has about 30 tents and 75 people. Roosevelt, at the west base of the mountain, has 12 tents and cabins, and a population of not to exceed 30 people. About 30 more are at the Thunder Mountain townsite on the west fork of Monumental Creek. The Dewey Mine is employing about 8 men all told, and there are probably 100 others scattered through the hills.

The general impression among some very conservative mining men now in the district is that there is nothing whatever so far developed to justify the boom; that it is the most overestimated district that has ever been foisted on the public, and that there will be quite a string of disappointed investors, who paid fancy prices and forfeit money, when they have had a chance to examine their claims.

There has been nothing of definite value developed on any group of claims in the district so far, outside of the Dewey group, and it is considered by some that the Dewey itself has not developed a pay-ore capacity in excess of its present equipment, which consists of a 10-stamp mill.

I consider it a little too early yet to pass a definite opinion on the district, as the higher hills including Thunder Mountain are still capped with snow. Free gold can be panned from the surface soil over an area several miles square around Thunder Mountain. The district shows igneous rocks entirely for fully 10 miles square, but these are mostly massive and heavy formations, and, unlike Cripple Creek, narrow dykes and contact quartz veins are conspicuously wanting.

Some rich discoveries of fissure and contact veins are reported in the granite formations that bound this great igneous field to the south and east, and it is likely that with the heavy influx of prospectors some good veins will be found in this Central Idaho region during this summer.

INDIANA.

MARION COUNTY.

(From Our Special Correspondent.)

Deitz Oil, Gas and Mining Company.—This company has elected the following officers: C. L. Deitz, president; H. S. Frazier, vice-president and manager; Lynn Stone, secretary, and W. F. C. Golt, treasurer. The company will drill for oil in this county. Its office will be in Indianapolis.

SULLIVAN COUNTY.

(From Our Special Correspondent.)

White Ash.—This coal mine, north of Hymera, this county, was badly damaged by fire on June 12. The loss was \$25,000, partially covered by insurance. The origin of the fire is not known.

KANSAS.

LA BETTE COUNTY.

(From Our Special Correspondent.)

Labor Trouble.—The men operating 4 of the blocks of the Edgar Smelter at Cherryvale have struck because helpers were not furnished them. All the smelter men employed at the Cherokee-Lanyon plant at Iola walked out the week before for the same reason.

New Jersey Zinc Company.—This company, which recently purchased 2 smelters in the Kansas gas fields—the Prime Western and the Cockerill—at Gas City, has acquired the George Nicholson Smelter at Iola. The plant will continue under the charge of the western manager of the company, C. C. Cockerill. The Cockerill Smelter will hereafter be known as the No. 1, the Prime Western as the No. 2, and the Nicholson as No. 3. Mr. Cockerill will continue to operate the Rich Hill, Mo., coal smelter in his individual interest. This smelter uses about 100 tons of ore, which will be bought by the ore buyers of the New Jersey Company. The New Jersey Company has decided to call its consolidation the New Prime Western Zinc Company.

MASSACHUSETTS.

BERKSHIRE COUNTY.

Greylock Mining and Milling Company.—This company was organized some months since to work the Lyons "gold mine" in the notch near North Adams. According to a local paper, the stockholders are becoming impatient at receiving no returns, and are to investigate the management and have the mine examined by an expert.

MICHIGAN.

HOUGHTON COUNTY.

(From Our Special Correspondent.)

Arcadian.—The Douglass shaft is sinking to the 9th level.

Calumet & Hecla.—Capt. James Opie is appointed head mining captain of the Calumet branch, succeeding Capt. Thomas Hoatson, resigned.

Centennial.—At this mine A shaft has reached 2,050 ft. The company will continue sinking until 2,500 ft. is reached. Then drifts will be extended north and south to the property boundary lines.

Osceola.—At the North Kearsarge branch excavating for a machine shop, 32-ft. by 60. ft., and a carpenter shop, 36 ft. by 60 ft., is under way.

Rhode Island.—Work at this property is confined to No. 2 shaft, on the Pewabic lode, which is 725 ft. deep. Sinking will continue until 1,000 ft. is reached, when the Pewabic and Allouez lodes will be explored.

Tecumseh.—At this property the shaft on the Osceola amygdaloid is sinking to 1,900 ft. The bottom of the shaft is in good ground, the copper shoots apparently making south from Osceola No. 6 shaft.

Trimountain.—No. 1 shaft is 885 ft. deep, No. 2 shaft 2,750 ft. and No. 3 shaft 705 ft. The new shaft, No. 4, is nearly 50 ft. deep. A large amount of work is under way on surface. The foundation for the new hoisting plant at No. 1 shaft is completed and work on the hoist starts at once. At No. 2 shaft ground for the foundation for a new hoist is broken. Men are clearing the way for a pipe-line to a stream $1\frac{1}{4}$ miles from the mine. A pumping engine will be installed to supply the mine location with 200,000 gals. of water every 12 hours.

Union Land and Mining Company.—This company is not doing any active mining. One engineer is examining and reporting on the 7,000 acres of land owned.

Wolverine.—A 25-drill Rand compressor has arrived and will be erected at No. 4 shaft. The foundation is completed. Sinking in Nos. 3 and 4 shafts is in progress. Drifting south from No. 4 shaft is under way at the 16th and 17th levels and south from No. 3 shaft at the 19th, 20th and 21st levels. No. 2 shaft is sinking to the 19th level, No. 3 to the 22d and No. 4 to the 25th.

COPPER—KEWEENAW COUNTY.

(From Our Special Correspondent.)

Mohawk.—Thirty new dwelling houses will be erected for the accommodation of employees.

IRON—MARQUETTE RANGE.

Fordale.—This old abandoned property, near Humboldt, is being opened by the Bird Iron Company, which is taking out considerable hard ore of good quality.

IRON—MENOMINEE RANGE.

Wisconsin & Michigan Railroad.—This road, owned by Chicago men, runs from Peshtigo Harbor to Faithorn. An extension is being run from Faithorn to Iron Mountain.

MINNESOTA.

IRON—MESABI COUNTY.

(From Our Special Correspondent.)

Explorations have started in section 28, T. 62, R. 14, where it is supposed there are fair indications.

Explorations will begin at the Lockhart land, in section 28, T. 63, R. 12, close to the Chandler Mine. Explorations are under way in the Conan land, adjoining the Pioneer Mine, to the north, and a very deep hole has been sunk there. It is supposed to be the hope that the Pioneer deposit may be struck at depth. Explorations will be undertaken on the Silverman lands, in section 25, T. 63, R. 12, if negotiations do not fall through. These lands have been explored already by large companies. The Mahoning Ore and Steel Company has ceased its explorations in section 31, T. 63, R. 12, where it has been at work a long time.

In section 15, T. 58, R. 19, the Rouchleau-Ray Iron Land Company and R. B. Whiteside have leased to the Eastern Minnesota road the south one-half of the northeast one-fourth, and the southeast one-fourth of the northwest one-fourth at a royalty of 25c., and a 50,000-ton minimum. On these lands several million tons of ore of all grades have been shown. The remaining 40 acres of the south one-half of the north one-half of this section—that is, the southwest one-fourth of the northwest one-fourth, has been leased to the United States Steel Corporation on a 25c. royalty. There is probably a large tonnage of ore on this land. The Mueller lands adjoin this to the south.

Old leases on the Ohio, Missabe Mountain Iron and Mountain Iron mines of the United States Steel Corporation have been cancelled and new ones substituted. Under the old leases the Oliver Iron Mining Company paid 25c. on the Mountain Iron to the feeholder, the Lake Superior Consolidated Mines; now it practically pays nothing, as the fee to the land is held by the same ownership. On the Missabe Mountain there were two royalties, and one of these is eliminated, so there is only the State's 25c. and 5,000-ton minimum. On the Ohio the change is no more than a simplification of bookkeeping.

The Eastern Railway of Minnesota now becomes part of the Great Northern system, and D. M. Philbin, who has been its manager, becomes manager of mines for the Great Northern road. The Great Northern will have all the mines on the Mesabi Range secured by the Eastern, and all business connected therewith will be carried on through Mr. Philbin, at Duluth. It is also rumored that the road is figuring on hauling Minnesota ores to St. Louis, Mo., furnaces, and that satisfactory rates may be made.

Buffalo Steel Company.—The Elba is shipping steadily and will make a large production. The Corsica is not shipping more than 8,000 to 10,000 tons a month. Water is coming in at the rate of about 1,500 gal. a minute. On Pettit & Robinson lands, adjoining the Corsica, the company is finding considerable good ore and much poorer ore by drill explorations.

Donora Mining Company.—This concern is ceasing exploration near Stephens, having shown up a large and very valuable mine. Probably no ore will be mined there this year.

Deering Harvester Company.—Railway connections are being made to the Hawkins Mine, in section 32, T. 57, R. 22; a shaft is being sunk and machinery has been hauled in. The ore mined this year will come from underground. Later it is intended to strip the overburden from part of the property and mill the ore. At the company's Agnew Mine, in section 11, T. 57, R. 21, a shaft will be in the ore in a few months. There is from 90 to more than 100 ft. of overburden.

Elizabeth Iron Company.—This property, 3 40-acre tracts in section 12, T. 57, R. 21, is under negotiation for sale to eastern interests at a price said to be about \$400,000. It is a State lease, calling for a minimum of 5,000 tons a year and a royalty of 25c. a ton.

Mueller Lands.—Suits at law over the 160-acre tract in sections 15 and 22, T. 58, R. 19, belonging to the estate of the late Johann Mueller, who died a pauper, are starting; preparations have been under way for a year. Developments lately seem to show that ore lies to the north and west, and that the actual tonnage on the Mueller lands is small. It is officially denied that the Cleveland-Cliffs Iron Company is negotiating for section 30, Vermilion Range, or that it expects to negotiate for it at any such price as the owners want.

Oliver.—Men are repairing shovels and machinery for a shipment of some size. The minimum is only 5,000 tons, and no more was taken out last year. The Ohio, adjoining, will also ship its minimum, and possibly more. The properties contain a low-grade ore that is not in demand.

Zenith Furnace Company.—This company of Duluth has bought the old West Duluth blast furnace, and is reconstructing it for a capacity of 225 tons of coke iron daily. The new owners are connected with a leading steel interest and a prominent pig iron firm. The furnace will blow in within a month. Ovens for making sufficient coke will be erected at the furnace site.

MISSOURI.

JASPER COUNTY.

(From Our Special Correspondent.)

Joplin Ore Market.—Zinc ore was in good demand at advanced prices last week, and the output and the shipment were much smaller than the previous week. The strike of smelter men at the Edgar Zinc Company's works at Cherryvale, following the strike at the Cherokee-Lanyon Smelter at Iola, did not have any appreciable effect on demand. The Lanyon Zinc Company bought ore for the new smelter it is building at Neodosha. First-grade zinc ore advanced to \$35, at which price the Imperial and Glendale ore on the Continental, the Royal Blue on the Granby and the Perry No. 3 on the Perry lease, the Cumberland and the Boss on the Missouri Lead and Zinc Company, the Amsden on the Estrada and the Superior on the Leonard land sold. The Quaker and Blackberry sold at \$34.50.

During the corresponding week last year the top price of zinc ore was \$27 per ton, and the shipment was greater by 3,047,410 lbs. of zinc and 1,037,450 lbs. of lead and the value was greater by \$31,878. For the corresponding 24 weeks last year the total shipment was less by 5,028,990 lbs. of zinc, greater by 1,118,330 lbs. of lead, and the value was less by \$401,522. Following are the shipments of lead and zinc ores for the week ending June 14.

	Zinc, lbs.	Lead, lbs.	Value.
Joplin	2,806,820	281,310	\$51,134
Cartersville-Webb City	2,334,510	291,810	41,511
Aurora	998,700	9,240	12,750
Duenweg	1,294,200	38,620	20,942
Prosperity	1,093,320	37,480	18,327
Zincite	216,490	8,100	3,752
Oronogo	212,030	8,500	3,456
Spurgeon	178,520	22,030	2,121
Neck-Alba	232,590	.....	3,838
Granby	264,000	46,000	3,835
Carl Junction	130,000	.....	2,145
Carthage	62,290	.....	997
Sarcozie	43,200	.....	691
Total	9,866,730	744,090	\$165,499
Total 24 weeks.	251,069,920	30,150,430	\$3,993,761
Zinc value, week, \$148,984; lead, \$16,515. Zinc value, 24 weeks, \$3,373,507; lead, \$619,254.			

Golden Eagle Mining Company.—This company at Alba is sinking a shaft on a 11-ft. face of lead at 75 ft., a 20-ft. face of zinc at 127 ft., and an 8-ft. vein of coal at 50 ft. The company is working the coal. This is the second zinc mine in the district to produce coal.

New Ore Discovery.—The discovery of immense ore bodies at a lower level northeast of Duenweg is announced. The ore on the Porter, Garrick and Lyon land has all been mined from the 150-ft. level, but drills have shown ore at 160 ft. and deeper. The country southeast of Duenweg, which has not been mined, has been drilled, and the showing is such that United Zinc Companies and others have purchased thousands of acres. The United Zinc Companies has also taken a lease on 20 acres of the Lyon-Doherty land.

Vandalia.—In this mine on the Continental tract two drifts have been opened at 100 ft., and one shows 60-ft. face of jack has been disclosed. In the other the face is 40 ft. Since March the mine has been making from 20 to 40 tons of ore per week, but the past week the ore faces have become almost solid blende, and only slight cleaning on hand jigs is necessary.

West Side Mining Company.—This company, of Webb City, which is mining on the Fox estate, has developed a body of fine ore from 200 to 230 ft. deep, and the mill will start on this dirt within a week. This is the deepest mining known in that vicinity. The Rabbit Foot Mining Company, adjoining on the west, has erected a new 100-ton mill, which will start this week on ore from a 20-ft. face at 200 ft.

ST. FRANCOIS COUNTY.

(From Our Special Correspondent.)

The new railroad, the Missouri Southern, building into the disseminated lead district from the Mississippi River, has begun grading through Flat River. Pending the final decision by the courts, the old road, or the Mississippi River & Bon Terre Railroad, which has hitherto monopolized the heavy freight business, is bitterly fighting the new road, and has obstructed the crossing at Crawley's switch with barbed wire fencing, old rails, and loaded rock cars. The sympathy of the entire community is with the new road.

Central Lead Company.—This company is rebuilding its No. 1 shaft, putting a rock foundation under the gallow's frame. It has just declared its usual monthly dividend.

National Lead Company.—This company is enlarging the old No. 1, or Taylor shaft, from a 1-compartment to 3 compartments.

MONTANA.

BROADWATER COUNTY.

(From Our Special Correspondent.)

East Pacific.—This property, near Winston, is not worked at present, pending the organization of a com-

pany by New York men, who intend to take over all the mining interests of Robert A. Bell in this State.

Keating & Blacker.—These properties at Radersburg are under bond to Boston, Mass., people. H. A. Blackstone, of Boston, represents the company. The shaft on the Keating has been unwatered, and the Blacker is being unwatered. Mr. Blackstone will put in a cyanide annex at the 10-stamp mill of the Keating, and intends to sink new shafts on both properties. If the cyanide plant is a success a large one will be erected. The ore is an iron pyrite, with a gold value of \$12 and upwards.

GALLATIN COUNTY.

Montana Corundum Company.—This company has filed its articles of incorporation. The capital stock is \$300,000 in \$1 shares. The incorporators are James V. Blankenship, Edwin V. Blankenship, Miles L. Rickman, Benjamin I. Cobb, Paul J. Davies, Charles B. Anderson, Thomas J. Fowler, Oliver F. Morgan, Malcolm McLeod, L. Pierce Buzard, Frank A. Maxwell, Daniel E. Allen, William F. Cowan, David S. McLeod, William H. Mitchell, Luke A. Cowan and Charles W. Overstreet, all of Galatin County. The officers are E. V. Blankenship, president; James V. Blankenship, vice-president; Miles L. Rickman, secretary. These, with Paul J. Davis and Frank A. Maxwell, constitute the board of directors.

JEFFERSON COUNTY.

Yellow Jacket.—O. P. Chisholm, of Bozeman; Z. T. Vinson, of Helena, and W. D. Talbot, of Jefferson, have sold this group of claims to the Rose Gold Mining and Milling Company, of New York City, for \$75,000, it is said. The deal was made through James E. Beverage, one of the directors of the company. The group comprises 7 claims, 2 of which are patented. It is said that a large body of low-grade ore has been exposed. The vein is claimed to be from 35 to 100 ft. wide. The company was organized under the laws of New York with \$2,000,000 capital. The property is to be equipped with machinery.

LEWIS & CLAIKE COUNTY.

Montana Mining Company, Limited.—The total output at the Drumlummon Mine in May was 1,470 oz. gold and 7,430 oz. silver from 2,200 tons of ore crushed at the 40-stamp mill, and 11,683 tons of tailings from the dams. The estimated realizable value of the crushings is \$10,600 and of the tailings \$22,600, making a total of \$33,200. The expense of treating the tailings was \$12,000 and the total expense \$23,900, leaving a profit for the month of \$9,300.

The Supreme Court of the United States has decreed that, as the Circuit Court of Appeals had reversed its judgment in the Montana Mining Company's appeal by decision in the St. Louis Mining and Milling Company's appeal, the entire case be remanded. The effect of this decision is to vacate the judgment which the St. Louis Mining and Milling Company recovered for \$23,209, and to remit the entire case for a new trial.

MADISON COUNTY.

Jenny Dell Mining Company.—This company has been organized in Butte with a capital stock of 200,000 shares, par value \$1, to work a group of 6 claims 7 miles from Twin Bridges, and the Jenny Dell and October, a short distance north of Walkerville. It is understood that the company intends to sink the 175-ft. shaft of the Jenny Dell 125 ft.

Watska.—At this gold mine, near Rochester, the main shaft is down 400 ft.

SILVER BOW COUNTY.

Never Sweat.—At this mine of the Anaconda Company, at Butte, the new 800 h. p. electric motor for the compressor is in place. Power will be furnished from Canyon Ferry.

NEVADA.

ELKO COUNTY.

Deater.—The output of the mine at Tuscarora for May amounted to \$12,000, an increase of \$2,500 over the April output. The mine is reported in good condition.

NEW MEXICO.

SANTA FE COUNTY.

(From Our Special Correspondent.)

Cacluti Gold Mining Company.—It is felt in Boston that the committee having the property in charge will bring something to the tired shareholders. An offer is reported for the purchase of the cyanide mill, which might yield stockholders close to \$5 per share, the price at which the stock was originally floated. An electric light plant, owned jointly by Cacluti and Navaho companies at Madrid, is expected to bring back its original cost, about \$250,000.

NORTH CAROLINA.

MECKLENBURG COUNTY.

Wilhelmina.—This gold mine, 5 miles west of Charlotte, has produced in the last 6 weeks with a 10-stamp mill \$2,900 on the plates, together with a

quantity of concentrates. The cost is given as not over \$150 per week. C. A. Ames, of Charlotte, N. C., is manager.

OREGON.

BAKER COUNTY.

(From Our Special Correspondent.)

Badger.—This mine is installing a 100-ton concentrating plant. A cross cut tunnel is started to tap the bottom of the 500 ft. shaft, where a station has been cut. This is to be the main working level.

Golconda.—This mine has uncovered the rich ore shoot for 600 ft. The 3½ ft. vein averages high in gold, with a very rich streak about 10 in. wide.

North Pole.—This mine, the nearest producer to Sumpter, is tearing out the roasters and installing 20 more stamps, making 30 in all. The cyanide process is used on certain of the ores.

Virginia.—The hoist and machinery have been destroyed by fire, and a larger plant has been ordered.

PENNSYLVANIA.

ANTHRACITE.

Anthracite Miners' Strike.—Conflicting reports as to the success of the United Mine Workers in getting the firemen, pumpmen, engineers and the fire bosses to quit work appear, but the operators are evidently keeping the more important mines free of water. Acts of violence and intimidation continue, but as yet no serious rioting. There have been attempts at assassination, and relatives of the men still at work are persecuted in various ways, chiefly by means of the boycott. The strike has lasted nearly 6 weeks, and the end is not in sight. So far the operators have sought only to protect their property and employees, and have not forced the fight. Many miners have left the anthracite region, going to the bituminous regions of Pennsylvania and West Virginia. A general convention of the Mine Workers is to be held at Indianapolis on July 17, at which the question of calling out bituminous miners in Central Pennsylvania and elsewhere will be discussed.

SOUTH DAKOTA.

CUSTER COUNTY.

(From Our Special Correspondent.)

Copper Butte Company.—This company has purchased adjoining ground at a reported consideration of \$50,000. A diamond drill will prospect the veins.

Granite Reef.—Platinum is reported discovered in this mine, 2 miles from Custer, owned by C. W. Robbins, James Demeeu and others, of Custer.

Willow Creek Company.—It is stated that this company will soon resume work on its ground 2 miles east of Custer.

LAWRENCE COUNTY.

(From Our Special Correspondent.)

Clover Leaf Company.—This company has encountered the vein again at the 500-ft. level of its mine on Elk Creek. The company will start 30 stamps of the 60-stamp mill. A Prescott pump, 1,000 gal. capacity, has been ordered.

Deadbroke.—Work is to be resumed in this mine located in Blacktail Gulch.

Horseshoe Mining Company.—The following directors were elected at this company's annual meeting in Deadwood: George Sumner, Montreal; Robert McKay, Montreal; John Johnson, Milwaukee; Chas. Ellis, Chicago; Frank R. Bacon, D. E. Murphey, A. N. McGeoch, Milwaukee; W. H. Nimick, Pittsburg, and E. M. Holbrook, Chicago. The company is rushing work on the new cyanide plant at Pluma.

Imperial Company.—This company has on the cars in Deadwood a complete air-compressor plant, built by the Geo. J. Leyner Company, of Denver, Colo. The Golden Reward Company is putting in 10 Leyner drills at the Bald Mountain mines.

Oro Hondo Company.—Work on a 3-compartment shaft on property south of the Homestake has begun. Geo. M. Nix, of Lead, is general manager.

Pluma Company.—The shaft is reported down about 250 ft. and in ore for 100 ft. The vein is supposed to be the same that is being mined in the Caledonia Mine, a Homestake property, to the north. T. A. Harding, secretary and general manager, is expected to arrive in Deadwood from Des Moines, Ia., this week.

Ruby Mining Company.—An ore house is being built by this company in Ruby Gulch. The ore is to be sorted and the best shipped.

Rossiter Cyanide Plant.—Repairs are being made at this plant in Deadwood by the lessee, John Lundberg. The capacity will be increased to 100 tons daily. The Horseshoe Company will send about 50 tons daily as soon as repairs are made. The Horseshoe Company is now shipping 100 tons to the National Smelter at Rapid City, 100 tons to its own cyanide plant at Pluma and from 100 to 200 tons per day to Denver smelters.

Spearfish Company.—A new shoot of ore has been encountered in the Ragged Top District. It is said to

be 15 ft. thick and of unknown width. The best clean-up ever made was brought this week to the United States Assay Office.

Wasp No. 2 Company.—New shells are being placed on the rolls at this company's cyanide plant in the Yellow Creek District. The ore is a quartzite.

PENNINGTON COUNTY.

(From Our Special Correspondent.)

Basil.—This mine, near Mystic, has been leased to Eastern men, and the ore is being run through the Fairview stamp mill.

British-American Company.—Some of the Eastern stockholders of this company have arrived in the Hills. The company is doing considerable development on 700 acres of copper ground 5 miles west of Rochford.

Ciara Bell Company.—The rich shoot has been cut in the new shaft. The mill is to start soon.

Columbia Company.—At a special meeting of the directors at Sioux Falls, it was decided to appropriate for an air compressor and steam hoisting plant to be installed at the ground on Silver Creek, near Rochford. A shaft is down 70 ft. in a good grade of free-milling ore.

Holy Terror.—Another rich streak is reported in the Holy Terror vein below the 1,200-ft. level.

Iron Creek Strike.—W. E. Gerrard, of Keystone, has made a rich discovery on Iron Creek. He is sinking a shaft.

Mount Aetna Company.—The 2-compartment shaft is finished to the 70-ft. level, and a station is cut. A steam hoist plant is being installed.

Mystic Mill.—The electro-cyanide plant has started again. Contracts have been taken for ore from Silver City and Mystic.

Ohio-Deadwood Company.—This company has purchased an air compressor, and a complete plant will be installed at the main tunnel near Rochford to drive 900 ft.

Tycoon Company.—A second vein of ore has been encountered in the Ranger group, near Keystone. The 10-stamp mill is in operation.

University Company.—A strike is reported on the property being opened 2 miles from Nahant. The company will move its steam hoist from the property on Spring Creek to the Nahant ground. The annual meeting will be held June 18 in Deadwood.

TEXAS.

HARDIN COUNTY.

(From Our Special Correspondent.)

Sour Lake Springs Oil Wells.—Atlantic and Pacific wells No. 2 and Sour Lake Springs No. 1 have been tested again and gushed freely, though the first named seems to produce more oil. The Sun Company is drilling a well 1½ miles east of the gushers.

JEFFERSON COUNTY.

(From Our Special Correspondent.)

Baumont Oil Field.—Oil shipments are very heavy this month, and companies not owning cars have great difficulty in filling orders. Prices average between 20 and 25c. f. o. b. Gladys.

Consolidations of interests will greatly benefit the field. The near future will see a number of big companies.

Burt Refining Company.—This company will construct 2 pipe lines from Beaumont to Sabine, where it is erecting iron tanks. One 6-in. pipe will be for refined oil and one 8-in. for the crude.

O'Neil & Brown Contracting Company.—This company has brought in a well without the use of mud and water; oil was used instead, and its successful use will greatly aid the Safety Committee in its efforts to abolish drilling methods detrimental to the field.

Star Petroleum Company.—This company, recently chartered with a capital of \$10,000,000, merges the holdings and interests of the following companies, which own 12 or 13 wells: Sun Oil Refining Company, Home Oil Company, Saratoga Oil and Pipe Line Company, Texas Standard Oil Company, Omaha Texas Oil Company, Eastern Texas Oil and Development Company, Texas Fuel Oil Company, Diamond Crude Oil Company, Texas Geyser Oil Company, Texas Petroleum and Refining Company.

Union Oil and Refining Company.—This company, capitalized at \$500, intends to erect a refinery between Gladys and Beaumont. Plans have been received.

TRAVIS COUNTY.

(From Our Special Correspondent.)

Palestine Oil and Development Company.—This company has 6 or 7 shallow wells near Austin, which produce 5 to 10 bbls. each per day of high-grade oil. The company also claims to have a 142-ft. well, which produces a liquid asphaltum of fine quality, and preparations are being made to market both these products.

UTAH.

(From Our Special Correspondent.)

Ore and Bullion Settlements.—For the week ending June 14 the banks report the following settlements on bullion, ore and gold bars: Bullion, \$66,300; gold, lead, silver and copper ores, \$301,300; gold bars, \$20,000, and auro-cyanides, \$5,900.

BEAVER COUNTY.

(From Our Special Correspondent.)

Cactus.—Ed. Bettles, metallurgist and millman of the Newhouse staff, has returned to Salt Lake from the mines and experimental mill near Frisco.

Cave.—Manager Wolverton is preparing to forward a lot of gold ore. Colorado men are interested.

Ophir.—At the annual meeting of the shareholders of this State Line Company, the following officers were elected: E. Carhartt, president; George L. Maltz, vice president; Julius Stroth, treasurer, and M. L. Effinger, secretary. These with D. T. Tappey, J. B. Book, C. D. Waterman, L. A. Jeffs constitute the board of directors. No reports were given out for publication.

BOX ELDER COUNTY.

(From Our Special Correspondent.)

Prince of India.—The main tunnel is in 450 ft. The tunnel will be continued from 100 to 200 ft. farther. J. W. Dalbey, of Cedar Rapids, Ia.; also Dr. Cox and Messrs. Perkins & Wind have visited the property, and will devise plans for further improvements.

JUAB COUNTY.

(From Our Special Correspondent.)

Tintic Shipments.—Shipments for the week ending June 14 were as follows: Gemini, 10 cars ore; Sioux Utah, lease 1 car ore; Dragon Iron Mine, 13 cars ore; Silver Summit, 1 car ore; Undine, 1 car ore; Carisa, 7 cars ore; Mammoth, 10 cars ore and 2 cars concentrates; South Swansea, 4 cars ore; May Day, 2 cars concentrates; Bullion Beck, 10 cars ore; Yankee Consolidated, 12 cars ore; Victor, 2 cars ore; Scranton, 2 cars ore.

Alaska.—It is said that the low-grade ore will be treated at the Tuscarora Mill. The ore is a sulphide of iron and copper, carrying gold. Very little of this low-grade ore has been shipped, and all attention has been given to developing the main vein. It is intended to keep the mill in commission all summer.

Mammoth.—The management reports a strike of ruby copper in the workings below 2,000 ft. This ore has been found in the upper workings, but not in any great quantity.

Valley View Company.—Recent prospecting in this company's property, north of Eureka, is said to show ore running as high as 48 per cent lead, 15 to 20 oz. silver, and \$5 in gold from a depth of 190 ft. The cross-cut tunnel will be continued.

Victor.—Two car-loads of ore have been shipped from the ore shoots understood to be in dispute between this company and the Boss Tweed. No active resistance seems to have been offered by the latter company and more cars are to follow.

SALT LAKE COUNTY.

(From Our Special Correspondent.)

Bingham Shipments.—The following shipments were made in the week ending June 14: New England, 2 cars ore; Montezuma, 1 car ore; Neptune, 1 car ore, and Ben Butler, 1 car ore.

Ore Freight Rates.—A report has been in circulation that the Boston and Bingham properties and other large producers are combined in an effort to secure more reasonable rates for ores, coke and lime-rock from the Denver & Rio Grande, and that unless lower rates are granted some method will be devised to secure cheaper transportation.

American Smelting and Refining Company.—The new plant at Murray is about ready for work. Furnaces will start. The Bruckner roasters, 10 of which are in position, are being charged, and as soon as possible the 4 converters will be put in shape. It is expected that the plant will be in full blast by July 1. The plant is one of the most complete owned by the company. A current report says it cost \$1,000,000, but the cost may be greater. Mr. Rhodes is superintendent of the plant. The old Germania Smelter will continue in blast.

Bingham Copper and Gold Company.—Shipments of 10 cars copper bullion are reported for the week ending June 14, aggregating 600,000 lbs., for Eastern refineries.

Petro.—This company, before Judge Hall of the District Court, has filed complaint against the Highland Boy, claiming that the latter company has trespassed upon Petro ground and extracted \$50,000 worth of ore therefrom, asking judgment for that sum and that the Highland Boy be enjoined from working in the ground under dispute. The Highland Boy claims the apex to the vein from which the ore comes lies in the Parnell and in No. 2 claims owned by it. A survey will probably clear up the matter.

Utah Consolidated.—Shipments for week ending June 14 were 4 cars of copper bullion, about 240,000 lbs. sent east to refineries.

SUMMIT COUNTY.

(From Our Special Correspondent.)

Park City Shipments.—For the week ending June 14 the McIntosh Sampler reports the following consignments of ore: Daly-West, 3,146,950 lbs. ore; Loring lease of the Silver King, 87,550 lbs.; Silver King, 1,455,000 lbs. ore; Anchor, 445,300 lbs. ore; Ontario, 1,127,930 lbs. ore.

Comstock.—This company has elected the following officers: A. Hanauer, president; J. Oberdorfer, vice-president; J. M. Cohen, secretary. These, with Morris Dusseldorf, S. C. Hazelton and Max Hanauer, are the directors. The vein is reported 7 ft. wide, showing a good quality of lead-silver ore.

TOOELE COUNTY.

(From Our Special Correspondent.)

Stockton Shipments.—For the week ending June 14 the Ophir Hill reports 40 cars concentrates, and the Hidden Treasure 5 cars ore.

Black Diamond.—Control of this group has passed to Joe Dederich and W. C. Alexander, of Lafayette, Ind. Development will be started at once, and a hoisting plant installed. The mine adjoins the Honerine, and has yielded considerable ore, believed to be more than duplicated below water level. A plan for a drainage tunnel for all the mines at Stockton is in progress.

Consolidated Mercur.—The probable finding of the ore shoot, known as the middle vein, is reported. The ore is oxidized, and the vein has been cross-cut 12 ft. without encountering the foot-wall.

WASHINGTON.

FERRY COUNTY—REPUBLIC.

(From Our Special Correspondent.)

California.—Drifting on the 2d and 3d levels comprises the principal mine work. Lumber is being hauled for the ore bins. A bridge has been built over the San Poil River, and a wagon-road between, and the railroad side track is finished.

Hattie E.—Three prospecting shafts have developed good pay ore, and another, 30 ft. deep, recently sunk, shows the vein about 10 ft. wide. The claim is in Moses District.

Independence Group.—This comprises the Capital, Independence, Manila, Monitor and Columbia claims on the south half of the Colville Reservation. Work will be resumed.

Mountain Lion No. 2.—Under the new contract, the cross-cut on the lower level will be driven to the hanging wall. The water is being raised from the workings. Nine men will be employed.

Surprise Group.—This group, in Moses District, comprises 6 claims. An open cut shows the vein to be 6 ft. wide. The ore is of good shipping value in gold and silver.

WEST VIRGINIA.

Coal Miners' Strike.—A large number of miners in the Flat Top Region and along the lines of the Norfolk & Western and Chesapeake & Ohio roads quit work on June 9 and 10. The strike was nominally to secure increases in wages and the correction of various local grievances, but really was brought on by the agitators of the United Mine Workers to restrict shipments of bituminous coal to seaboard points and to cause inconvenience to all persons who would normally use anthracite but are unable to get it on account of the strike in Pennsylvania. The Virginia and West Virginia miners have never been well organized, and a large part of the men who quit were induced to do so by threats and intimidation. The mining companies made arrangements to protect their property and all employees who cared to work, and as a result the number of men out has been growing steadily less. According to the operators, the wages of the miners have increased, owing to the good market for coal, 25 per cent within the past year, and the real issue is simply recognition of the union. Agitators are under arrest for violating an injunction of the Federal Court, and about all mines in the Fairmount Region are now busy. In the Broad Top field an increased number of men are working.

The mines of the Merchants' Coal Company along Tug River closed because of labor troubles before the present strike was ordered.

FOREIGN MINING NEWS.

AFRICA.

GOLD COAST.

The controller of customs at Accra reports that the gold exported from the Gold Coast Colony during the year 1901 reached a total of 6,163 oz. bullion, valued at £22,187. This is equal to 5,224 oz. fine gold, or \$107,980.

ASIA.

INDIA—MYSORE.

(From Our Special Correspondent.)

Coromandel.—This mine, in the Kolar District, has received a considerable revival by the discovery of a payable vein at the 1,200-ft. level. This mine was floated as a separate company 8 years ago, but the veins decreased in value, and for some years exploring work has not unearthed anything worth working. The quotation of the £1 shares in London remained about 4s. or 5s., but since the discovery mentioned they have rapidly advanced, and now stand at 10s. The vein is reported to average 2-ft. wide, and the contents are 2 oz. per ton. It is likely, therefore, that the shareholders will yet be recouped for their plucky persistence.

AUSTRALIA.

TASMANIA.

The total value of minerals exported from Tasmania in March was £151,455. For the 3 months ending March 31 the value was £394,064, against £419,600 for the first quarter of 1901; showing a decrease of £25,536, or 6.1 per cent. The items of the exports in the month of March were: Copper ore, 843 tons; blister copper, 1,200 tons; gold, 3,653 oz.; gold ore, 5¼ tons; iron ore, 185 tons; silver ore, 1,020 tons; tin, 123¼ tons; tin ore, 10 tons; silver-lead bullion, 319 tons.

The Mines Department gives the following mineral returns from Tasmania for April: Copper ore, 1,172½ tons; Copper (blister), 850 tons; gold, 3,628 oz.; gold pyrites, 25 tons; iron ore, 175 tons; silver ore, 1,371 tons; tin, 145¼ tons; tin ore, 3 tons; silver-lead bullion, 832 tons; total value, £153,826. The return for the corresponding month last year was valued at £154,585.

WESTERN AUSTRALIA.

The gold production for May is reported at 164,226 oz. crude. For the 5 months ending May 31 the total was 846,113 oz. crude, against 696,145 oz. for the corresponding period in 1901; an increase of 149,968 oz., or 21.5 per cent. The total this year was equal to 729,867 oz. fine gold, or \$15,070,220.

CANADA.

BRITISH COLUMBIA—ROSSLAND DISTRICT.

(From Our Special Correspondent.)

Le Roi.—The output in May was 13,200 tons of high-grade ore, of an average value of \$15.82 per ton. This ore was taken from selected parts of the mine, existing conditions having rendered it advisable that for the time being only the best ore accessible should be mined. The bulk of it was extracted from the foot-wall side of the ore body at the 700-ft. level, taking some 30 ft. in width of this shoot. A winze being sunk west of the main shaft at the 900-ft. level was, early in June, going down in ore of excellent quality, assays having given an average value of \$17.30 per ton at 60 ft. depth. A raise from the 1,050-ft. level to connect with this winze had also entered good ore. Shipments to the company's smelter at Northport from the second-class dumps are proceeding, the intention being to ship during June some 15,000 tons. The main shaft is down 1,284 ft. A station is being cut at 1,200 ft. preparatory to running a level. At the smelter 5 furnaces are in operation, smelting about 30,000 tons of one a month. C. P. Dickinson, one of the directors of the Le Roi Company, recently left Rossland for New York on his return to London, Eng., after having made an exhaustive examination of the mine and smelter. Before leaving he said that he was favorably impressed with what he had seen. The company is now in a better position financially than for some time, with excellent prospects for further improvement in June and July.

ONTARIO—SUDBURY DISTRICT.

Canadian Copper Company.—At a meeting of the directors of this company, held on June 9, at Cleveland, O., A. P. Turner was elected president, vice Stevenson Burke resigned; F. S. Jordan was elected vice-president, vice C. W. Bingham resigned; A. J. Watson was elected treasurer, vice H. P. McIntosh resigned; H. P. McIntosh still continues as secretary of the company. On June 16 the office of the company was moved from Cleveland, O., to No. 74 Broadway, New York City.

NEW CALEDONIA.

Exports of minerals from New Caledonia for the full year are reported by the *Bulletin de Commerce* as follows, in metric tons:

	1900.	1901.	Changes.
Nickel ore.....	100,318	133,098	1. 32,780
Cobalt ore.....	2,437	2,872	1. 435
Chrome ore.....	10,474	16,586	1. 6,112

This shows an encouraging increase, especially in the shipments of nickel ore.

NEW ZEALAND.

(From Our Special Correspondent.)

Gold Exports.—The total export of gold during the first 4 months of 1902 was 141,779 crude oz., valued at £541,440 (\$2,707,200), against 137,863 oz., valued at £533,567 (\$2,667,835), during the corresponding period of 1901.

Gold Dredging.—The Molyneux River has now fallen to near winter level, and the weekly returns of the Otago dredges now exceed 2,000 oz. Dredging on the West Coast Field is being pushed with greater vigor, owing to the satisfactory returns of most of the dredges during the past few months. The average weekly return of the 100 dredges or so now at work in New Zealand is between 25 and 30 oz., a yield that allows for a good margin of profit.

Hauraki Goldfield.—The gold production of this field continues to increase at a satisfactory rate. Among late returns are: Waihi, £40,453 (\$202,265), from 11,746 tons; New Zealand Crown, £6,320 (\$31,600), from 2,783 tons; Waitakauri, £3,900 (\$19,500), from 1,989 tons; Talisman Consolidated, £2,545 (\$12,725), from 2,783 tons; Waitikauri, £3,900 (\$19,500), from 610, from 400 tons; Komata Reef, £2,053 (\$10,265), from 830 tons. There are many smaller returns, especially from tributaries at the Thames.

Waihi Company and the Miners' Union.—Since the award of the Arbitration Court in the late mining dispute was given the Waihi Company has gone in extensively for having all mine work done by contract, much to the disgust of the Miners' Union. A few weeks ago Tom Mann, of London Dock Strike fame, who is now a resident of New Zealand, and other prominent labor union men, visited Waihi, and there spoke strongly against the system pursued by the Waihi Company. It was stated that the company by letting contracts at low rates was virtually breaking the award. This and other matters are to be considered at a special meeting of the Arbitration Court.

MINING STOCKS.

(Complete quotations are given on pages 882 and 883.)

New York. June 19.

This has been a week of exceptional quiet in the stock market. Few buyers have been visible, and prices have fluctuated within narrow limits.

In the copper group Amalgamated shows only small sales at \$68½@67¾. Anaconda was off the board entirely on Monday, and on subsequent days sold in a limited way at 114@113 per cent (\$28.50@28.25). On curb the activity that characterized certain favorites last week fell off this week, and brokers did comparatively little. A few hundred shares of United of Montana went at \$35½@34¾, and other transactions were Tennessee at \$15@16¾; Union, of North Carolina, \$4¼@5; White Knob, of Idaho, \$21; Greene Consolidated, \$28½@28¾; British Columbia, \$8½@8¾; Montreal & Boston, \$2¾@2¾. Standard Consolidated, of California, re-appeared with a sale at \$3.25. Quicksilver common sold at \$3½@3¾, and Quicksilver preferred at \$10½@9¾.

Alice, of Montana, after a long absence, came forward at 56c.

In the Cripple Creek section trade is confined to a few dividend stocks. Of these, Portland strengthened to \$1.90 and Isabella to 28c. A sale of Elkton was reported at 61c. On July 14 this company will hold its annual meeting in Colorado Springs.

The Comstock shares were dormant. Consolidated California & Virginia was quoted at \$1.45, Ophir at \$1.20, and Potosi at 23c. So far the assessments to be collected in July aggregate \$60,080. This amount is equal to nearly 43 per cent of the present market value of the properties.

Auction sales were 5 common and 2 preferred shares of the Western Anthracite Coal and Coke Company at \$235 for lot, and \$5,000 4 per cent bonds Diamond State Steel Company at 83¼. We also note auction sales in Philadelphia of 400 shares Tonopah Mining Company, Nevada, at \$10¼, and 100 shares Black Warrior Copper Amalgamated, Arizona, at \$6.

Boston. June 18.

(From Our Special Correspondent.)

The copper share market has been even duller than in preceding weeks, and variations, with but few exceptions, hardly call for comment. Wonderment is expressed at the lack of interest taken in this class of securities, for, as far as the eye can see, favorable conditions as those existing at present have not been seen for months. However, there is a feeling that the present apathy cannot last much longer. Prices continue firm, and this is due largely to the fact that few stocks are offering.

Dominion Iron and Steel broke \$4.50 to \$51, but easily recovered to \$55.50 to-night. The market in this security is really made in Montreal, and is largely a professional one. Copper Range Consolidated yielded \$1.50 to \$57, Tamarack \$4 to \$179, and Mohawk

lost a fraction of a dollar to \$42. Mass Mining hovers both sides of \$20. Daly-West has lost \$1.25 to \$44.50. The new engraved certificates of the Daly-West Mining Company of Colorado are being delivered, and the stock will go on the regular list of the Stock Exchange June 26. Old Dominion has been in better request than almost any other copper share, and has advanced \$1.50 to \$23.50. The new management has taken matters well in hand.

Consolidated Mercur is steady at a few cents under \$2. Rock from the Champion Mine for May, one-half of which stock is owned by the Copper Range Consolidated, yielded 61¼ lbs. mineral, or 45 lbs. of refined copper.

There is a feeling that the Mass Mining management will see the necessity of levying another assessment some time this year to fully equip and develop the property.

Colorado Springs. June 13.

(From Our Special Correspondent.)

The market closed to-day on a stronger basis than at any time during the past three weeks. There is considerable trading, with a decided disposition to buy the higher priced stocks. This latter is one of the most important developments of the month past and is taken as an indication that the home people are picking up the choice securities while they may be had at the prevailing low prices. The Mining Exchange on June 11 dispensed with the afternoon call and will hold but one call a day during the summer months.

Portland was a leading feature of the week. June 11 these shares were quoted freely at \$1.75, but gained in strength until \$1.86 was bid to-day with no one willing to part with stock at that figure. The cause for the improvement is the fact that the new mill at Colorado City has been demonstrated to be a success so far as the tests have been carried. The threatened litigation over the use of the Sloan patent, owned by the United States Reduction and Refining Company, has failed to put in its appearance to date, although it is still reported to be impending.

Salt Lake City. June 14.

(From Our Special Correspondent.)

This week's trading has been exceptionally light. The sales were 112,575 shares for the week.

Most active traders have been the Carisa, which has marketed 10,100 shares at 24½@26c.; Ajax, 8,900 shares at 34½@37c. Consolidated Mercur, 3,900 shares, were sold at \$1.98@1.95. Daly records but 373 shares sold, prices advancing to \$2.05. Daly-West has moved up two points, placing 1,176 shares at \$45.30@45.80. Very few shares of the Daly-Judge have appeared, but this last week 450 was called for at \$7 per share. Lower Mammoth records a drop of 2 points from last week on sales of 3,675 shares at \$1.13@1.20. Mammoth remains steady around \$1.20, selling 500 shares, while May Day marketed 6,700 shares at 20@22. Uncle Sam Consolidated sold 3,450 shares at 30@31c. Yankee Consolidated was \$1.10@1.16, marketing 1,600 shares. California showed 35,000 shares at 10@13c. Century of Park Valley reports 5,900 shares at 35c. high and 26½c. low.

San Francisco. June 14.

(From Our Special Correspondent.)

Trading has fallen off again and business has been quiet, with a rather lower range of prices. Consolidated California & Virginia was quoted at \$1.30@1.35; Ophir, \$1.15; Caledonia, 83@84c.; Mexican, 32@44c.; Hale & Norcross, 40@45c.; Potosi, 24@26c.

It is understood that arrangements are completed for the sale of the Stock Exchange building by the owners, who constitute a corporation distinct from the Exchange itself, though the stockholders are all members of the board. Under the existing contract, however, the Exchange will continue to occupy its present quarters in the building for a year. This sale has revived the talk as to the future of the Exchange. This is not brilliant if we keep on as at present. The Comstocks have practically lost all interest for the public. The effort made some time ago to get some California stocks listed was a failure, because the companies would not co-operate and list their shares. Now, Tonopah and other new districts are talked about, but there is no agreement except on the one point that some change must be made if the Exchange is to survive.

The sworn statements of the mining companies, as filed this week, show cash on hand June 1, with all expenses paid, unless otherwise noted: Alpha Consolidated, \$718; Alta, \$554, with indebtedness of \$3,015; Andes, \$235, with indebtedness of \$1,289; Best & Belcher, \$293, with \$3,000 due the bank and \$15,000 bills payable on account of mill purchase; Bullion, \$1,181; Caledonia, \$1,695, with May expenses unpaid; Confidence, \$527, with May expenses unpaid; Consolidated California & Virginia, \$49,290, with a car-load of concentrates to be accounted for; Crown Point, \$1,275, with May expenses unpaid; Challenge Consolidated, \$518; Consolidated Imperial, \$1,909; Chollar, \$191; Gould & Curry, \$4,738, with liabilities amounting to

\$13,077, and bills receivable of \$15,000; Justice, \$200, with indebtedness of \$6,114; Mexican, \$890; Ophir, \$1,519; Overman, \$8,942, with May expenses unpaid; Potosi, \$909; Savage, \$4,583; Silver Hill, \$11,862; Standard Consolidated, \$107,021, with May clean-up and May expenses to be accounted for; Syndicate, \$3,533; Union Consolidated, \$697.

The following companies report indebtedness on June 1: Belcher, \$10,500; Sierra Nevada, \$298; Utah, Consolidated, \$1,750.

The following companies had assessments in course of collection on June 1: Alta, Andes, Belcher, Best & Belcher, Caledonia, Challenge Consolidated, Justice and Utah Consolidated.

Business on the Oil Exchange has been somewhat quieter, and buying has run chiefly to small lots. Prices have been somewhat variable. Home brought \$3.35@3.40; Sterling, \$1.40@1.55; Monte Cristo, \$1.30; Sovereign, 25c.; Oil City, 17c.; Petroleum Center, 2c. Sterling continues to be a favorite.

London. June 7.

(From Our Special Correspondent.)

The troubles of Le Roi seem never to cease. At the meeting of shareholders of this company, held this week to discuss the future policy, a great many influential shareholders had serious accusations to make against the new Board of Directors and the new manager. The main cause of complaint was that the reports relating to the condition and prospects of the mine were contradictory, and that cables were kept back and acted on for Stock Exchange purposes by the insiders. As I mentioned last week, the shareholders have been considerably mystified by Mr. McKenzie's reports from the mine. First of all, monthly profits are reported, and afterwards it is announced that the smelter losses are so serious that instead of a profit there is an actual loss. After that we are informed that it will not pay to work the mine at all at the present low prices of copper and silver and the high price of fuel, and that the manager recommends that the mine be shut down for a time. Then comes the report that a better grade of ore is being shipped, and that even with the low prices of the metals and the smelter losses a profit of \$50,000 for May is estimated. A member of the Stock Exchange assured shareholders that there were extensive operations conducted by somebody who must have had knowledge of these reports before their publication. Who this somebody was could not be ascertained, as all the directors and the secretary disclaimed any knowledge of the subject. The meeting ended by the appointment of a committee to investigate the doings of the board and the policy of the company. There does not seem to be much to investigate at the present time, except whether the manager, Mr. McKenzie, is under the influence of speculators or not. This is a point on which it is practically impossible to get any definite evidence. It may, with justice to Mr. McKenzie, be said the contradictory reports need not necessarily be supposed to be the outcome of any intention to mislead. They may have been the hastily uttered opinions formed from time to time during the study of an admittedly difficult problem. Such varying opinions are continually being given in private, but it is certainly injudicious to give voice to them to a body like the Le Roi shareholders, and to the London speculative public. In all probability the Committee of Inspection will recommend a change of management and directorate. As most of the directors are now tired of their positions, since their expectations with regard to the mine have not been realized, they will be quite willing to hand over the responsibility to some one else.

The other Rossland mines move very much in sympathy. There is no particular news from Le Roi No. 2, from the Rossland Great Western, nor from the Columbia & Kootenay, and shareholders are pessimistic about them.

COAL TRADE REVIEW.

New York. June 27.

ANTHRACITE.

The leaders of the United Mine Workers in announcing a call for a national convention at Indianapolis on July 17 are evidently playing their last card. The announcement may be taken as a confession that they feel the strike is going against them, and desperate measures are necessary to hold the men in line and by threatening widespread disaster, goad the public, which is paying for the strike, into doing something. There is no doubt but that almost any concession made by the operators would be accepted. Companies are reported to have ordered their mine superintendents to start collieries when a sufficient number of men apply, guaranteeing them protection and permanent positions. Just how soon any large proportion of the men will apply for work is uncertain, but it seems likely that shortly after July 1 a break will come.

Trade all over the country is light because coal is not to be had except at heavy advances. In many

cases conservative dealers in the East are refusing profits of \$3 or \$4 a ton on coal bought April, preferring to keep their stocks to supply their regular customers. At the head of Lake Superior the docks are nearly bare, and supplies in dealers' hands are light. In Chicago territory the demand continues fair. Dealers report a considerable volume of inquiries; most of these are turned down. Along the lower lakes the large producing companies are doling out to regular customers such reserves of coal as are available. Along the Atlantic seaboard most consumers are getting reconciled to the situation, and the market has lost its nervousness. Coal is in demand at New York Harbor points, and we hear of dealers making turns of \$4 per ton on lots of 100 to 5,000 tons. The total amount of coal in dealers' hands in New York is considerable, but probably not as large as has been reported, and the supply of broken is particularly short. Certain companies that are using soft coal and are being threatened with violations of the smoke ordinance make the most of reports of short supplies, but there is undoubtedly coal that can be had for a price enough to last a month and more. At Boston trade is light, but there is coal enough available to last for some time yet. Demand at Philadelphia is light likewise, but there is coal enough available for domestic purposes until into August.

BITUMINOUS.

The heavy demand for coal in the Atlantic seaboard bituminous trade continues, but producers are keeping well up with their obligations. Users of anthracite and the uncontracted soft coal consumers are the persons who must pay fancy prices. All bituminous producers continue to take care of as large a proportion of the full monthly quotas called for in contracts as their output and the supply of cars will allow; at the same time they are watching closely to see that shipments do not exceed these quotas. Speculative coal is apparently in fair to plentiful supply at the quoted speculative market prices. Producers get little benefit from these, the profits accruing to speculators and middlemen. Speculative prices now range around \$4.25@4.50, f. o. b. New York Harbor shipping ports for Clearfield grades. The prices vary according to the needs of the purchaser and market rumors.

As to labor troubles at the mines, the men in Virginia, along the Norfolk & Western road, are slowly going back to work. The men along the Chesapeake & Ohio are better organized, and are holding out longer. In West Virginia there are numerous sporadic strikes, and the exact situation is hard to determine. At some mines the men are weakening, at others they are holding out. A great deal of coal is now being shipped over the Norfolk & Western. The Pennsylvania miners to a great extent are working under clearly drawn contracts, which the labor leaders seem chary of approaching. There are no labor troubles in Maryland.

Trade in the far East is taking considerable coal. The partial stoppage of shipments from the Chesapeake capes is just being felt, but the shortage is being filled by outside coals. Stocks on hand are thought to be fair. Along Long Island Sound consumers are taking all the coal that can be shipped them. At some points needs are greater than at others. Consumers at New York Harbor points who have contracts are cared for fairly; those who have not contracts must pay speculative prices. All-rail trade is short of coal; producers are giving it about three-fourths of the total demands of consumers.

Transportation from the mines to tidewater is slow and irregular. Shippers, unless they have a large tonnage waiting for coal, are apt to be caught at times by heavy arrivals at tidewater, offsetting the days when no coal runs in. The railroads watch all delays in unloading closely, and it is believed that they will enforce strictly the late car demurrage circular. Car supply at the mines is regulated to a large extent by prompt handling at the shipping ports, but is generally fair to good. In the coastwise vessel market vessels are in plentiful supply and rates are weak; prompt loading and discharge will secure discounts from the current quotations, which from Philadelphia are as follows: Providence, New Bedford and Long Island Sound, 70c.; Boston, Wareham and Portland, 85c.; Salem, Portsmouth and Bath, 85@90c.; Newburyport, 95c@81; Saco, \$1 and towages; Bangor, 90@95c.; Gardiner, 90c. and towages.

Birmingham. June 16.

(From Our Special Correspondent.)

The convention of the United Mine Workers in Alabama is now on in Bessemer. The new scale to go into effect on July 1 will be presented to the operators for their consideration next Monday.

The domestic demands for coal are good, while there is a fairly good trade being worked up now from the Atlantic coast. Much coal is being shipped from the district. Good prices obtain.

The Sloss-Sheffield Steel and Iron Company is making considerable progress on the Flat Top Mountain mines. This company is also taking hold of the

properties recently purchased, known as the Lady Ensley Mines.

Chicago. June 17.

(From Our Special Correspondent.)

"We are not in the anthracite business any longer," is the way wholesaler dealers in coal express the condition of trade consequent upon the strike. Not a pound of hard coal is being sent out of the yards, except to fill orders given before the beginning of the strike, and the consequent stoppage of shipments. The extension of strike conditions to the mines of smokeless coals has resulted in cutting off that trade also. Consequently, the business in bituminous grades is busier than ever, and a noticeable feature of this trade is the greatly increased amount of soft coal being received by boat. Like Milwaukee and upper lake ports, Chicago is beginning to lay in a stock of bituminous at the river yards. This is probably due more to exasperation with the railroad service of last winter than to any other one cause; the uncertainties of railroad service make it imperative on wholesalers to provide as far ahead as possible. The strike of tugmen on the lakes, however, make navigation in the river uncertain, full of delays and even dangerous to some craft. If Chicago is to maintain her lake trade, radical improvements must and doubtless will be made.

Prices are virtually unchanged from last week's schedule: Smokeless lump and egg, \$3.50; smokeless nut, \$3.25; smokeless run-of-mine, \$3.10; Hocking, \$3; West Virginia, \$3.15; Youghiogheny, \$3.20; Indiana block, \$2.45; Indiana semi-block, \$2.10; Clinton lump, \$1.90; Indiana lump, \$1.85; Northern Illinois run-of-mine, \$1.80; Southern Illinois run-of-mine, \$2; blacksmith's coal, \$3.35.

Cleveland. June 18.

(From Our Special Correspondent.)

The lake coal situation has materially improved. The lake receipts during the last week or ten days have been very much heavier than at any time during the year. Some are reporting that their supply is about two-thirds of the needs, but even this is a vast improvement over what has been noted heretofore since many of the shippers until now have been getting about one-fourth of what they ought to have. The docks have been jammed for the better portion of the season with boats waiting for cargoes. The supply of cars has been so much better that now the delays to vessels at docks have been reduced to the minimum, and the boats are accordingly getting much better service. In the domestic trade there has been a great deal of uneasiness over the hard coal situation. Some wholesalers here have sold large amounts of hard coal at reduced prices, and if the mines increase the price to make up for the lost time some of the hard coal dealers will have difficulty in meeting their contracts and yet coming out even. Many of them have withdrawn their soliciting forces from the road, knowing that any further selling would only complicate affairs without adding any material advantage.

Pittsburg. June 18.

(From Our Special Correspondent.)

Coal.—The strike of the anthracite coal miners has increased the demand for bituminous coal, and a premium is offered over circular prices of \$1 a ton and more. The Pittsburg Coal Company, the railroad coal combine, has received many inquiries, but is unable to consider them, as it has already contracted to deliver the entire production for the season. It is reliably reported that fully 100,000 tons of coal is being shipped to the Eastern market daily from Western Pennsylvania at \$2.25 a ton at the mine for run-of-mine coal. Several independent companies that have no pressing contracts are shipping to the East, and participating in these profitable prices. The circular prices for coal for the year fixed by the Pittsburg Coal Company are: 1¼-in., \$1.45; ¾-in., \$1.35, and run-of-mine, \$1.25 a ton at the mine. All the mines are in full operation this week, and there is a good supply of railroad cars. A rise in the rivers is expected within a week, and if sufficient water arrives the Monongahela River Consolidated Coal and Coke Company will send out a number of large tows to the Southern markets.

Connellsville Coke.—The production in the Connellsville Region for the week has passed the 250,000-ton mark. The railroads are supplying all the cars needed for Western shipment. Prices remain firm, furnace coke being quoted this week at \$2.25 and foundry at \$2.75 to \$3. The Courier, in its last issue, gives the production of coke for the previous week at 250,384 tons. Shipments for the week aggregated 12,065 cars, distributed as follows: To Pittsburg and river tipples, 4,155 cars; to points west of Pittsburg, 4,945 cars; to points east of Connellsville, 2,985 cars.

Foreign Coal Trade. June 19.

Export trade here is very quiet, partly as a result of the condition of the local coal trade and the taking of bituminous coal by parties who usually buy anthracite. There has been nothing new in the way of charters.

Imports of fuel into France for the quarter ending March 31 were as follows, in metric tons:

	1901.	1902.	Changes.
Coal	3,038,240	2,736,960	D. 301,280
Coke	394,910	272,240	D. 122,670
Totals	3,433,150	3,009,200	D. 423,950

Of these imports 25,400 tons were from the United States this year. The exports for the quarter were 181,900 tons, against 130,360 tons for the first quarter of 1901; and in addition 34,840 tons of coal were sent abroad for the use of steamers in foreign trade, against 53,900 tons last year.

Exports of coal from Belgium for the four months ending April 30 were 1,600,239 metric tons, against 1,625,322 tons for the corresponding period in 1901.

The Prussian Government has again this year bought its supply of coal for the State Railways from the Coal Syndicate at 11 marks (\$2.62) per ton, the same price that was paid last year. According to estimate the Prussian State Railways require 2,850,000 tons, which will cost \$7,467,000, or \$122,094 more than the Budget estimated when it fixed the price at 10.82 marks (\$2.58). The consummation of this contract has initiated active mining throughout the Rhenish and Westphalian coal districts.

Messrs. Hull, Blyth & Co., of London and Cardiff, report under date of June 6 that the Welsh coal market remains very steady and prices show a slight improvement. Many collieries, both Cardiff and Newport, appear fully stemmed. Quotations are: Best Welsh steam coal, \$3.96@4.08; seconds \$3.90; thirds, \$3.60; dry coals, \$3.30; best Monmouthshire, \$3.42@3.54; seconds, \$3.24; best small steam coal, \$2.22; seconds, \$2.04; other sorts, \$1.80.

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 freight market is exceedingly quiet and stems are difficult to arrange. Mediterranean rates are slightly easier. Some rates quoted from Cardiff are: Marseilles, \$1.45; Genoa, \$1.38; Naples, \$1.38; Singapore, \$2.76; Las Palmas, \$1.50; St. Vincent, \$1.74; Plo Janeiro, \$3.12; Santos, \$3.42; Buenos Ayres, \$3.24.

IRON TRADE REVIEW.

New York. June 19.

Some uncertainty is developing, owing chiefly to the anthracite strike and the possible extension of the trouble in the bituminous coal districts. Although this is rather a contingency than a probability, it is causing an uneasy feeling in some quarters, and furnacemen are rather reluctant about closing new contracts. Conservatism is beginning to be apparent in some unexpected quarters. However, it would not take very much to change this feeling, which is rather a tendency at present than a development.

Import trade is a matter of some importance, and it is understood that the orders placed abroad have reached a considerable total.

Prices seem to be altogether unsettled, owing to the payment of premiums on short deliveries. It is very difficult to get at the amount of these, or at the proportion of the trade which is covered by them. Probably it is less than is generally supposed.

Generally it may be said that every one in the trade is busy, and that full deliveries on long contracts are not only freely accepted, but are urged by buyers.

Birmingham. June 16.

(From Our Special Correspondent.)

There is at present no iron to be sold. Prices are strong and inquirers for immediate delivery appear to be willing to pay almost any price. A small lot of No. 1 foundry sold as high as \$19 per ton and No. 2 foundry at \$17.50. Those who had orders accepted some months since are now watching the delivery of their iron. The production is improved a little by the blowing in of the big, new furnace of the Republic Iron and Steel Company, at Thomas, which is finally in operation. As yet, no statement is made as to sales for delivery in 1903.

During the week the report of the Southern Iron Committee for the month of May, 1902, was made public. It showed shipments from the Southern field by districts as follows, in tons:

District.	Pig Iron.	Cast Iron Pipe.
Anniston	21,857	4,942
Birmingham	77,518	7,716
Nashville	8,710	...
Sheffield	16,248	...
Middlesboro	3,383	...
Chattanooga	24,428	4,907
Total	152,174	17,565

The total shipments of all metals from the Southern field amounted to 169,739 tons during the month of May, of which 11,259 tons were steel shipped from the Ensley plant of the Tennessee Coal, Iron and Railroad Company. The export shipments were very light during last month, only 230 tons of pig iron and 331 tons of cast iron pipe going abroad.

There are some good shipments of basic iron being made from this district to steel works in the West and there is a good demand for this product.

Steel production is heavy and the shipments continue to increase. At the rolling mills in this district there is no cessation of work and there is a good demand for the product. In cast iron pipe there is still much doing, and orders are on hand which will warrant steady operation all through the summer.

The plant of the Alabama Steel and Wire Company at Ensley is in full operation. The plant of the Austin-Bryan Manufacturing Company, manufacturers of steel plows and other agricultural implements, has been shut down for necessary repairs and will be closed for two months.

A rumor prevails that Pennsylvania parties have been in the Birmingham district recently looking after the purchase of ore and coal lands, in connection with the erection of blast furnaces, a steel plant and a rolling mill, but no definite statement is made.

The Sloss-Sheffield Company's furnace in the city, which has undergone extensive repairs, will go into blast about July 1.

Buffalo. June 17.

(Special Report of Rogers, Brown & Co.)

More activity is apparent in the trade tributary to this market. Inquiries are numerous and sales running well into 1903 are not infrequent. Interest as to the probable course of the market next year is now very general. The question involved should not be considered as one of speculation, but one of supplying known requirements in advance. Furnaces are occupying a neutral position as to future sales. For delivery before January 1 quotations given below are fairly representative. For shipment during first half of 1903 somewhat lower prices are obtainable. We quote for cash f. o. b. cars Buffalo: No. 1 strong foundry coke iron, Lake Superior ore, \$23.25; No. 2, \$22.25; Southern soft No. 1, \$22.75; No. 2, \$22.25; Lake Superior charcoal iron, \$23.50.

Chicago. June 17.

(From Our Special Correspondent.)

Southern iron holds up practically on a level with Northern, as regards price; most sales are probably being made at \$18 Birmingham, or \$21.65 Chicago, for No. 2, and the customary 50c. difference above and below this price for Nos. 1 and 3, respectively. Northern continues at \$21.50-\$22 for No. 1, \$21-\$21.50 for No. 2, and \$20.50-\$21 for No. 3. Odd lots of Lake Superior charcoal readily bring \$24.50. This grade is almost entirely out of the market.

Coke is becoming scarcer, and will probably go above the \$5.75 mark it has now reached. The entire product now purchasable here is that of the West Virginia ovens. There is no hope of Connellsville until the strike situation changes.

Cleveland. June 18.

(From Our Special Correspondent.)

Iron Ore.—For the first time since the present season of navigation opened the vessels engaged in the ore-carrying trade are evenly distributed, and the transportation of that material is proceeding without any delays. The present condition is very satisfactory, but it is the outgrowth of a condition in St. Mary's River last week, which was disastrous to the shipping of ore during the month of June, as the delays occasioned by the falling of a bridge would greatly reduce the amount of ore that is to be brought down the lakes this month. The delay to down-bound boats was accompanied by a better supply of cars at the unloading ports and the delays to vessels at Lake Erie docks was dispensed with. Even with the freer movement of that material the rates of carriage have not been changed, as the shippers threatened a week or 10 days ago.

Pig Iron.—Selling of foundry iron for delivery during the first quarter of 1903 has been started. The prices that are now being paid on these advance contracts are \$22 for No. 1 Valley furnace, and \$21.50 for No. 2 also in the Valley. The supply for immediate shipment is entirely gone, and there is but little, if any, iron offered for sale during the third and fourth quarters of the year. The Bessemer Association held an informal meeting during the week and discussed prices, but made no sales for future delivery. Some sales are pending, but have not been closed. There is no bessemer or basic for sale on the market now, even though some are offering good premiums.

Finished Material.—This week has seen the first selling of rail and structural shapes, and a few plates for delivery during the second quarter of next year. No other grades have been sold so far ahead. The prices on all of these materials is the same as has been adhered to by the association for this past year. Plates are very scarce, and especially the gauges intermediate between plates and sheets. In some sizes of plates importations have already been made by the American Ship Building Company for ship work, and other concerns follow. The price holds on the market here at 1.70c. Structural steel is the leader on second quarter of 1903 buying, and the price holds firm at 1.70c. There is little or no ma-

terial being offered for immediate shipment, and those who are fortunate enough to have it are commanding high prices. Steel rails are selling extraordinarily well, and the prospects are that a large amount of 1903 material will be covered before the month is out. The price holds at \$28. Sheet sales are active, and the market strong, but without any tendency on the part of the buyers to overload the mills with orders. Prices hold at 2.50c. for No. 10 and 3.50c. for No. 27 as basing prices for the different gauges. Specification on all old contracts has been very heavy, and it is now assured that the business done so far has been entirely free from any suspicion of speculation.

Philadelphia. June 19.

(From Our Special Correspondent.)

Pig Iron.—Reports gathered to-day from the leading pig iron representatives in Pennsylvania are contradictory and unsatisfactory. Brokers are selling very little iron, and representatives of furnaces have declined to quote prices on inquiries until further advised by their principals. Users of both basic and bessemer pig are reported here as willing and anxious to make more extended contracts for future delivery at what are said to be advancing prices. Basic iron quotations have been advanced 50c. No transactions are spoken of. Users of foundry appear to be out of the market. Negotiations are pending for a few lots, but makers of foundry are not urging business, and prefer, they say, to wait for a month or so before entering into large deals. Forge iron is exceptionally quiet. The restriction in furnace production is not having any perceptible effect upon the market as yet.

Muck Bars.—An advance of 50c. has been made on muck bars, and several sales have been made at this advance.

Merchant Iron.—Both millmen and storekeepers are doing a good business in common, refined and in steel bars. Consumers are anxious to pick up all they can get, and some sales made this week show that an advance of 0.2c. is readily paid. All business that can be heard of is in small lots.

Pipes and Tubes.—In pipes there is nothing new, but in tubes quite a good business has been done in orders from small consumers throughout this territory and in New England. Tubes are very high, and on small orders for early delivery extra prices have been paid this week.

Plates.—The action of the plate makers has left everything unsettled. Large consumers of plate say that they have good reasons to believe that favors will be extended to them on orders they expect to place next month. The intimation is that plate iron makers are inclined to court buyers, but makers say there is nothing whatever in this, and that the plate mills are oversold; that there is more probability of an advance in midsummer than a concession.

Structural Material.—Representatives of structural mills say that they have a great deal of business within sight hanging fire, and that no transactions of any magnitude have been closed this week. Producing capacity is strained, and will be for months to come, but construction requirements in and about the city are promptly supplied.

Steel Rails.—There is a rumor that contingencies are likely to arise during the summer which will induce the rail-makers to change their views and to advance prices to \$30 or \$32. This rumor is given for what it is worth—probably not much.

Old Rails.—There is a very urgent demand just now for old rails, particularly from the West, and the effect upon this market has been to advance prices \$1 per ton; but old rails cannot be had.

Scrap.—Customers are trying to secure certain kinds of heavy scrap at any price. Choice railroad scrap is out of the market for the next two months. Heavy steel is 50c. higher; yard scrap is selling in a small way.

Pittsburg. June 18.

(From Our Special Correspondent.)

It is announced that the United States Steel Corporation has abandoned negotiations for the purchase of 150,000 tons of bessemer pig iron for delivery during the second quarter of next year. A meeting of representatives of the subsidiary companies was held in New York on Thursday, at which the purchasing of pig iron for future requirements was considered. All contracts so far made by the big steel combine for iron up to April 1, 1903, were on a basis of \$16.50, Valley furnaces. Since these orders were placed prices have advanced steadily, and it is now impossible to buy at less than \$20 even for the first half of the coming year. It had been proposed to instruct the Pig Iron Committee to open negotiations with the Bessemer Furnace Association, but upon advice that the merchant furnacemen would make no concession in price under present market conditions, it was decided to drop the matter. One argument advanced was that there is but little probability of a further increase in price, and it would be no advantage in placing a big order now for second quarter delivery unless at

a particularly favorable rate. This decision has caused considerable gossip. It is said the steel combine being the heaviest purchaser from the Bessemer Furnace Association contended that it was entitled to a lower rate. One rumor is that a threat was made to the effect that if a special price was not made the Steel Corporation would build a sufficient number of furnaces to supply its full requirements, withdrawing its patronage entirely from the merchant furnaces. While the threat may not have been made, it brought out a reply from a representative furnace owner, who declared that the United States Steel Corporation plans to build more furnaces and intends to be independent as to raw material at as early a date as possible. This is indicated by the adding of two furnaces to the Carrie group at Rankin, work on which is rapidly progressing. There is but little pig iron to be had in the Valleys for this year, and large sales have been made into the first and second quarters of next year.

The market for finished iron and steel products is firm but quiet, except wire and sheets, which are unusually dull. A movement is on to close all the wire mills for two or three weeks about July 1. A number of independent sheet mills have been shut down, in some instances, however, on account of lack of material. Deliveries are good, and prices are down to the lowest point, which is evidenced by the fact that some of the combine plants have been closed. Several steel mills in the West are reported idle on account of inability to secure pig iron, and one plant in Wheeling is running half time. The quotation of 1.60c. for steel plates is nominal. That price is named by the United States Steel Corporation, but it cannot make deliveries until the latter part of the year. The Jones & Laughlins Steel Company quotes 1.60c. for late delivery, but for early shipment is asking 1.85c., which represents the actual price. The Illinois Steel Company at Chicago is out of the market for the balance of the year, and Eastern manufacturers have been quoting plates up to 2c. for some time, Pittsburg being the lowest point.

A strike of molders and pullers-out in the melting departments of the plants of the Crucible Steel Company of America, which began on Sunday at all of the works but one in this district, may result in crippling the company if it is prolonged. These workmen are paid by the melters, who are employed by the company, and they demand an advance of 15 per cent. The melters are making no demand. An effort is being made to extend the strike to the finishing departments, but there seems to be little prospect of success.

The details of the sheet workers' wage scale were finally arranged at a conference between representatives of the Amalgamated Association of Iron, Steel and Tin Workers and the American Sheet Steel Company on Friday. Both sides made concessions. A conference on the tin plate scale will be held next week. The Tin Workers' International Protective Association, composed of tinhousemen, arranged its scale with the American Tin Plate Company at a conference which continued for a week ending last Saturday. A slight advance was conceded the workers.

The Jones & Laughlins Steel Company to-day announced a voluntary advance in wages to all of its employes, except the tonnage men, of 10 per cent. About 7,000 men are affected.

A meeting of the Independent Sheet Manufacturers' Association is being held here to-day. One of the objects of the meeting is to hear the report of W. F. Bonnell, of Cleveland, who went to Europe about two months ago to secure sheet bars, but failed, owing to the high price. The meeting was poorly attended, and is still in session.

Pig Iron.—From 5,000 to 6,000 tons of bessemer pig iron were sold during the week at \$21, Valley furnaces, for delivery between October 1 and April 1. For prompt shipment \$22 could readily be obtained. Gray forge is firm at \$21, Pittsburg, and about 500 tons were sold. Foundry No. 2 is scarce, and has advanced to \$22-\$22.75, Pittsburg.

Steel.—Several small lots of bessemer steel billets were sold at \$35. An offer was made this week of 2,000 tons of German open-hearth billets at \$32.25 delivered in Pittsburg. This was the former quotation for bessemer billets, and is taken as an indication that the German market is weaker. Tank plates are quoted at 1.60c. and steel bars are firm at 1.60c.

Sheets.—The market is extremely dull, and No. 28 gauge is quoted at 3@3.10c. Deliveries are good. Galvanized sheets are 4.45@4.50c. in car-load lots.

Ferro-manganese.—Domestic 80 per cent continues scarce, and is not quoted. Prices of the foreign product remain unchanged at \$52@55 for British and \$49 for German.

New York. June 20.

Pig Iron.—The supply of iron continues light in comparison with demand, and premiums for spot iron are, if anything, higher. We quote for tide-water delivery: No. 1X foundry, \$22@23.25; No. 2X, \$21@22; No. 2 plain, \$21. For Southern iron on

dock, New York, No. 1 foundry, \$21.50@22; No. 2, \$20@21; No. 3, \$19@20.

Bar Iron and Steel.—We quote on large lots on dock: Refined bars, 1.95@2c.; soft steel bars, 1.83c.

Plates.—Demand continues good. We quote for tidewater delivery in car-loads: Tank, 1/4-in. and heavier, 2@2.10c.; flange, 2.05@2.15c.; marine, 2.15@2.25c.; universal, 1.95@2.05c.

Steel Rails.—Standard sections are quoted at \$28. Light rails are \$30@33, according to weight. It is doubtful if deliveries on new business can be secured before the end of the year.

Structural Material.—Importation of foreign material, particularly beams and angles, are of increasing volume. The market continues strong. We quote for forward delivery on large lots at tidewater as follows: Beams, 2@2.20c.; tees, 1.95@2.15c.; angles, 1.95@2.25c.

CHEMICALS AND MINERALS.

New York. June 19.

Heavy Chemicals.—The closing of leading glass works, which is usual at this season, has lessened the demand for prompt alkali and caustic soda. For forward shipment, however, more new orders have been taken at quotations below. Warm weather has raised the price of domestic sal soda. Chlorate of potash is easy. Domestic chemicals, we quote, per 100 lbs., f. o. b. works, as follows: High-test alkali, in bags, 80@85c. for prompt shipment, and 75@77 1/2c. for forward; caustic soda, high-test, \$1.90@1.95 for early delivery, and \$1.85@1.87 1/2 for futures; bicarb. soda, ordinary, 95c., and extra, \$3; sal soda, 65c.; chlorate of potash, \$7.75; bleaching powder, off-test, \$1.35; best grades mostly under contract. For foreign goods we quote per 100 lbs. in New York: Alkali, high-test, 90@92 1/2c.; caustic soda, high-test, \$2.25; sal soda, 67 1/2c.; chlorate of potash, \$10 1/4@10 3/4; bleaching powder, prime brands, Liverpool, \$1.75; Continental, \$1.60@1.65.

Acids.—Quiet but firm in price. Blue vitriol exports from New York in May totaled 2,655,483 lbs., valued at \$107,176, or \$4.04 per 100 lbs., showing a heavy decrease in quantity as compared with the 3 months previous, but an increase in value over March and April. In the 5 months ending May 31 the exports aggregated 22,191,073 lbs., valued at \$888,891, which compares with 35,242,010 lbs., valued at \$1,663,007 in the corresponding period last year. The decrease this year of 13,050,937 lbs. in quantity and \$774,116 in value is due principally to the curtailed demand in Italy. Of the total shipments this year Italy received 14,479,198 lbs., as against 26,411,551 lbs. in the same 5 months last year; showing a decrease of 11,932,353 lbs., or 46.7 per cent. Shipments to Austria were the second largest, amounting to 3,518,480 lbs., against 3,398,856 lbs. last year; showing an increase of 119,624 lbs. It is interesting to note that Spain imported 33,750 lbs. this year, as against nothing last year. South American countries received 471,307 lbs., the bulk of which was reported by Argentina. Last year the total was 382,850 lbs., showing an increase of 88,457 lbs. in 1902, principally to Argentina.

Quotations per 100 lbs., are as below, unless otherwise specified, for large lots in carboys or bulk (in tank cars), delivered in New York and vicinity.

Blue Vitriol.....	\$4.50@4.62 1/2	Oxalic, com'l.....	\$4.60@5.00
Muriatic, 18 deg.	1.50	Sulphuric, 50 deg.	1.50
Muriatic, 20 deg.	1.62 1/2	bulk, ton.....	13.50@15.50
Muriatic, 22 deg.	1.75	Sulphuric, 60 deg.	1.00
Nitric, 36 deg....	4.00	Sulphuric, 60 deg.,	1.00
Nitric, 38 deg....	4.25	bulk.....	18.00@20.00
Nitric, 40 deg....	4.50	Sulphuric, 66 deg.	1.20
Nitric, 42 deg....	4.87 1/2	Sulphuric, 66 deg.,	1.20
		bulk.....	21.00@23.00

Brimstone.—Exceptionally quiet. Abroad the market has become firmer, owing to advanced freight rates. Consequently shipments to this country hold at \$22.25@22.50 per ton for best unmixed seconds, and \$20.25@20.50 for best thirds. Spot seconds are nominal at \$22.75@23, as there is practically no stock on hand here.

Concerning the Sicilian brimstone market, Messrs. Emil Fog & Sons, of Messina, write us under date May 31 as follows: During May the market was exceedingly quiet and devoid of interest. We notice no improvement in exports to France and Italy, which during April were 9,000 tons less than last year. Demand for the United States was slow, owing to large previous arrivals at New York. The total stock in Sicily is about 250,000 tons, against 190,000 tons last year. Almost the total of this is owned by the Anglo-Sulphur Company; only an insignificant part belongs to dissidents. This shows how entirely the market is under control of that powerful company. Prices are still upheld, without hopes of any reduction for the present, unless it be for a large quantity. To obtain such a reduction the principal exporters and buyers ought to unite and make a low bid, which at this moment has some chance of being accepted. The shareholders of the Anglo-Sulphur Company were called upon to pay in the last instalment of the shares. Evidently the whole capital is now engaged in carrying the immense stock, some 80,000 tons in

excess of last year. End of June begins the new melting, and from August to December 3,000 to 4,000 tons new brimstone will be pouring in daily. This requires large sums of money, and although there cannot be the slightest doubt that they can procure whatever capital may be required, it may be convenient to the Anglo-Sulphur Company to get rid of a large part of its stocks by making a momentary reduction of prices. We quote, f. o. b.: Best unmixed seconds, prompt, 83s. 6d.; September-December, 82s.; best thirds, prompt, 75s. 6d.; September-December, 74s.; refined block sulphur, 85s.; September-December, 83s. 6d.; roll sulphur, in 3 cwt. casks, 95s.; sublimed flowers, pure, in bags, 101s.; sublimed flowers, current, in bags, 93s. 6d. To New York and Portland freight rates are 7s.; Baltimore and Boston, 7s. 3d.; Philadelphia, 7s. 6d.; Baltic ports, 9s.

Pyrites.—Importers report a steady demand. A cargo of 3,500 tons Spanish iron pyrites has come to New York this week for the Pennsylvania Salt Manufacturing Company. This ore will be consumed by the company in the production of its sulphuric acid. At present the ocean freight from Huelva, Spain, to Atlantic ports is 10s. 6d. (\$2.52). This is an advance of over 1s. since early May. Domestic pyrites move regularly on contract. 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 46 to 51 per cent of sulphur; American, from 42 to 44 per cent.

Sulphate of Ammonia.—Gas liquor is easier at \$3.10@3.15 per 100 lbs.

Nitrate of Soda.—The market has stiffened, especially for nearby arrivals, owing to the disasters of two steamers. *Lady Joice*, with 26,000 bags, was wrecked, and so was the *Hero*, with 42,000 bags, both due in July, and causing a heavy loss. The cargoes alone at their market value of say \$2 per 100 lbs., which was recently quoted, means a money loss of nearly \$350,000, while the vessels had a high value. Of course they were fully insured, but it is, nevertheless, very unfortunate for the owners, Messrs. W. R. Grace & Co., as they have lost 3 vessels lately. On the other hand, the quantity of nitrate of soda lost is nearly equal to a month's consumption in this country. Now the expected arrivals in July aggregate only 165,500 bags, which will doubtless be felt and cause firmer prices. Already June-July arrivals are quoted at \$2.05 per 100 lbs., while futures are worth \$1.92 1/2. Spot is held at \$2.10. This week the *Britannia* arrived with 26,442 bags.

The average prices quoted by importers in May were \$2.13 per 100 lbs., for spot, and \$1.95 for future shipments; showing a marked decrease from the 3 previous months, but an increase as compared with last year. In the 5 months ending May 31 spot prices averaged \$2.21, and shipments \$2.04, which compared with the corresponding period last year shows an increase of 38c. in spot and 19c. in shipments. The deliveries at Atlantic ports during the 5 months this year were 51,980 tons, as against 67,237 tons last year, and 50,274 tons in the same period of 1900.

The statistical position of nitrate of soda in Europe is less favorable than a year ago, owing to the smaller consumption initiated by high prices. The imports in the 5 months ending May 31 totaled 545,310 tons, as against 657,040 tons in the corresponding period last year; showing a falling off of 111,730 tons, or 17 per cent. The deliveries this year were 658,320 tons, which is 149,080 tons, or 18 per cent less than 1901. The visible supply on June 1, 1902, was 378,600 tons, as compared with 357,230 tons at the same time last year; showing an increase of 21,370 tons, or 6 per cent.

Concerning the Chilean market, Messrs. Jackson Brothers, of Valparaiso, write us under date of May 17 as follows: There has been a decided collapse in prices during the fortnight, and producers, who were holding out for 6s. 7 1/2d. for 95 per cent at the closing of our last report, have been obliged to accept as low as 6s. 4d. for prompt deliveries. In refined there was a fair inquiry during the early part of the fortnight for May-June delivery at 6s. 9 1/2d. alongside, which also soon subsided; later on 6s. 8 1/2d. alongside was accepted for June delivery, and 6s. 8d. for August, closing with sellers of refined June-December at 6s. 7 1/2d. alongside, and 95 per cent freely offered at 6s. 5d. alongside, any delivery. At a meeting on May 2, the directory of the Asociacion Salitrera fixed the exportation for April-March at 30,500,000 qtls., of which 85 per cent can be exported up to December 31, 1902. The exportation for the first four months of this year has been 9,723,000 qtls., against 8,097,000 qtls. for the same period in 1901, the production 8,430,000 qtls., against 8,266,000 qtls., and the consumption, 13,982,000 qtls., against 17,318,000 qtls., the great falling off in these last figures accounting for the slump we have had in prices. We quote 95 per cent May-June, 6s. 4d.; July-December, 6s. 4 1/2d., and 96 per cent May-June, 6s. 8d.; July-December, 6s. 7d., all ordinary terms sellers. The price of 6s. 4d. with an all round freight of 18s. 9d. stands in 8s. per cwt., net cost and freight, without purchasing commission. Sales during the fortnight were 308,500 qtls., and resales 44,000 qtls.

Potash Salts.—The new price-list has been issued by the German Kali Syndicate, but there is no change from last year. At New York, Boston and Philadelphia the contract prices per 100 lbs. for lots of 50 tons or over are as follows: Muriate of potash, 80@85 per cent, basis 80 per cent, \$1.80; muriate of potash, minimum, 95 per cent, basis 80 per cent, \$1.83; sulphate of potash, 90 per cent, basis 90 per cent, \$2.08; sulphate of potash, minimum 96 per cent, basis 90 per cent, \$2.11; double manure salt, 48@53 per cent, basis 48 per cent, \$1.09; manure salt, minimum 20 per cent potash, 62c. For Norfolk, Va., prices add 2c. per 100 lbs. for muriate of potash, 1 1/2c. for sulphate of potash and 1c. for double manure salt. For Charleston, Savannah, Wilmington, N. C., and New Orleans, La., add 3 1/2c. to the New York prices for muriate of potash, 3c. for sulphate of potash, and 2 1/2c. for double manure salt. For bulk salts on basis of foreign analysis, Kainit testing 12.4 per cent potash is quoted at New York at \$8.80 per long ton, invoice weight at shipping port, or \$9.05 actual weight at receiving port; sylvinit, 38c. per unit of sulphate of potash, invoice weight at shipping port, or 39c. per unit actual weight at receiving port. Kainit prices for Norfolk are 30c. per ton higher than for New York, and at Charleston and other Southern ports 50c. higher, while sylvinit is 1c. per unit higher for Norfolk and 2c. per unit higher for Charleston and other Southern ports. Prices for bulk salts are for quantities not less than 500 tons. Above prices are for river shipment from mines to sea port. For rail shipment from July 1 an additional amount of 40 pf. per 100 lbs., or 5c. per 100 lbs. is required.

Phosphates.—Market conditions are little altered, excepting that ocean freight rates have strengthened. Charters from Fernandina to the United Kingdom are being booked on the basis of 13s. (\$3.12), July sailing, and from Savannah to Germany at 11s. (\$2.64). Abroad sellers of high-grade rock are more anxious to take orders, but buyers are slow in accepting terms. However, a few contracts have been taken at quotations below.

Exports of high-grade Florida rock from Fernandina in May amounted to 14,700 tons, which is somewhat less than the 2 months previous. In the 5 months ending May 31 the total exports were 75,700 tons, as against 65,634 tons last year; showing an increase of 10,066 tons, or 15 per cent.

We quote phosphate prices below:

Phosphates.	Per ton F. o. b.	C. I. F. Un. Kingdom of European Ports.	
		Unit.	Long ton.
*Fla. hard rock (78@80%)	\$6.50@7.00	6 1/4@6 1/2d.	\$9.75@10.53
*Fla. land peb. (68@73%)	3.00@3.25	4 1/2@5d.	6.45@7.00
*Fla. Peace Riv. (58@63%)	2.25@2.50	4 1/2@5d.	5.70@6.00
*Tenn., (78@80%) export.	3.50@3.75	5 1/2@6d.	8.58@9.36
*Tenn., 75% domestic.....	3.00@3.25	.....	.....
*Tenn., 73@74% domestic.....	2.75@3.00	.....	.....
*Tenn., 70@72% domestic.....	2.40	.....	.....
*So. Car. land rock.....	2.10@2.25	.....	.....
*So. Car. river rock.....	3.25	4 1/2@5d.	5.67@6.30
Algerian (63@68%).....	2.75@3.00	.....	.....
Algerian (58@63%).....	.....	5 1/4@6 1/4d.	7.48@8.45
Algerian (53@58%).....	.....	5 1/4@6d.	6.30@7.20
Algerian (53@58%).....	.....	5 @5 1/4d.	5.50@5.78

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

Liverpool. June 11.

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

In spite of the complaints of dull export inquiry for heavy chemicals shipments are on a fairly liberal scale, the following being particulars of exports of bleaching powder and sodas for May as per Board of Trade returns just issued:

Bleaching Powder.—Shipments to United States, 47,195 cwts.; other countries, 27,976 cwts.; total, 75,171 cwts. Soda ash, 105,849 cwts.; caustic soda, 129,629 cwts.; bicarb. soda, 35,270 cwts.; soda crystals, 22,848 cwts.; salt cake, 78,789 cwts.; other sorts, 28,092 cwts.; total, 400,507 cwts.

As compared with May, last year, the exports show a marked increase all round, although it must be borne in mind that shipments for the first 5 months of last year were exceptionally light.

Soda ash is firm at usual quotations as to market. The nearest spot range for tierces may be called about as follows: Leblanc ash, 48 per cent, £5 15s. @ £6; 58 per cent, £6 2s. 6d. @ £6 7s. 6d. per ton, net cash. Ammonia ash, 48 per cent, £4 5s. @ £4 10s.; 58 per cent, £4 10s. @ £4 15s. per ton, net cash. Bags 5s. per ton under price for tierces. Soda crystals are in 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 is in fair demand and steady, as follows: Sixty per cent, £8 15s.; 70 per cent, £9 15s.; 74 per cent, £10 5s.; 76 per cent, £10 10s. per ton, net cash. Bleaching powder is sluggish, but prices are nominally unchanged, at about £6 12s. 6d. @ £6 15s. per ton, net cash for unbarred makes in hardwood packages, with special terms for Continental and a few other export quarters. Chlorate of potash is being shipped to a fair extent against contracts, but there is little fresh business reported, and price remains at 3d. per lb., net cash. Bi-

carb. soda is firm and moving off at £6 15s. per ton, less 2½ per cent for the finest quality in 1 cwt. kegs. with usual allowances for larger packages; also special quotations for a few favored export markets. Sulphate of ammonia is easier at £12 17s. 6d. @ £13 per ton, less 2½ for good gray, 24@25 per cent, in double bags, f. o. b. here, and the stringency seems over for the moment. Nitrate of soda is still drooping, and £9 @ £9 5s. per ton, less 2½ per cent, is now about nearest spot range for double bags, f. o. b. here, as to quality.

METAL MARKET.

New York. June 19

GOLD AND SILVER.

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

Metal	May.		Year.	
	1901.	1902.	1901.	1902.
Gold:				
Exports...	\$10,101,177	\$1,968,407	\$24,144,382	\$20,135,754
Imports...	1,772,834	1,641,044	12,667,226	9,204,551
Excess, E.	\$8,328,343	E. \$327,363	E. \$11,477,156	E. \$10,931,203
Silver:				
Exports...	\$4,381,376	\$3,782,305	\$23,865,067	\$19,284,558
Imports...	2,745,522	2,087,548	13,200,829	10,548,278
Excess, E.	\$1,635,854	E. \$1,694,757	E. \$10,664,238	E. \$8,736,280

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 June 19 and for years from January 1, 1902, 1901 and 1900:

Period.	Gold.		Silver.		Total Excess Exports or Imports.
	Exports.	Imports.	Exports.	Imports.	
Week...	\$12,797	\$14,593	\$244,305	\$122,551	E. \$120,049
1902....	16,485,702	1,309,591	13,583,250	644,464	E. 28,175,157
1901....	24,952,098	1,246,796	15,968,423	1,948,086	E. 87,761,707
1900....	20,480,677	1,446,71	19,202,497	1,302,592	E. 36,334,067

The gold exported this week went chiefly to the West Indies, and the silver to London. Imports were from Central and South America and the West Indies.

Financial Notes of the Week.

General business shows some signs of the approach of summer, and the usual comparative dullness of that season. The speculative markets are quiet and uninteresting. Money is somewhat less freely loaned, and foreign exchange is hardening in a way which suggests possible gold exports before long.

Silver advanced this week owing to the execution of a mint order. The demand in this quarter having been satisfied, the market closes weaker, with the prospect of a small decline from to-day's figures.

The United States Assay Office in New York reports receipts of 89,000 oz. silver for the week.

Exports of merchandise from the United States in May were valued by the Bureau of Statistics of the Treasury Department at \$102,265,588, being less by \$22,302,323 than for May, 1901. For the 11 months of the fiscal year, from July 1 to May 31, the statement is as follows:

	1901.	1902.
Exports	\$1,384,990,728	\$1,292,422,975
Imports	754,767,508	829,952,130
Excess, exports.....	\$630,223,220	\$462,470,845
Add excess of exports, silver.....		19,909,186
Add excess of exports, gold.....		98,637
Total apparent balance.....		\$482,478,668

The gold and silver movement in detail will be found in the usual place, at the head of this column.

The statement of the New York banks, including the 63 banks represented in the Clearing House, for the week ending June 14 gives the following totals, comparison being made with the corresponding weeks of 1901 and 1900:

	1900.	1901.	1902.
Loans and discounts.....	\$809,998,900	\$900,943,900	\$881,070,400
Deposits	895,770,200	984,194,300	942,868,600
Circulation	22,966,600	30,904,400	31,410,800
Specie	168,216,100	177,153,400	172,373,700
Legal tenders.....	73,225,200	77,677,300	76,645,800
Total reserve.....	\$241,441,500	\$254,830,700	\$249,019,500
Legal requirements.....	223,942,550	246,048,575	235,717,150
Balance surplus.....	\$17,498,950	\$8,782,125	\$13,302,350

Changes for the week, this year, were increases of \$158,100 in specie, \$1,101,700 in legal tenders, and \$2,016,775 in surplus reserve; decreases of \$3,196,500 in loans and discounts, \$3,027,900 in deposits, and \$45,600 in circulation.

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

	1901.		1902.	
	Gold.	Silver.	Gold.	Silver.
N. Y. Ad....	\$177,153,400	.....	\$168,216,100	.....
England	185,877,415	.....	189,059,100	.....
France	493,310,375	\$223,584,110	513,214,140	\$224,123,415
Germany	173,430,000	74,330,000	197,195,000	72,935,000
Spain	70,015,000	74,480,000	70,695,000	92,625,000
Neth'l'ds	27,104,000	28,732,500	23,414,500	33,918,500
Belgium	15,230,000	7,615,000	16,600,000	8,300,000
Italy	75,740,000	9,847,000	80,985,000	10,724,000
Russia	354,470,000	36,870,000	372,305,000	45,030,000

The returns of the Associated Banks of New York are of date June 14, and the others June 12, as reported by the *Commercial and Financial Chronicle* cable. The New York banks do not report silver separately, but specie carried is chiefly gold. The Bank of England reports gold only.

Shipments of silver from London to the East for the year up to June 5 are reported by Messrs. Pixley & Abell's circular as follows:

	1901.	1902.	Changes.
India	£3,384,710	£3,317,975	D. £66,735
China	339,125	16,500	D. 322,625
The Straits.....	79,976	70,550	D. 9,426

Totals

Arrivals for the week, this year, were £116,000 in bar silver from New York, £11,000 from Chile, £7,000 from the West Indies, and £5,000 from Australia; total, £139,000. Shipments were £195,250 in bar silver to India, and £7,900 to Hong Kong.

Indian exchange is somewhat firmer, and with a greater demand for Council bills in London, the average price was 15.9d. per rupee. The demand for silver for Indian account has been fair.

Prices of Foreign Coins.

	Bid.	Asked
Mexican dollars.....	\$0.42½	\$0.44
Peruvian soles and Chilean pesos.....	38¾	.42
Victoria sovereigns.....	4.86	4.88
Twenty francs.....	3.86	3.88
Twenty marks.....	4.77	4.85
Spanish 25 pesetas.....	4.78	4.82

OTHER METALS.

Daily Prices of Metals in New York.

June	Silver		Copper		Spelter		Lead	N.Y.	St. L.
	Sterling E. change	N. Y. Cts.	Lake per lb.	Electrolytic per lb.	London Tin, per lb.	N.Y. per lb.				St. L. per lb.
13	4.87½	52	24	12¼ @ 12¼	54¼ 30¼	4.05	4.87½	4.62½	4.62½
14	4.87½	52	24	12¼ @ 12¼	54¼ 30¼	4.05	4.87½	4.62½	4.62½
16	4.87½	52½	24½	12¼ @ 12¼	54¼ 30	4.05	5.00	4.75	4.75
17	4.87½	52¾	24¾	12¼ @ 12¼	54¼ 29¾	4.05	5.00	4.75	4.75
18	4.87½	52¾	24¾	12¼ @ 12¼	53¾ 29	4.05	5.00	4.75	4.75
16	4.87½	52¾	24¾	12¼ @ 12¼	53¾ 28¾	4.10	5.00	4.75	4.75

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 remains dull and featureless. On the one hand there appears to be little new business, and on the other little pressure to sell. Manufacturers continue exceedingly busy, and reports from Europe indicate that larger orders can be expected from that quarter at an early date. We quote Lake copper at 12¼ @ 12½c.; electrolytic copper in cakes, wire bars and ingots at 12 @ 12½c., in cathodes at 11¼ @ 12c.; casting copper at 12c.

The London market for speculative sorts, which closed last Thursday at £54 5s. for spot, £54 7s. 6d. for 3 months, was 5s. higher on Monday, but on Wednesday declined to £53 5s. for spot, £53 10s. for 3 months. On Thursday the closing quotations are cabled as £53 7s. 6d. for spot, £53 12s. 6d. for 3 months.

Statistics for the first half of June show a decrease in the visible supplies of 1,100 tons.

Refined and manufactured sorts we quote: English tough, £57 @ £57 10s.; best selected, £58 @ £59; strong sheets, £68; India sheets, £67; yellow metal, 6¼d. Exports of copper from New York, Philadelphia and Baltimore in the week ending June 18 are reported by our special correspondents as follows: Great Britain, 396 tons; Germany, 300; Holland, 1,912; Austria, 507; Italy, 209; total, 3,324 tons. Imports were 500 tons copper.

Exports of copper from Chile in all forms for the 5 months ending May 31 are reported as equal to 11,943 long tons of fine copper, against 12,352 tons for the corresponding period in 1901; a decrease of 409 tons, or 3.4 per cent.

Copper production, as reported by Mr. John Stanton, who acts as statistician for the producing companies, was as follows, for May, and the five months ending May 31, stated in long tons (2,240 lbs.), of fine copper:

	May		Five Months.	
	1901.	1902.	1901.	1902.
U. S. Reporting Mines.....	18,892	21,761	93,893	95,008
U. S. outside sources.....	3,500	4,000	17,100	18,700
Total, U. S.....	22,392	25,761	110,993	113,708
Foreign Reporting Mines.....	8,456	9,354	38,325	44,344
Total	30,848	35,115	149,318	158,052
Exports from U. S.....	10,062	16,283	58,185	53,939

United States production for May shows an increase of 3,371 tons, or 15.1 per cent; for the 5 months the gain was 2,715 tons, or 2.4 per cent. The large gain in May much more than offset the decrease shown in earlier months of the year. Foreign production for the five months shows an increase of 6,019 tons, or 15.7 per cent. In United States imports there was an increase of 45,754 tons, or 119.8 per cent.

Tin.—In consequence of the decline abroad, buyers here have restricted their purchases to their immediate wants, but their stocks are so low that a fair business has been done. Tin for early delivery remains scarce, owing to which fact our market did not decline to the same extent as that in Europe. At the close we quote spot at 28¾c.; June delivery at 28½c.; July, 28c. The foreign market, which closed last Thursday at £130 10s. for spot, £125 5s. for 3 months, ruled at these figures until Monday, when spot was £130 and 3 months £126. A decline then set in, which brought the market down on Thursday to £126 for spot, £125 for 3 months.

Lead.—The market remains unchanged. We quote 3.97½ @ 4.05c. St. Louis, 4.05 @ 4.10c. New York. The foreign market is again slightly lower, Spanish lead being quoted at £11 3s. 9d. @ £11 5s., English lead 5s. higher.

St. Louis Lead Market.—The John Wahl Commission Company telegraphs us as follows: Lead is dull. Sales of Missouri brands have been made at 3.55 @ 3.97½c., while argentiferous lead brings 4.05c.

Spelter.—The market is strong and active, and higher prices have been paid. There is a strike at the works of some of the smelters, and in consequence production is slightly curtailed. We quote 4¾c. St. Louis, 5c. New York. The foreign market is cabled as being £18 5s. for good ordinaries, £18 7s. 6d. for specials.

St. Louis Spelter Market.—The John Wahl Commission Company telegraphs us as follows: Spelter is strong and higher; the latest sales are on a basis of 4.65c., East St. Louis, and even at this figure there are decidedly more buyers than sellers.

Antimony.—We quote Cookson's at 9¾ @ 10c.; Hallett's at 8¾c.; Italian, Hungarian, Japanese and United States Star at 8c.

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 per oz. in New York. Chemical ware (crucibles and dishes), best hammered metal from store in large quantities, is worth 76c. per gram.

Quicksilver.—The New York price is \$48 per flask for large lots, with a slightly higher figure asked for small orders. In San Francisco quotations are \$45.50 @ \$46.50 for domestic orders, with \$42.50 @ \$43 quoted for export. The London price is £8 15s. per flask, with the same figure quoted from second hands.

Minor Metals and Alloys.—Wholesale prices, f. o. b. works, are as follows:

	Per lb.	Per lb.
Aluminum.....	33 @ 37c.	28c.
No. 1, 99% ingots.....	31 @ 34c.	27c.
No. 2, 90% ingots.....	4c up	25c.
Roller sheets.....	20 @ 25c.	22c.
Alum-bronze.....	33 @ 39c.	32c.
Nickel-alum.....	1.50	1.82
Bismuth.....	80c.	50c.
Chromium, pure (N.Y.).....	50c.	70c.
Copper, red oxide.....	1.25	50c.
Ferro-Molyb'dum (50%).....	90c.	50c.
Ferro-Titanium (10%).....	20 @ 25%, N. Y.).....	62c.
Ferro-Titanium (20 @ 25%, N. Y.).....		

Variations in price depend chiefly on the size of the order.

Average Prices of Metals per lb., New York.

Month.	Tin.		Lead.		Spelter.	
	1902.	1901.	1902.	1901.	1902.	1901.
January	23.54	26.51	4.000	4.350	4.27	4.13
February	24.07	26.98	4.075	4.350	4.15	4.01
March	26.32	26.93	4.075	4.350	4.28	3.91
April	27.77	25.93	4.075	4.350	4.37	3.98
May	29.85	27.12	4.075	4.350	4.47	4.04
June		28.60		4.350		3.99
July		27.85		4.350		3.95
August		26.78		4.350		3.99
September		25.31		4.350		4.08
October		26.62		4.350		4.23
November		26.67		4.350		4.29
December		24.36		4.153		4.31
Year	26.54		4.334		4.08	

Average Prices of Copper.

Table with columns: Month, New York (Electrolytic, Lake, Standard), London. Rows: January to December, Year.

New York prices are in cents, per pound; London prices in pounds sterling, per long ton of 2,240 lbs., standard copper.

Average Prices of Silver, per ounce Troy.

Table with columns: Month, London, N. Y., London, N. Y., London, Y. Y. Rows: January to December, Year.

The New York prices are per fine ounce; the London quotation is per standard ounce, .925 fine.

DIVIDENDS.

Table with columns: Name of Company, Date, Share, Total, Total to Date. Lists various companies and their dividend details.

*Monthly. †Quarterly. §Semi-annual.

ASSESSMENTS.

Table with columns: Name of Company, Location, Delinq., Sale, Amt. Lists companies and their assessment details.

STOCK QUOTATIONS.

NEW YORK.

Table of stock quotations for New York, including columns for Company and Location, and multiple columns for dates (June 12-18) and Sales.

*Per cent.

Coal, Iron and Industrial Stocks.

Table of stock quotations for Coal, Iron and Industrial Stocks, including columns for Company and Location, and multiple columns for dates (June 12-18) and Sales.

Total sales, 253,775 shares. †Ex-dividend

BOSTON, MASS.*

Table of stock quotations for Boston, Mass., including columns for Name of Company, Shares listed, and multiple columns for dates (June 12-18) and Sales.

* Official Quotations Boston Stock Exchange. Holiday. Total sales, 33,959 shares. †Ex-dividend.

PHILADELPHIA, PA. §

Table of stock quotations for Philadelphia, Pa., including columns for Name and Location of Company, and multiple columns for dates (June 12-18) and Sales.

§Reported by Townsend, Whelen & Co., 309 Walnut St., Philadelphia, Pa. Total sales 11,549 shares.

†Ex-privileges.

STOCK QUOTATIONS.

COLORADO SPRINGS, COLO.*

Table of stock quotations for Colorado Springs, Colo. listing companies like Acacia, Alamo, Am. Con., Anaconda, etc., with columns for par value, high/low prices, and sales.

*Colo. Springs Mining Stock Exchange. All mines are in Colorado. Total sales 195,539 shares.

Colorado Springs (By Teleg. Graph.)

Table of stock quotations for Colorado Springs via telegraph, listing companies like Acacia, Alamo, Am. Con., etc., with columns for par value, high/low prices, and sales.

MEXICO.

June 7.

Table of stock quotations for Mexico, listing companies like Durango, Ca. Min. de Penoles, Guanajuato, etc., with columns for shares, last dividend, bid/ask prices, and sales.

ST. LOUIS, MO.* June 16

Table of stock quotations for St. Louis, Mo., listing companies like Am. Nettie, Catherine Lead, Central Coal, etc., with columns for shares, par value, bid/ask prices, and sales.

SPOKANE, WASH.* June 13.

Table of stock quotations for Spokane, Wash., listing companies like American Boy, Pack Tail, Lone Pine-Surp. Con., etc., with columns for par value, high/low prices, and sales.

Total sales 32,500 shares. *Reported by Hunner & Harris.

LONDON.

June 7.

Table of stock quotations for London, listing companies like Anaconda, Coppo, De Lamar, etc., with columns for authorized capital, par value, last dividend, and quotations.

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

PARIS.

May 29.

Table of stock quotations for Paris, listing companies like Acieries de Creusot, Anzin, Boleo, etc., with columns for country, product, capital stock, par value, latest dividend, and prices.

SALT LAKE CITY.* June 14.

Table of stock quotations for Salt Lake City, listing companies like Ajax, Ben Butler, California, etc., with columns for shares, par value, high/low prices, and sales.

TORONTO, ONT. June 16.

Table of stock quotations for Toronto, Ont., listing companies like Ontario, Olive, British Columbia, etc., with columns for par value, high/low prices, and sales.

Total sales, 20,000 shares. †Ex-dividend.

CHEMICALS, MINERALS, RARE EARTHS, ETC. CURRENT WHOLESALE PRICES.

Table with multiple columns listing various chemical and mineral products, their measurements, and prices. Categories include Abrasives, Barium, Barytes, Bauxite, Bismuth, Bitumen, Bone Ash, Borax, Bromine, Cadmium, Calcium, Cement, Ceresine, Chalk, Chlorine, Chrome Ore, Clay, China, Coal Tar Pitch, Cobalt, Copperas, Copper, Cryolite, Explosives, Feldspar, Flint Pebbles, Fluorspar, Fuller's Earth, Graphite, German, Gypsum, Infusorial Earth, Iodine, Iron, Lead, Lime, Magnesite, Magnesium, Manganese, Marble, Mercury, Mica, Mineral Wool, Nickel, Oils, Ozokerite, Paints and Colors, Potash, Potassium, Quartz, Salt, Silica, Silver, Sodium, Sulphate, Sulphur, Talc, Tar, Uranium, Zinc, and Zirconium.

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.